

KS4 CURRICULUM MAPS

CURRICULUM MAP	PAGES
Year 10	1 - 4
Year 11	5 - 8

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Term	NC Topics	RSE	Assessment
	• Cost – Units of data storage: – Bit to Petabyte – Converting data – Data capacity – Binary data – Binary conversions – ASCII – UNICODE – Storing images – Storing sounds – Compression • Lossy • Lossless		
SPRING	1.3 Wired and Wireless Technology – Types of networks – LAN WAN – Factors that affect the performance of networks – 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 LAN • Wireless Access Points • Routers/Switches • NIC • Transmission Media – The internet as a worldwide collection of computer networks: • DNS • Hosting • The Cloud • The concept of virtual networks Network topologies, protocols and layers – Star and Mesh Network Topologies – WIFI – Frequency and channels – Encryption – Ethernet – The uses of IP addressing, MAC addressing, and protocols including: • TCP/IP • HTTP • HTTPS		Starter activities/1 hour for interleaved Algorithm Work in preparation for Component 2 Programming Techniques

Term	NC Topics	RSE	Assessment
	• FTP - POP - IMAP - SMTP - The concept of layers - Packet Switching 1.4 Network Security – Forms of attack: – Malware – Phishing – Brute force – DOS – Data interception – SQL injection – Common prevention methods • Penetration testing • Anti-malware software • Firewalls • User access levels • Passwords • Encryption • Physical security		End of Topic assessment. Starter activities interleaved for Programming Techniques End of Topic assessment.
SUMMER	1.5 Systems software – Operating systems – Purpose and functionality – User interface – Memory management – Peripherals and drivers – User management – File management – Utility software – Encryption software – Defragmentation – Data compression 1.6 Ethics, Cultural, Legal, Environmental – Impacts of digital technology on wider society including:		Starter activities/1 hour for interleaved Algorithm Work in preparation for Component 2 Programming Techniques End of Topic assessment. Starter activities interleaved for Programming Techniques

Term	NC Topics	RSE	Assessment
	• Ethical issues • Legal issues • Cultural issues • Environmental issues • Privacy issues – Legislation relevant to Computer Science: • The Data Protection Act 2018 • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • Software licences (i.e. open source and proprietary)		End of Topic assessment.

Term	NC Topics	Assessment
AUTUMN	Algorithms – Computational Thinking – Abstraction – Decomposition – Algorithmic Thinking – Standard Searching – Algorithms Binary Search – Linear Search – Standard Sorting – Algorithms Bubble Sort • Merge • Sort • Insertion – How to produce Algorithms using Pseudocode – Flow Diagrams – Interpret, Correct or Complete Algorithms Programming Techniques – The use of variables, constants, operators, inputs, outputs and assignments – The use of the three basic programming constructs used to control the flow of a program • Sequence • Selection • Iteration – The use of basic string manipulation • The use of basic file handling operations; • Open • Read • Write • Close – The use of records to store data – The use of SQL to search for data – The use of arrays (or equivalent) when solving problems, including both one- and two-dimensional arrays – How to use sub programs (functions and	Starter activities interleaved to assess K&U. End of topic assessment. Starter activities interleaved to assess K&U. End of topic assessment.

Term	NC Topics	Assessment
	procedures) to produce structured code - The use of data types • Integer • Real • Boolean • Character • String • Casting - The common algorithmic operators - The common Boolean operators Producing Robust Programs • Defensive design considerations - Input sanitisation/Validation - Planning for contingencies • Anticipating Misuse • Authentication • Maintainability • Comments • Indentation – The purpose of testing • Iterative • Final/Terminal - How to identify syntax and logic errors - Selecting and using suitable test data	Starter activities interleaved to assess K&U. End of topic assessment.
SPRING	Computational Logic – Why data is represented in computer systems in binary form – Simple logic diagrams using the operations AND, OR and NOT – Truth tables – Combining Boolean operators using AND, OR and NOT to two levels – Applying logical operators in appropriate truth tables to solve problems – Applying computing-related mathematics + - / * Exponentiation (^) Mod DIV	Ongoing assessment of topics using Past Paper Questions

Term	NC Topics	Assessment
	Translators and facilities of language - Characteristics and purpose of different - levels of programming language, including low level languages - The purpose of translators - The characteristics of an assembler, a compiler and an interpreter - Common tools and facilities available in an integrated development environment (IDE): • Editors • Error Diagnostics • Run-time environment	
SUMMER	Compulsory Programming Unit 20 Hour programming project to assess Unit 2 knowledge and understanding Final Unit 2 Revision of topics based on QLA of topic assessments	20 Hour programming project Past paper Questions Final Examination