Computing Grade Descriptions

P	I can: • describe main elements of most everyday activities in simple steps. • describe and give simple instructions for a peer to perform a specific task. • use some elements of most commonly used software i.e. word processor or publishing software. • show limited use of a block based programming language. • search for basic information for the situations I am familiar with. • comment on appropriate information for online use. • describe who to contact if I feel I am in danger.
S	I can: • describe everyday activities in simple steps, the description will include some detail of the tasks required. • give basic commands to make things happen. • write simple instructions for sprites to follow. • demonstrate use of basic office software package with some understanding of block based programming language. • identify improvements in my work. • search for simple information from World Wide Web using basic search. • understand what type of information I should or should not post online. • comment on how to use internet safely. • show I know who to contact if I am concerned about my safety online.
1	I can: • draw my own storyboards for everyday activities. • plan and give direct commands to make things happen. • make programmable sprites carry out instructions. • classify items in simple sets of data. • use software under the control of the teacher to create, store and edit digital content using appropriate file and folder names. • understand that people interact with computers. • share my use of technology in school. • understand common uses of information technology beyond the classroom. • talk about my work and make changes to improve it. • obtain content from the World Wide Web using a web browser. • understand the importance of communicating safely and respectfully online, and the need for keeping personal information private. • understand what to do when concerned about content or being contacted.

Computing Grade Descriptions

2	I can: • recognise similarities between storyboards of everyday activities. • plan a linear (non-branching) sequence of instructions. • give a linear sequence of instructions to make things happen. • solve simple problems using programmable sprites. • develop and improve my instructions. • present data in a systematic way. • use technology with increasing independence to purposefully organise digital content. • use a variety of software to manipulate and present digital content: data and information. • share my experiences of technology in school and beyond the classroom. • talk about my work and make improvements to solutions based on feedback received. • show an awareness for the quality of digital content collected. • navigate the web and can carry out simple web searches to collect digital content. • demonstrate use of computers safely and responsibly, knowing a range of ways to report unacceptable content and contact when online.
3	I can: • analyse and represent symbolically a sequence of events. • recognise different types of data: text; number; instruction. • understand the need for care and precision of syntax and typography in giving instructions. • give instructions involving selection and repetition. • 'think through' an algorithm and predict an output. • present data in a structured format suitable for processing. • collect, organise and present data and information in digital content. • create digital content to achieve a given goal through combining software packages and internet services to communicate with a wider audience e.g. blogging. • make appropriate improvements to solutions based on feedback received, and can comment on the success of the solution. • recognise what is acceptable and unacceptable behaviour when using technologies and online services.

Computing Grade Descriptions

4	I can: • partially decompose a problem into its sub-problems and make use of a notation to represent it. • analyse and present an algorithm for a given task. • recognise similarities between simple problems and the commonality in the algorithms used to solve them. • explore the effects of changing the variables in a model or program. • develop, try out and refine sequences of instructions, and show efficiency in framing these instructions. I am able to reflect critically on their programs in order to make improvements in subsequent programming exercises. • make use of procedures without parameters in my programs; I am also able to manipulate strings and select appropriate data types. • design and use simple (1D) data structures. • understand why and when computers are used. • understand the main functions of the operating system. • make judgements about digital content when evaluating and repurposing it for a given audience. I recognise the audience when designing and creating digital content. • use criteria to evaluate the quality of solutions, can identify improvements making some refinements to the solution, and future solutions. • understand how to effectively use search engines, and know how search results are selected, including that search engines use 'web crawler programs'. • select, combine and use internet services. • demonstrate responsible use of technologies and online services, and know a range of ways to report concerns.

