

Curriculum Overview Table

Key Stage 3 Computing and ICT

End Point	Key knowledge	Key skills	Key Vocabulary	Reading and Oracy	Numeracy	Common misconceptions
Year 7						
Y7 T1 Safe use of school computer systems	Username and passwords for the school systems. How to use systems safely and appropriately. How email can be used to communicate.	Logging in to various systems. Choosing appropriate passwords. Navigating the computer. Using email. Using google classroom. Using classcharts.	Login, password, online safety, appropriate, risk, prevention	Reading instructions. Scanning the screen to find the required menus, commands and tabs.	The role of numbers in passwords	Switching between case on the keyboard Use of the subject bar in an email
Y7 T1 Computer Components	The role of key computer components and how they work together.	Presentation software skills. Using the school network. Using google classroom.	Input, output, storage, Central Processing Unit, Random Access Memory, Motherboard, component, solid state drive, hard disk drive	Pronouncing the names of the computer components. Speaking about the role of the components.		Where files are stored. USB memory drives are storage and not input devices.
Y7 T2 Scratch Programming	How to code in a visual programming language (Scratch).	Coding in a block programming language. Saving and running code.	Sprite, Stage, programming	Sequencing instructions as part of coding.	Logic and problem solving in coding.	Programming the code onto the stage rather than the sprite.
Y7 T3 Micro Bit Programming	The components of a microbit. How to compile and execute code.	Transferring skills from scratch into microbit block editor. Visual programming skills.	Compile, execute, input, output	Sequencing instructions as part of coding.	Logic and problem solving in coding.	Incorrectly compiling code.
Y7 T4 Introduction to binary	Why computers use binary. About the binary number system.	Converting between binary and denary.	Binary, denary, convert	Reading instructions in lesson. Articulating conversion processes.	Converting between the number systems. Links to how the denary number system works.	Incorrect binary column headings resulting in incorrect conversions.
Y7 T4 Computational thinking	The key computational thinking skills and how they benefit problem solving.	Using the four computational thinking skills. Programming Algorithms	Decomposition, abstraction, algorithm, Pattern recognition	Breaking down text into smaller instructions. Reading logic problems.	Applying computational thinking to maths problems.	How abstraction can assist in real world problems
Y7 T5	The difference between written and visual	Programming in written programming language	Syntax, python shell, IDLE,	Identifying syntax errors in code.	Using numbers and calculations in	The purpose of variables

Introduction to python programming	programming. Python syntax.	(python)	variables, input		code	
Y7 T6 Algorithms and flowcharts	The different ways of representing algorithms	Writing in pseudocode. Creating flowcharts	Flowchart, input, output, decision, terminator, pseudocode, algorithm	Writing clear and concise instructions Breaking down instructions into smaller steps.	Use of calculations in algorithms	Too many arrows coming out of a decision block in a flowchart.
Y7 T6 Software	The different types of software and how the hardware and software in a computer work together.	Software skills as part of work presentation. Using the school computers safely and appropriately.	Operating systems, applications, software, word processing, spreadsheet, browser.	Reading instructions. Learning about the digital tools that can help with spelling and grammar.	Software that can be used to aid numeracy (e.g. spreadsheet, calculator)	Appropriate software for specific purposes (e.g. - the software that is most appropriate for creating a table)
Year 8						
Y8 T1 Ciphers and encryption	What encryption is and how it works. How a range of different ciphers work. Why encryption is important. The history of encryption.	Logical thinking. Problem solving. Decoding. Collaborative working.	Cipher, Encrypt, Decrypt, substitution, enigma.	Communicating with others during collaborative problem solving. Analysing text and looking for patterns.	Investigating numeric ciphers.	Encryption does not prevent the message being opened, it just prevents it being read.
Y8 T2 Programming concepts	The programming constructs of sequence, selection and iteration. The different data types and their use.	Programming using the constructs. Programming different data types	Sequence, selection, iteration. Float, integer, Boolean, string	Identifying and correcting syntax errors	Use of mathematical operators in programming.	Incorrect use of indentation in code
Y8 T2 Presentation software skills	The tools and techniques available in presentation software. How to meet the needs of a specific audience and purpose.	ICT skills in presentation software. Animation, formatting, text manipulation, image manipulation, sound, hyperlinks,transitions.	Animation, formatting, transitions, hyperlinks, audience, purpose.	Use of ICT tools to improve spelling and grammar.	Use of timings as part of animation	Not making best use of the duplicate slide option
Y8 T3 Ethical, Legal, Environmental and Cultural Issues	Ethical, legal, cultural and environmental issues that can arise with the use of technology. The laws that apply to computer use.	ICT skills and software use. Research and image search skills.	Data protection act, computer misuse act and Copyright Designs and Patents	Students write reasoned arguments in relation to the issues raised. Students summarise and evaluate the issues.	Investigating numerical facts such as percentages.	The students' own responsibilities with regards to data protection and computer misuse.
Y8 T4	How spreadsheet software	Using formatting,	Function, formula,	Formula writing	Spreadsheet	Using a calculator rather

