Progression in Computing

Skills & Knowledge

	Computer Science Knowledge	Computer science Skills
Year 1	Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	Children begin to understand that an algorithm is a precise, step by step instruction used to solve a problem or achieve an objective. Children can use directional language to support their programming. Children can order events to program and debug algorithms. Children can identify that an unexpected outcome is a 'bug' and that these can be debugged using logical steps. Children can begin to predict the outcome of a program by looking at the instructions or code
Year 2		Children understand that an algorithm is a precise, step by step instruction used to solve a problem or achieve an objective. Children are precise when creating an algorithm. Children use their current knowledge and apply logic when creating an algorithm rather than a constant 'trial and error' approach. Children show an understanding of the 'cause and effect' needed for programming. Children can identify that an unexpected outcome is a 'bug' and that these can be debugged using logical steps. Children can predict the outcome of a program by looking at the instructions or code.

	Computer Science Knowledge	Computer science Skills
Year 3	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to	Children can turn a real-life situation into an algorithm by breaking down its component parts. This includes simulating physical systems e.g. speeds and angles. Children can create a sequential algorithm. Children begin to use x,y and 'if' statements. Children begin to use variables and explain their purpose. Children begin to use timings and repeats. Children consistently use their current knowledge and apply logic when creating an algorithm rather than a constant 'trial and error' approach. Children understand 'cause and effect' needed for programming. Children can confidently identify that an unexpected outcome is a 'bug' and that these can be debugged using logical steps. Children can predict the outcome of a program by looking at the instructions or code.
Year 4	explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Children design algorithms for a purpose (e.g. real life situations) Children make more intuitive attempts to debug their own programs. Children's use of programming commands is becoming more logical and deployed with increasing ease. They understand 'if statements' and combine these with variables to achieve a desired outcome. They can use and manipulate the value of variables. Children can make use of user inputs and outputs such as 'print to screen'. They can trace code and use step-through methods to identify errors in code and make logical attempts to correct this. Children can predict the outcome of a an algorithm Children recognise the main component parts of hardware which allow computers to join and form a network.

	Computer Science Knowledge	Computer science Skills
Year 5	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to	Children attempt to turn more complex situations into algorithms for a program by deconstructing it into manageable parts. Children are able identify the approximate cause of any bug but may need some support identifying the specific line of code. Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set. They are beginning to think about their code structure in terms of the ability to debug and interpret the code later. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications based on an audience.
Year 6	explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.	Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. Children test and debug their program as they go. Children logically and systematically test and debug their code. Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions. Children can interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program. Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the internet in school.

	Information Technology Knowledge	Information Technology Skills
Year 1	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Children can login using their own usernames and passwords. Children can save learning into a folder. Children can retrieve learning from a folder Children are becoming familiar with icons such as save, print, open and new.
Year 2		Children can organize their learning in a coherent method to aid in the saving and retrieving of files. Children can use simple databases to analyse information. Children can edit more complex digital data such as music compositions. Children use a range of media, including importing previously created media, for a desired purpose.

	Information Technology Knowledge	Information Technology Skills
Year 3	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select, use and combine a variety of software (including internet services) on a range of digital devices to design	Children can use simple searches to retrieve information and digital content. Children are aware some searches are local to a machine and others take place through the internet. Children can use databases to collect, analyse and evaluate information using a selection of software. Children use appropriate software for appropriate tasks. Children understand and use email attachments.
Year 4	and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level. Children can make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. Children share digital information through appropriate platforms.

	Information Technology Knowledge	Information Technology Skills
Year 5	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	Children search with greater complexity for digital content when using a search engine. They can explain in some detail how credible a webpage is and the information it contains. Children can make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. They objectively review solutions from others. Children can collaboratively create content and solutions using digital features within software. They can use several ways of sharing digital content.
Year 6		Children readily apply filters when searching for digital content. They can explain in detail how credible a webpage is and the information it contains. They compare a range of digital content sources and can rate them in terms of content quality and accuracy. Children use critical thinking skills in everyday use of online communication. Children make clear connections to the audience when designing and creating digital content. The children design and create their own blogs to become a content creator on the internet. They can use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements

	Digital Literacy Knowledge	Digital Literacy Skills
Year 1	Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Children can discuss why their password needs to be kept safe and private. Children can investigate objects to see if they use digital technology outside of school. Children can discuss the steps to take if worried about something online. Children begin to discuss the differences between old and new technology.
Year 2		Children are confident to discuss why their password needs to be kept safe and private. Children know the implications of inappropriate searches. Children can identify different trusted adults who can support them to stay safe online. Children begin to understand how information is shared electronically and the e-safety implications of information sharing. Children show an understanding of e-mail safety and etiquette.

	Digital Literacy Knowledge	Digital Literacy Skills
Year 3	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.	Children are model password security consistently. Children can identify multiple ways to keep themselves safe online e.g. trusted adults, content filters, safe searching techniques. Children demonstrate the importance of having a secure password and not sharing this with anyone else. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Email in Purple Mash. They know more than one way to report unacceptable content and contact
Year 4		Children can explore key concepts relating to online safety. They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact.

	Digital Literacy Knowledge	Digital Literacy Skills
Year 5	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concern about content and contact.	Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.
Year 6		Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking. They recognise the value in preserving their privacy when online for their own and other people's safety.