	Y1	Y2	Y3	Y4	Y5	Y6
Vocabulary	algorithm, computing, instructions, precise, develop, program	logical reasoning, debugging	Repetition, if, then else, output, input, predicts,	Decomposing, sub-solution	Iteration, loop, pattern recognition	nested selection statements procedures functions
Algorithms	Understands what an algorithm is and is able to express simple algorithms symbolically. Understands that computers need precise instructions. Demonstrates care and precision to avoid errors.	Understands that algorithms are implemented on digital devices as programs. Designs simple algorithms Uses logical reasoning to predict outcomes. Detects and corrects errors i.e. debugging, in algorithms.	Design 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.	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. Recognises that different solutions exist for the same problem.	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 a recursive solution to a problem Recognises that some problems share the Same characteristics and use the same algorithm to solve both. Understands the notion of performance for algorithms and appreciates that some algorithms have different performance characteristics for the same task

Programming & Development	Knows that users can develop their own programs, and can demonstrate this by creating a simple program in an environment that does not rely on text e.g. programmable robots, beebots etc.	Executes, checks and changes programs. Understands that programs execute by following precise instructions. Uses logical reasoning to predict the behaviour of programs. Detects and corrects simple semantic errors i.e. debugging, in programs.	Creates programs that implement algorithms to achieve given goals. Uses arithmetic operators, if statements, and loops, within programs.	Understands the difference between, and appropriately uses if and if, then and else statements. Uses a variables within a loop Designs, writes, and debugs programs using procedures.	Understands that programming bridges the gap between algorithmic solutions and computers. Has practical experience and uses a range of operators and applies them in the context of program control. Selects the appropriate data types.	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.
Data & Data Representation	Recognises that digital content can be represented in many forms. Distinguishes between some of these forms and can explain the different ways that they	Recognises different types of data: text, number. Appreciates that programs can work with different types of data.	Understands the difference between data and information. Knows why sorting data in a flat file can improve	Performs more complex searches for information Analyses and evaluates data and information, and recognises that poor quality data	Knows that digital computers use binary to represent all data. Understands how bit patterns represent numbers and images.	Understands how numbers, images, sounds and character sets use the same bit patterns. Performs simple operations using bit

	communicate information.	Recognises that data can be structured in tables to make it useful.	searching for information. Uses filters or can perform single criteria searches for information.	leads to unreliable results, and inaccurate conclusions.	Knows that computers transfer data in binary. Understands the relationship between binary and file size (uncompressed). Defines data types: real numbers and Boolean. Queries data on one table using a typical query language.	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.
Hardware & Processing	Understands that computers have no intelligence and that computers can do nothing unless a program is executed. Recognises that all software executed on digital devices is programmed.	Recognises that a range of digital devices can be considered a computer. Understands how programs specify the function of a general purpose computer.	Recognises and can use a range of input and output devices. Knows that computers collect data from various input devices, including sensors and application software. Understands the difference between hardware and application software, and their	Understands why and when computers are used. Understands the main functions of the operating system. Knows the difference between physical, wireless and mobile networks.	Recognises and understands the function of the main internal parts of basic computer. Understands the concepts behind the fetch-execute cycle. Knows that there is a range of operating systems and application software for the same hardware.	Understands how data is stored in memory. Understands the basic function and operation of location addressable memory

			roles within a computer system.			
Communication & Networks	Obtains content from the world wide web using a web browser. Understands the importance of communicating safely and respectfully online, and the need for keeping personal information private. Knows what to do when concerned about content or being contacted.	Navigates the web and can carry out simple web searches to collect digital content. Demonstrates use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.	Understands the difference between the internet and internet service e.g. world wide web. Shows an awareness of, and can use a range of internet services Recognises what is acceptable and unacceptable behaviour when using technologies and online services	Understands how to effectively use search engines, and knows how search results are selected, including that search engines use 'web crawler programs'. Selects, combines and uses internet services. Demonstrates responsible use of technologies and online services, and knows a range of ways to report concerns	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 associated with networking computer systems. Uses technologies and online services securely, and knows how to identify and report inappropriate conduct.
Information Technology	Uses software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. Understands that people interact with computers. Shares	Uses technology with increasing independence to purposefully organise digital content. Shows an awareness for the quality of digital content collected. Uses a variety of	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	Makes judgements about digital content when evaluating and repurposing it for a given audience. Recognises the audience when designing and creating digital content.	Evaluates the appropriateness of digital devices, internet services and application software to achieve given goals. Recognises ethical issues surrounding the application of information	Justifies the choice of and independently combines and uses multiple digital devices, internet services and application software to achieve given goals. Evaluates the

	their use of technology in school. Knows common uses of information technology beyond the classroom. Talks about their work and makes changes to improve it.	software to manipulate and present digital content: data and information. Shares their experiences of technology in school and beyond the classroom. Talks about their work and makes improvements to solutions based on feedback received.	communicate Makes appropriate improvements to solutions based on feedback received, and can comment on the success.	Understands the potential of information technology for collaboration when computers are networked	technology beyond school. Designs criteria to critically evaluate the quality of solutions, uses the criteria to identify improvements and can make appropriate refinements to the solution.	trustworthiness of digital content and considers the usability of visual design features when designing and creating digital