Spreadsheet skills	can be used for modelling, calculations and data manipulation.	formulas, functions and graphs in a spreadsheet.	cell, reference, align, sort, filter	and the importance of accuracy	calculations, functions and formulas. Creating graphs.	than formulas.
Y8 T4 Word processing skills	How word processing tools can be used to enhance a document.	Use of word processing tools.	Word processing, formatting, align.	Extended writing in a word processor		Using the space bar to centralise text.
Y8 T5 Python Turtle programming	How subroutines can be used to make programs more efficient. The use of iteration in programming.	Use of python turtle to create patterns and images. Programming skills in particular use of iteration.	Subroutine, iteration, variable, function	Identifying and correcting syntax errors	Use of angles and dimensions in the code that they write.	Saving the file as turtle and then not being able to import the turtle function as a result.
Y8 T6 Combining ICT Skills	How interactivity can be used to enhance a presentation. How previously learnt techniques can be combined to create a product suitable for a specific audience and purpose.	Selecting appropriate images and editing them to fit a purpose. Use of specific search conditions when searching the internet. Presentation software skills.	Hyperlinks, animation, transition, audience, purpose, interactive, slide master	Summarising text. Writing for a given audience and purpose.	Use of timings as part of animation	Placing buttons on the master slide and then finding that they do not work.
Year 9						
Y9 T1 Boolean logic	What logic gates are and their role within circuits and computer systems. AND, OR, NOT gates - what they look like, what they do and real world examples. How Boolean logic can be used in programming.	Creating logic circuits and calculating truth tables. Programming using Boolean operators. Problem solving and logical thinking.	AND, OR, NOT, invert, logic gate, comparison, truth table.	Reading and interpreting examples of Boolean logic in code.	Links to binary. Boolean operators.	Understanding that 1 1 into an OR gate is 1 Not tracking all inputs and outputs in combined gate circuits.
Y9 T2 Representing Algorithms	How the same algorithm can be represented in multiple ways.	Using flowcharts and pseudocode. Programming algorithms	Algorithm, variable, sequence, selection, iteration	The importance of being concise and precise in algorithm writing	Using Boolean logic and mathematical operators in algorithms.	Flowcharts with condition controlled loops
Y9 T3 Programming project	How programming projects are undertaken in the real world. How to test programs. How to plan and design programs.	Students write success criteria, design, develop, test and evaluate a program.	Success criteria, design, development, testing	Creating a written report. Evaluating.	Calculations in programming.	Too much detail in success criteria.
Y9 T4	A range of cyber security threats.	Keeping safe when using technology.	Malware, social engineering,	Reading and comprehension		The meaning of access rights

Cyber security	The potential impact of cyber security breaches and how systems can be best protected in order to prevent attacks.	Identifying risk factors.	phishing, data theft, interception, access rights	tasks. Literacy in phishing emails.		
Y9 T5 Spreadsheet Project: the cost of living	How spreadsheet models can be used. The costs of living as an adult.	Using search criteria on websites to filter results. Use of formulas and functions to create a model.	Formula, conditional formatting, cell reference, model	Reading on websites aimed at adult audiences (rightmove, indeed)	Financial calculations.	The difference between a mortgage and rent.
Y9 T6 Representation of sound and images	How images, sounds and characters are represented on a computer system using binary. About compression and why it is useful for images and sounds.	Using ICT tools to manipulate and create images.	Pixels, amplitude, sound, bit depth, colour depth	Investigating how strings of text are represented on a computer.	Use of binary for image, sound and character representation.	The impact of sampling frequency on file size
Y9 T6 Searching and Sorting Algorithms	The differences between linear and binary search The differences between bubble, insertion and merge sorts	Conducting linear and binary searches. Conducting bubble, insertion and merge sorts	Merge sort, bubble sort, insertion sort, linear search, binary search	Use of alphabetical order in search and sort algorithms	Greater than and less than comparisons in sort algorithms	Finding the midpoint in a binary search

