Curriculum Map – Computer Science – Year 8

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	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Key focus	Unit 7: Layers in Computing	Unit 8: Vector Graphics	Unit 9: EduBlocks	Unit 10: Representations	Unit 11: Mobile App Development	Unit 12: Developing for the Web
Intent	This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system to the physical components that store and execute these programs, to the fundamental binary building blocks that these components consist of.

The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting away the technical details that might confuse or put off learners. | This unit progresses learners' knowledge and understanding of creating vector graphics. Learners may have previously been introduced to vector graphics in the Year 5 'Vector drawing' unit of work. The Year 5 unit introduces learners to working with objects, layers, and grouping.
This unit offers learners the opportunity to design graphics using vector graphic editing software. By the end of the unit learners will have produced an illustration, a logo, or some icons using vector graphics. The lessons are tailored to Inkscape, which is open source and cross-platform, but the resources should be readily adaptable to any vector graphics editor. Vector graphics can be used to design anything from logos and icons to posters, board games, and complex illustrations. Through this unit, learners will be able to better understand the processes involved in creating such graphics and will be provided with the knowledge and tools to create their own. | This unit takes learners from block-based coding to text based. This is in preparation for GCSE and the world of work. Alongside the block-based code there is a translation into Python allowing students to understand High-level language and apply it in a design scenario. Following on from this scheme, students do not return to block-based coding and begin to develop their Python skills learning how to predict, run, modify and make code which is an industry standard approach. | This unit conveys essential knowledge relating to binary representations. The activities gradually introduce learners to binary digits and how they can be used to represent text and numbers. The concepts are linked to practical applications and problems that the learners are familiar with. | This unit progresses students' knowledge and understanding of programming constructs in a block-based programming environment. Learners will also develop their computational thinking and project planning, by going from decomposing a larger project into smaller parts and creating success criteria for the project to getting user feedback and evaluating their projects. | In this unit, learners will explore the technologies that make up the internet and World Wide Web. Starting with an exploration of the building blocks of the World Wide Web, HTML, and CSS, learners will investigate how websites are catalogued and organised for effective retrieval using search engines. By the end of the unit, learners will have a functioning website. |
| **Key knowledge and skills** | • Describe with some detail the architecture of a computer (Von Neumann)
• Explain how programs are run and executed with reference to the RAM, Secondary | • To identify and plan the key requirements for a task relating to a brief.
• Design and explain the process of how to create a graphic with clear markups | • Understanding that coding concepts are not tied to just one language and that skills learnt in one language can be applied to others
• Using testing and debugging routinely as part of their programming | • Convert between different units and multiples of representation size
• Provide examples of the different ways that binary digits are physically represented in digital devices | • Identify when a problem needs to be broken down
• Implement and customise GUI elements to meet the needs of the user
• Use variables in an event-driven programming environment | • Describe what HTML is
• Use HTML to structure static web pages
• Use search technologies effectively
• Discuss the impact of search technologies and the issues that arise by the |

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	• storage and the processor • Use logic gates to construct logic circuits, using AND, NOT & OR and associate these with logical operators and expressions • Provide broad definitions of 'artificial intelligence' and 'machine learning' • Identify examples of artificial intelligence and machine learning in the real world	• Edit and adapt shapes using paths, rotation, modification and colour • Reflect critically on work to improve it and make it the best example	• Providing solutions to given problems and knowing there are different ways to solve it	• Measure the size or length of a sequence of bits as the number of binary digits that it contains	• Use a block-based programming language to include sequencing and selection • Use user input in a block-based programming language • Use variables in a block-based programming language • Evaluate the success of the programming project	• way they function and the way they are used • Create hyperlinks to allow users to navigate between multiple web pages • Implement navigation to complete a functioning website
Key words/ vocabulary	Computer, System, Device, Program, Instructions, Data, Hardware, Processor, Memory, Storage, Communication, Input and output, Architecture, Operating system, Logical operators (NOT, AND, OR) Logical expressions, Truth values (true, false), Truth tables, Logic gates, Logic circuits, Hardware components. Artificial intelligence, Machine learning, Data Training, Testing, Programming	Vector, Fill, Stroke, Rotate, Reposition, Z-order, Layer Handle, Reposition, Path Node, Freehand, Object Logo, Illustration, Icon, Markup Scalable, Bitmap	Sequence, Selection, Iteration, Modules, String, Float, Integer, Function, Sub-routine, Datatypes, Loops	Representations, Symbols, Storage, Communication, Characters, Coding (encoding/decoding), Physical medium, Binary digits, Digital systems, Conversion, Decimal numbers, binary numbers, Representation size, units, multiples, prefixes	Decomposition, mobile, app (application), properties Event-driven programming, variables, sequence, workspace, properties, ids, parameters object properties, object ids, errors, event handler, input, checkbox	HTML, tags, formatting Image, tag, attribute, directory, render CSS, style, formatting, head, body, Search term, keywords, hyperlink, crawler, spider, index, query, ranking Connective, clause, operator, AND, OR, NOT, quote search, website, Navigation
Assessment method	Summative assessment test in the style of a GCSE paper 1 exam, testing students' knowledge and understanding of Systems Architecture	Completed project based on a brief summative test, based on expert vocab covered	Completed program and summative assessment	Puzzle activity that challenges learners to unchain Alan Turing's mug. Summative assessment	Design and build an app Summative assessment	Development of a webpage Summative assessment
Wider links	Designing circuits in tech or science. Applying logic to algorithms to breakdown and abstract problems	Opportunities for numeracy development: Using Vectors to design shapes. Using symmetry to create aesthetically pleasing designs	Lins to art (using turtle to draw) Links to numeracy with use of iterations and angles	Links to WW2 with cryptography and cyphers.	Design skills. Identifying accessibility needs. Working to a brief. Real-world application of an app-designer job	Webpage design, licensing laws, understanding how search engines work.
Enrichment opportunities	Code club	Media committee, graphics competitions	Bebras challenge	Cyberfirst Schools	GoIT challenge	Webpage design competition

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Careers links	Electrician, engineer	Marketing and brand design	Programmer, Games designer, graphic designer, engineer	GCHQ, Cryptologist	App designer. Software engineer, content creator	Web designer, programmer, search engine optimisation specialist