



### Curriculum Intent

Subject: **Computing**

Year: **8**

|          | What?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Why?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | National Curriculum Links                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Term 1-1 | <p><b>Developing for the Web</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                               | <p><b>Prerequisite for Y9 iMedia.</b></p> <p>Programming - Create software to allow computers to solve problems</p> <p>Networks - Understand how networks can be used to retrieve and share information, and how they come with associated risks</p> <p>Creating media - Select and create a range of media including text, images, sounds, and video</p>                                                                                                                                                                                                                                                                                                                                                                                          | <p><b>3.8:</b> create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</p>                                                                                                                                                                                                                                                                                                                                                                                                         |
| Term 1-2 | <p><b>Representations: from Clay to Silicon</b></p> <p>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.</p>                                                                                                                                                                                                                                                                                                                                                                              | <p><b>Prerequisite for Y9 Data Representation topics.</b></p> <p>Data and information - Understand how data is stored, organised, and used to represent real-world artefacts and scenarios</p> <p>Computing systems - Understand what a computer is, and how its constituent parts function together as a whole</p>                                                                                                                                                                                                                                                                                                                                                                                                                                | <p><b>3.6:</b> understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits</p>                                                                                                                                                                                                                                                                                                           |
| Term 2-1 | <p><b>Mobile App Development</b></p> <p>In a world where there's an app for every possible need, this unit aims to take the learners from designer to project manager to developer in order to create their own mobile app. Using App Lab from code.org, learners will familiarise themselves with the coding environment and have an opportunity to build on the programming concepts they used in previous units before undertaking their project. Learners will work in pairs to consider the needs of the user; decompose the project into smaller, more manageable parts; use the pair programming approach to develop their app together; and finish off by evaluating the success of the project against the needs of the user.</p> | <p><b>Prerequisite for Y9 Computer Science programming topics.</b></p> <p>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.</p> <p>Programming - Create software to allow computers to solve problems</p> <p>Effective use of tools - Use software tools to support computing work</p> <p>Design and development - Understand the activities involved in planning, creating, and evaluating computing artefacts</p> | <p><b>3.1:</b> design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p><b>3.2:</b> understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <p><b>3.3:</b> use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data</p> |



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|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Algorithms - Be able to comprehend, design, create, and evaluate algorithms                                                                                                                                                                                                                                                                                                                                                                                                               | structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions<br><br><b>3.8:</b> create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability                                                                                                                                             |
| Term 2-2 | <p><b>Design Vector Graphics</b></p> <p>This unit offers students the opportunity to design graphics using vector graphic editing software. The lessons are tailored to <a href="http://inkscape.org">Inkscape</a> (inkscape.org), which is open source and cross-platform, but the resources should be readily adaptable to any vector graphics editor.</p> <p>Vector graphics can be used to design anything from logos and icons to posters, board games, and complex illustrations. Through this unit, students 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.</p> <p>One of the most interesting and challenging aspects of creating vector graphics is their unlikely link to computational thinking. Creating a complex design is a multi-step process that starts with elementary shapes and involves combining them into more intricate ones using operations such as union, difference, and intersection. There are usually multiple paths to achieving the goal and the process involves decomposition, evaluation, and plenty of inventiveness.</p> <p>This unit progresses students' knowledge and understanding of designing vector graphics.</p> | <p><b>Prerequisite for Y9 iMedia.</b></p> <p>Creating media - Select and create a range of media including text, images, sounds, and video</p> <p>Effective use of tools - Use software tools to support computing work</p> <p>Design and development - Understand the activities involved in planning, creating, and evaluating computing artefacts</p> <p>Data and information - Understand how data is stored, organised, and used to represent real-world artefacts and scenarios</p> | <p><b>3.7:</b> undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</p> <p><b>3.8:</b> create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability</p> |
| Term 3-1 | <p><b>Computing Systems</b></p> <p>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.</p> <p>The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>Computing systems - Understand what a computer is, and how its constituent parts function together as a whole</p> <p>Impact of technology - Understand how individuals, systems, and society as a whole interact with computer systems</p> <p>Programming - Create software to allow computers to solve problems</p>                                                                                                                                                                   | <p><b>3.4:</b> understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]</p>                                                                                              |



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|                 | <p>away the technical details that might confuse or put off learners.</p> <p>The last lessons cover two interesting contemporary topics: artificial intelligence and open source software. These are linked back to the content of the unit, helping learners to both broaden their knowledge and focus on the topics addressed in the unit.</p> <p>The unit assumes no prior knowledge. There are, however, links to the 'Representations' units taught in Years 8 and 9 and the 'Networks' units taught in Years 7 and 8.</p>                                           |                                                                                                                                                                                                                                                                                                           | <p><b>3.5:</b> understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</p> <p><b>3.6:</b> understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>Term 3-3</p> | <p><b>Intro to Python Programming</b></p> <p>This unit introduces learners to text-based programming with Python. The lessons form a journey that starts with simple programs involving input and output, and gradually moves on through arithmetic operations, randomness, selection, and iteration. Emphasis is placed on tackling common misconceptions and elucidating the mechanics of program execution.</p> <p>A range of pedagogical tools is employed throughout the unit, with the most prominent being pair programming, live coding, and worked examples.</p> | <p><b>Prerequisite for Y9 Computer Science programming topics.</b></p> <p>The Year 7 Programming units are a prerequisite for this unit.</p> <p>Programming - Create software to allow computers to solve problems</p> <p>Algorithms - Be able to comprehend, design, create, and evaluate algorithms</p> | <p><b>3.1:</b> design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems</p> <p><b>3.2:</b> understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <p><b>3.3:</b> use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions</p> <p><b>3.6:</b> understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits</p> |