Computing Progression of Skills

Area	KS1	KS2
Computer Science (CS)	1. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions 2. Create and debug simple programs 3. Use logical reasoning to predict the behaviour of simple programs	4. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 5. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output 6. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 7. Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web 8. Appreciate how [search] results are selected and ranked
Information Technology (IT)	1. Use technology purposefully to create, organise, store, manipulate and retrieve digital content	2. Use search technologies effectively 3. 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
Digital Literacy (DL)	1. Recognise common uses of information technology beyond school 2. 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	3. Understand the opportunities [networks] offer for communication and collaboration 4. Be discerning in evaluating digital content 5. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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	EYFS	KS1	LKS2	UKS2
Computer Science: Algorithms, problem solving and programming	Identify algorithms used in everyday life. Begin to sequence instructions. Recognise, use and understand directional language. Perform a simple program on the floor robot. Recognise that a string of instructions or commands placed together can create a simple program. Record the program used using symbols.	Describe algorithms as sequences of instructions in everyday contexts. Plan a sequence of steps to solve real- life problems. Program floor robots using sequences of instructions (using directional language) to implement an algorithm. Create programs for floor robots and sprites on the screen using a number of steps in order before pressing the Go button. Begin to use conditional language like “if” and “when.” Describe algorithms as sequences of instructions or sets of rules in everyday contexts; understand the importance of order and accuracy of these. Program on screen using sequences of instructions to implement an algorithm. Create programs as sequences of instructions when programming on screen, correcting any errors. Begin to experiment with variables.	Design and write a program using a block language (programs to include movement, dialogue, sound effects, stages, sprites, loops and variables) without user interactions. Use sequence in programs. Write a program to produce output on screen. Explain how loops and random numbers are used in a program. Explain how conditional statements are used in a program. Understand what it means to decompose an algorithm and decompose a program into smaller parts. Design and write a program using a block language to a given brief, including simple interaction (programs to include variables, stages, artificial intelligence and a scoring system). Use sequence and repetition in programs.	Design, write and debug a program using a block language based on their own ideas (programs to include multiple sprites, multiple variables, sensors and conditional statements). Use sequence, selection and repetition in programs. Write a program that accepts keyboard and mouse input and produces output on screen and through speakers. Develop their own simple computer control application. Plan a solution to a problem using decomposition. Design, write and debug a program using a second programming language based on their own ideas (using loops, sprites that move in a variety of ways, allowing them to disappear and appear randomly, manipulate variables and use operators that determine an outcome of a conditional statement). Use sequence, selection, repetition and variables in programs.

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			Write a program that accepts keyboard input and produces on-screen output. Develop their own simulation of a simple physical system on screen.	Write a program that accepts inputs other than keyboard and mouse and produces outputs other than screen or speakers. Design, write and debug their own computer control application. Solve problems using decomposition, tackling each part separately. Understand that coding is the use of programming languages to make games, programs and computers things. Write and adapt programmes using Javascript and Python (print command, run button, input command, random command).
Computer Science: Logical Reasoning	Describe what they think a program will do.	Explain what they think a program will do. Give logical explanations of what a program will do under given circumstances, including some attempt at explaining why it does what it does.	Use logical reasoning to predict outcomes and detect errors in programs. Use and explain a simple, sequence- based algorithm in their own words. Use logical reasoning to detect and correct errors in programs. Explain an algorithm using sequence and repetition	Explain a rule-based algorithm in their own words Use logical reasoning to detect errors in algorithms. Give clear and precise logical explanations of a number of algorithms. Use logical reasoning to detect and correct errors in algorithms (and programs).

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Computer Science Networks and search engines	Know that written information can be shared by email.	Explain and understand how an email is sent.	Understand that email and videoconferencing are made possible through the internet. Use and explain how search engines work. Explain how the internet makes the web possible. Understand that search engines rank pages according to relevance. Create a webpage and explain how web pages are created and transmitted.	Explain how search engines are ranked. Understand how data routing works on the internet. Explain how web pages are created and transmitted in their own words. Understand how mobile phone or other networks operate. Understand how domain names are converted into IP addresses on the internet. Appreciate that search engines rank pages based on the number and quality of in-bound links.
Information Technology Digital Productivity Creating conten	Use digital technology to store and access content with some support. Create content using digital technology. Begin to use a mouse to navigate around a computer screen.	Use digital technology to store and retrieve content. Identify different kinds of content. Create original content using digital technology. Use a mouse to navigate around the computer screen. Store, organise and retrieve content on digital devices for a given purpose. Create and edit original content for a given purpose using digital technology. Present findings using software and interpret the data.	Use a range of programs on a computer. Design and create content on a computer. Collect and present information. Use and combine a range of programs on a computer. Design and create content on a computer in response to a given goal. Collect, analyse and present data.	Use and combine a range of programs on multiple devices. Design and create programs on a computer in response to a given goal. Analyse and evaluate information. Select, use and combine a range of programs on multiple devices. Design and create systems in response to a given goal. Analyse and evaluate data using their chosen software and graphs.

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		Input data accurately and present this information in graphical format.		
Information Technology **Searching**	Understand that information can be found by using a search engine Look for information of interest supported by an adult.	Understand that information can be found by using a search engine. Complete simple searches.	Search for information within a single site. Describe how search engines select pages according to keywords found in the content. Use a standard search engine to find information using a range of strategies to be more successful in finding reliable information.	Use filters to make more effective use of a standard search engine. Understand that search engines use a cached copy of the crawled web to select and rank results. Make use of a range of search engines appropriate to finding information that is required.
Digital Literacy **Digital Citizenship & Technology** **Digital Creativity**	Describe what personal information is. Understand the importance of asking for help from an adult when on the internet. Identify some ways technology is used at home and in school.	Identify what personal information is. Identify what to do if they see disturbing content online at home or at school. Identify ways to keep themselves safe while using digital technology. Understand that information on the internet can be seen by others. Describe some of the risks that occur on the internet. Show an awareness of how IT is used for communication beyond school. Explain what personal information is and develop awareness of why it is special and should not be shared.	Identify who they can trust and share their personal information with online. Use digital technology safely and show respect for others when working online. Identify how to report concerns and inappropriate behaviour in school. Recognise unacceptable behaviour when using digital technology. Decide whether a web page is relevant for a given purpose or question. Use email and videoconferencing in class appropriately.	Demonstrate that they can act responsibly when using the internet. Discuss the consequences of particular behaviours when using digital technology. Know how to report concerns and inappropriate behaviour in a range of contexts. Decide whether digital content is reliable and unbiased. Work collaboratively with peers on a class website or blog. Explain what is meant by copyright Show that they can think through the consequences of their actions when using digital technology. Identify principles underpinning acceptable use of digital technologies.

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		Explain what to do if they have concerns about content or contact online. Keep safe and show respect to others while using digital technology. Identify ways they can use the Internet to communicate with family and friends. Show an awareness of how IT is used for a range of purposes beyond school.	Explain and understand online protocols, in order to stay safe on the web. To identify cyberbullying and its consequences. