

Computing			
STEPS	STRAND 1 Computational Thinking, Algorithms & Programming	STRAND 2 Computer Systems	STRAND 3 Digital Literacy
9	All the steps below, and I can also... - analyse and decompose a range of substantial problems. - confidently write efficient code using a range of programming techniques, data structures and recursion in two text-based languages.	All the steps below, and I can also... - explain the Von Neumann Architecture in detail. - explain the features of system software and their use. - describe the OSI network layer model using examples. - give detailed advice on systems and network security.	All the steps below, and I can also... discuss the social, economic, political, legal, ethical and moral effects surrounding the application of current and emerging technology, giving real-world examples.
8	All the steps below, and I can also... - recognise that some problems are unsolvable by computers. - analyse and decompose (break down) a substantial problem. - write algorithms using a flowchart and pseudocode/ERL. - create an accurate algorithm without any help, that meets the requirements of the problem. - develop and refine efficient code using a range of programming techniques in two text-based languages. - systematically resolve errors and build robust programs.	All the steps below, and I can also... - explain the need for and perform data compression. - identify what a relational database is and its benefits. - perform operations using bit patterns. - discuss performance issues of a computer system. - explain Moore's Law. - explain multitasking by computers. - identify and discuss network hardware. - discuss the vulnerabilities and ways to prevent attacks.	All the steps below, and I can also... - understand the ethical issues surrounding the application of information technology. - understand the laws governing the application of information technology, e.g. DPA, CMA, ©, etc.
7	All the steps below, and I can also... - evaluate the effectiveness of algorithms and models for similar problems. - recognise where abstraction (removing unnecessary detail) can be used. - use logical reasoning to explain how an algorithm works. - analyse and decompose (break down) a complex problem. - create an accurate algorithm without any help. - use more than one text-based language. - apply a modular approach to error detection or correction.	All the steps below, and I can also... - understand how and why data types are used. - describe what affects the performance of a computer. - briefly explain the different types of processor. - explain features of operating systems and utilities. - explain that web servers process or store data entered by users. - discuss how topologies affect performance or reliability. - explain the use of most network protocols. - explain layers, virtual networks and packet switching.	All the steps below, and I can also... - effectively design and create digital products for a wider or remote audience. - explain and justify how the use of technology impacts on society, from the perspective of social, economic, political, legal, ethical and moral issues. - recognise that how data can remain on the internet and affect on online identity and privacy.
6	All the steps below, and I can also... - represent algorithms using structured language. - analyse and decompose a more complex problem. - create mostly accurate algorithms with some assistance. - appreciate the effect local and global variables. - confidently use at least one text-based language. - use both pre-tested and post-tested loops. - use a range of systematic tests.	All the steps below, and I can also... - explain how data representation affects data quality. - explain that processors have instruction sets. - explain overflow integers and different types of memory. - explain some features of utility programs. - understand the client-server model. - identify the hardware in wired and wireless networks. - discuss ways system security maybe breached.	All the steps below, and I can also... - undertake creative projects that collect, analyse and evaluate data to meet the needs of a known user group. - consider the properties of media when importing them into digital products. - document user feedback, the improvements identified and the refinements made to the solution. - explain a range of laws and how they can be broken.
5	All the steps below, and I can also... - analyse and decompose (break down) a simple problem. - create an algorithm meeting most of the requirements, with some help. - use procedures and functions appropriately. - write a program in a text-based language. - use and manipulate one-dimensional data structures. - use nested selection statements. - detect and correct syntax errors.	All the steps below, and I can also... - explain how numbers, images, sounds and character sets use the same bit patterns. - understand the relationship between resolution and colour depth and file size. - distinguish between data used in a simple program and the storage structure for that data. - perform simple operations using bit patterns. - understand von Neumann architecture. - explain the hardware needed to setup a network. - identify protocols associated with networks. - discuss ways to keep a network secure.	All the steps below, and I can also... - consider the usability of visual design features when designing and creating digital products for an audience. - evaluate the trustworthiness of digital content. - justify the choice of and independently combine multiple digital devices, internet services and application software to achieve given goals. - design criteria to evaluate the quality of solutions. - use feedback from the users of a solution. - explain how the use of tech can impact on society. - use technologies and online services securely. - identify and report inappropriate conduct.
4	All the steps below, and I can also... - see that different algorithms exist for the same problem. - understand that iteration means repeating a process. - identify similarities and differences to solve problems. - show experience of a high-level text-based language. - select appropriate data types. - use a range of operators and expressions and apply them in the context of program control.	All the steps below, and I can also... - explain that computers use binary to represent all data. - recognise different types of data: real, Boolean - explain how bit patterns represent numbers or images. - recognise the relationship between binary and file size. - understand the concepts behind the fetch-execute cycle. - list hardware needed to connect to a network. - understand data transmission between digital devices. - identify ways to keep a network secure.	All the steps below, and I can also... - evaluate the appropriateness of digital devices, internet services and application software to achieve given goals. - design criteria to evaluate the quality of solutions. - use the criteria to identify improvements. - make appropriate refinements to the solution. - recognise ethical issues surrounding the application of information technology beyond school.
3	All the steps below, and I can also... - see there may be multiple ways to solve a problem. - design solutions by decomposing a problem. - explain that a procedure can be used to hide detail. - write a program using block programming language. - design and write modular programs using procedures. - use a variable and relational operator within a loop to govern termination. - debug modular programs.	All the steps below, and I can also... - analyse and evaluate data and information. - perform more complex searches for information. - recognise the consequences of poor-quality data. - explain how search results are selected. - understand the main functions of the operating system. - select, combine and use internet services. - identify the difference between physical, wireless and mobile networks.	All the steps below, and I can also... - design and create content for a given audience. - evaluate and repurpose content for a given audience. - understand the potential of information technology for collaboration when computers are networked. - use criteria to evaluate the quality of solutions. - identify and make refinements to the solution. - demonstrate responsible use of tech and online services. - identify a range of ways to report concerns.
2	All the steps below, and I can also... - use diagrams to express solutions. - use logical reasoning to predict outputs. - create an algorithm with help that meets some of the requirements of a problem. - declare and assign variables. - write a program with an input. - design algorithms that use repetition (post-tested) loops and two-way selection.	All the steps below, and I can also... - recognise the difference between data and information. - understand why sorting can improve searches. - perform single criteria searches for information. - explain the difference between hardware and software. - explain that computers collect data from various inputs. - understand the difference between the internet and internet service. - show an awareness of or use a range of internet services.	All the steps below, and I can also... - collect, organise and present digital content. - create content for a specific purpose or wider audience. - comment on the success of the solution. - make appropriate improvements, based on feedback. - recognise what is acceptable and unacceptable behaviour when using technologies and online services.
1	I can... - understand that algorithms are implemented as programs. - design simple algorithms using loops and selection. - use logical reasoning to predict outcomes and behaviour. - use arithmetic operators, if statements and loops. - detect and correct simple semantic errors in programs.	I can... - appreciate that programs work with different types of data. - recognise different types of data: text, number. - recognise that data can be structured in tables. - recognise that computers can take different forms. - recognise and use a range of input and output devices. - navigate the web and can carry out simple searches.	I can... - use technology with increasing independence. - use a variety of software to manipulate and present content. - talk about and make improvements, based on feedback. - share experiences of technology in and out of school. - demonstrate the use of computers safely and responsibly. - identify ways to report unacceptable content or contact.