Curriculum Overview Table

GCSE Computer Science

End Point	Key knowledge	Key skills	Key Vocabulary	Reading and Oracy	Numeracy	Common misconceptions
GCSE Computer Science						
Y10 Term 1 1.1 Systems architecture	The purpose of the CPU. Common CPU components and their function. Von Neumann architecture. Embedded systems.	Identifying and describing the CPU components.	CPU, Embedded systems, registers, cache, arithmetic logic unit, program counter, control unit, accumulator. MAR, MDR. Fetch, decode, execute.	Reading instructions. Discussing CPU processes.	Simple computer programs using numbers. Identifying the role of the Arithmetic Logic Unit and Accumulator with numeric examples.	Confusing the role of the MAR and the program counter. Misunderstanding the role of RAM and Cache in the fetch decode execute cycle.
Y10 Term 1 1.2.1 - 1.2.2 Memory and Storage	The need for primary storage. The difference between RAM and ROM. The purpose of ROM and RAM. Virtual memory. The need for secondary storage. Common types of storage. Suitable storage devices and storage media for a given application. The advantages and disadvantages of different storage devices.	Recognise a range of secondary storage devices/media. Differences between each type of storage device/medium. Compare advantages/disadvantages for each storage device. Apply knowledge in context within scenarios	Capacity, Portability, Durability, RAM, ROM, virtual memory, primary, secondary, optical, solid state, magnetic	Guided reading tasks. Exam technique.		Confusing primary and secondary memory.
Y10 Term 1 1.2.3 - 1.2.5 Units and Data representation	The units of data storage. How data needs to be converted into a binary format to be processed by a computer. How binary is used to represent images and sound.	Converting between binary, denary and hexadecimal. Binary Addition and binary shift.	Bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte, binary, hexadecimal	Reading instructions, writing detailed instructions. Articulating conversion processes.	Converting between binary, denary and hexadecimal. Binary addition. File size calculations.	Incorrect file calculations. Thinking hexadecimal F is 16.
Y10 Term 2 2.2 Programming fundamentals	Data types, the 3 basic programming constructs.	Using variables, constants, operators, inputs, outputs and assignments. Using arithmetic and Boolean operators.	Selection, iteration, sequence, integer, float, string, Boolean, count controlled, condition controlled	The importance of correct syntax in programming.	Using arithmetic and Boolean operators in programming.	The importance of changing a condition within a condition controlled loop
Y10 Term 3	Impacts of digital technology	Writing long answer exam	Ethical, legal,	Essay style	Numerical facts to	Misunderstanding the

1.6 Ethical, legal, cultural and environmental impacts of digital technology	on wider society. Legislation relevant to Computer Science. Software licencing The digital divide.	questions. PEEL technique.	legislation, cultural, environmental, privacy, copyright, open source, proprietary.	writing. Using PEEL technique.	do with issues in computing.	concept of “digital divide”
Y10 Term 4 1.5 Systems software	The purpose and functionality of operating systems. The purpose and functionality of utility software	Describing software roles. Evaluating software.	Encryption, defragmentation, compression, interface, peripheral, drivers,	Guided reading. Exam technique. Describing, explaining, evaluating.	File sizes in compression.	Thinking that defragmentation moves “files” rather than fragments.
Y10 Term 5 2.1 Algorithms	Computational thinking principles. Searching and sorting algorithms	Using computational thinking. Designing, creating and refining algorithms Programming skills	Binary search, linear search, bubble sort, merge sort, insertion sort, selection, iteration, sequence.	Clear and concise instruction writing.	Using trace tables with numeric variables Arithmetic operators Boolean operators	How to find the midpoint in binary search How to merge uneven numbers of items
Y10 Term 5 2.5 Programming Languages and Integrated development environments	The characteristics and purpose of different levels of programming languages. High and low level languages. The purpose of translators. The characteristics of a compiler and interpreter.	Evaluating compilers and translators.	Compiler, interpreter, translator, high level, low level, machine code	Evaluating, comparing, describing.	Binary as machine code.	Confusing high and low level languages.
Y10 Term 5 2.2 Programming fundamentals	Data types, the 3 basic programming constructs. How string manipulation works, how sub programs work.	Using variables, constants, operators, inputs, outputs and assignments. Using arithmetic and boolean operators. Programming techniques: string manipulation, file handling, arrays, subprograms	Selection, iteration, sequence, integer, float, string, boolean,	The importance of correct syntax in programming.	Using arithmetic and Boolean operators in programming.	The importance of variables in string manipulation and file handling.
Y10 Term 6 1.3 Computer networks, connections and protocols	Types of network. Network hardware. Factors affecting network performance. Client-server and peer to peer networks. The internet. Star and mesh topologies. Methods of connection. IP and MAC addressing. Standards, protocols and layers.	Creating network diagrams. Identifying performance factors. Describing the different networks.	Star, mesh, topology, WAN, LAN, router, switch, peer to peer, client server, cloud, bandwidth, DNS, wired, wireless	Guided reading tasks. Exam technique.	Numerical formatting of IP and MAC addresses.	Confusing the network protocols
Y11 Term 1 2.4 Boolean logic	The logic gates: AND, OR, NOT. Truth tables for each boolean operator.	Combining the boolean operators. Applying logical operators in truth tables to solve problems.	AND, OR, NOT, Boolean, Logic gate, Truth table.	Deciphering logic expressions	Applying logical operators	The reading of logic expressions

