Subject: Computing

	Progress objective 1: Computer Science	Progression Objective2: Information Technology	Progress objective 3 Digital Literacy
Pathway 1	• Understands a recursive solution to a problem repeatedly applies the same solution to smaller instances of the problem. Recognises that some problems share the same characteristics and use the same algorithm to solve both (generalisation). Understands the notion of performance for algorithms and appreciates that some algorithms have different performance characteristics for the same task. • Uses nested selection statements. Appreciates the need for, and writes, custom functions including use of parameters. Knows the difference between, and uses appropriately, procedures and functions. Understands and uses negation with operators. Uses and manipulates one dimensional data structures. Detects and corrects syntactical errors. • Understands how numbers, images, sounds and character sets use the same bit patterns. Performs simple operations using bit patterns e.g. binary addition. Understands the relationship between resolution and colour depth, including the effect on file size. Distinguishes between data used in a simple program (a variable) and the storage structure for that data. • Understands the von Neumann architecture in relation to the fetch-execute cycle, including how data is stored in memory. Understands the basic function and operation of location addressable memory. • Understands that iteration is the repetition of a process such as a loop. (Recognises that different algorithms exist for the same problem. Represents solutions using a structured notation. Can identify similarities and differences in situations and can use these to solve problems (pattern recognition). • Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience of a high-level textual language, including using standard libraries when programming. Uses a range of operators and expressions e.g. Boolean, and applies them in the context of program control. Selects the appropriate data types. • Defines data types: real numbers and Boolean. Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images. Knows that computers transfer data in binary. Understands the relationship between binary and file size (uncompressed). • Recognises and understands the function of the main internal parts of basic computer architecture. Understands the concepts behind the fetch-execute cycle. • Understands how search engines rank search results. Understands how to construct static web pages using HTML and CSS. Understands data transmission between digital computers over networks, including the internet i.e. IP addresses and packet switching.	• Knows the names of hardware e.g. hubs, routers, switches, and the names of protocols e.g. SMTP, iMAP, POP, FTP, TCP/IP, associated with networking computer systems. • Justifies the choice of and independently combines and uses multiple digital devices, internet services and application software to achieve given goals. • Evaluates the trustworthiness of digital content and considers the usability of visual design features when designing and creating digital artefacts for a known audience. Designs criteria for users to evaluate the quality of solutions, uses the feedback from the users to identify improvements and can make appropriate refinements to the solution. • Queries data on one table using a typical query language. • Knows that there is a range of operating systems and application software for the same hardware. • Evaluates the appropriateness of digital devices, internet services and application software to achieve given goals. Designs criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution. • Queries data on one table using a typical query language. • Knows that there is a range of operating systems and application software for the same hardware. • Evaluates the appropriateness of digital devices, internet services and application software to achieve given goals. Designs criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution.	• Uses technologies and online services securely, and knows how to identify and report inappropriate conduct. • Identifies and explains how the use of technology can impact on society. • Recognises ethical issues surrounding the application of information technology beyond school.

KS3 Assessment – Year 8 Progress Grid

	Progress objective 1: Computer Science	Progression Objective2: Information Technology	Progress objective 3 Digital Literacy
Pathway 2	• Shows an awareness of tasks best completed by humans or computers. Designs solutions by decomposing a problem and creates a sub-solution for each of these parts (decomposition). Recognises that different solutions exist for the same problem. • Understands the difference between, and appropriately uses if and if, then and else statements. Uses a variable and relational operators within a loop to govern termination. Designs, writes and debugs modular programs using procedures. Knows that a procedure can be used to hide the detail with sub-solution (procedural abstraction). • Understands why and when computers are used. Understands the main functions of the operating system. • Understands how to effectively use search engines, and knows how search results are selected, including that search engines use 'web crawler programs'.	• Performs more complex searches for information e.g. using Boolean and relational operators. Analyses and evaluates data and information, and recognises that poor quality data leads to unreliable results, and inaccurate conclusions. • Knows the difference between physical, wireless and mobile networks. • Recognises the audience when designing and creating digital content. Uses criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions.	• Makes judgements about digital content when evaluating and repurposing it for a given audience. • Demonstrates responsible use of technologies and online services, and knows a range of ways to report concerns. • Selects, combines and uses internet services. • Understands the potential of information technology for collaboration when computers are networked.
Pathway 3	• Designs solutions (algorithms) that use repetition and two-way selection i.e. if, then and else. Uses diagrams to express solutions. Uses logical reasoning to predict outputs, showing an awareness of inputs. • Creates programs that implement algorithms to achieve given goals. Declares and assigns variables. Uses post-tested loop e.g. 'until', and a sequence of selection statements in programs, including 'and' 'if', then and 'else' statement. • Knows that computers collect data from various input devices, including sensors and application software. Understands the difference between hardware and application software, and their roles within a computer system. • Understands the difference between the internet and internet service e.g. World Wide Web. • Understand (algorithms) that use repetition and two-way selection. • Has knowledge of programs that implement algorithms to achieve given goals. • Knows that computers collect data from various input devices. Understands the difference between hardware and application software. Understands the difference between the internet and internet service e.g. World Wide Web.	• Understands the difference between data and information. Knows why sorting data in a flat file can improve searching for information. Uses filters or can perform single criteria searches for information. • Shows an awareness of, and can use a range of internet services e.g. VOIP. • Collects, organises and presents data and information in digital content. Creates digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging. Makes appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. • Can comment on the difference between data and information. Knows why sorting data in a flat file can improve searching for information. • Is aware of some of the internet services e.g. VOIP. • Has a limited understanding of digital content to achieve a given goal through combining software packages. Can suggest improvements to solutions based on feedback received.	• 0Recognises what is acceptable and unacceptable behaviour when using technologies and online services. • Is aware of what is acceptable and unacceptable behaviour when using technologies and online services.