Computing Grade Descriptions

5	I can:
	- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. - 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. - 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, using file input / output. - recognise similarities in given simple problems and am able to produce a model which fits some aspects of these problems. - use programming interfaces to make predictions and vary the rules within the programs. I assess the validity of my programs by considering or comparing alternative solutions. - independently write or debug a short program. - make use of procedures with parameters and functions returning values in my programs and am also able to manipulate 1-dimensional arrays. - design and use 2D data structures. - create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability. - use appropriate application software to achieve given goals. - recognise moral, ethical and social issues surrounding the application of information technology beyond school. - design criteria to critically evaluate the quality of solutions, use the criteria to identify improvements and can make appropriate refinements to the solution. - consider the source of digital artefacts and know how to document the sources of artefacts. - understand the reasons for attributing digital artefacts to their owner. - understand how search engines rank search results.

Computing Grade Descriptions

6	I can: • describe more complex algorithms, for example, sorting or searching algorithms. • describe systems and their components using diagrams. • fully decompose a problem into its sub-problems and can make use of a notation to represent it. • describe key algorithms, for example sorting/searching, parity, and am aware of efficiency. • fully decompose a problem into its sub-problems and can make error-free use of an appropriate notation to represent it. • recognise similarities in given more complex problems and am able to produce a model which fits some aspects of these problems. • use pre-constructed modules of code to build a system. • design and use complex data structures including relational databases. • select and use programming tools suited to my work in a variety of contexts, translating specifications expressed in ordinary language into the form required by the system. • consider the benefits and limitations of programming tools and of the results they produce, and I can use these results to inform future judgements about the quality of my programming. • program in a text-based programming language, demonstrating the processes outlined above. I can document and demonstrate that my work is maintainable. I can debug statements. • analyse complex data structures, use them in programs and simplify them. • justify the choice of and independently combine and use multiple digital devices, internet services and application software to achieve given goals. • identify and explain how the use of technology can impact on society. • design criteria for users to evaluate the quality of solutions, use the feedback from the users to identify improvements and can make appropriate refinements to the solution. • use technologies and online services securely, and know how to identify and report inappropriate conduct.

Computing Grade Descriptions

7	I can: • independently select appropriate programming constructs for specific tasks, taking into account ease of use and suitability. • recognise similarities in more complex problems and am able to produce a model that fits most aspects of these problems. • independently write the program for others to use and apply advanced debugging procedures. • analyse, use and simplify complex data structures, for example, normalisation. • demonstrate an understanding of the relationship between complex real life and the algorithm, logic and visualisations associated with programming. • undertake creative projects that collect, analyse, and evaluate data to meet the needs of a known user group. • document user feedback, the improvements identified and the refinements made to the solution. • explain and justify how the use of technology impacts on society, from the perspective of social, economical, political, legal, ethical and moral issues. • effectively design and create digital artefacts for a wider or remote audience. I consider the properties of media when importing them into digital artefacts. • recognise that persistence of data on the internet requires careful protection of online identity and privacy.
8	I can: • recognise similarities between more complex problems, and am able to produce a general model that fits aspects of them all. • competently and confidently use a general-purpose text-based programming language to produce solutions for problems using code efficiently. • understand the ethical issues surrounding the application of information technology, and the existence of legal frameworks governing its use; in particular, the Data Protection Act, Computer Misuse Act, and the Copyright Designs and Patents Act. • understand the concept of intellectual property and the relevant legislation, and its applied use in information technology. • demonstrate that I am a competent e-safety practitioner.

Computing Grade Descriptions

9	I can:
	• evidence a self-conscious and thorough command of the following, evidenced in a scholastic and entirely independent approach to planning, analysis, design, development, implementation, testing and evaluation of solutions to problems.
	• Problem decomposition.
	• Pattern recognition.
	• Pattern abstraction.
	• Algorithm design (full range of alternatives).
	• Development using highly complex & dynamic data structures: multi-dimensional arrays, pointers.
	• Solution development including the selection, justification and use of alternative paradigms (e.g. procedural vs object-oriented methods).
	• Producing highly academic reports including testing, evaluation and conclusion with a complete system of referencing.
	I am a professional, sophisticated and astute IT practitioner.

Computing Grade Descriptions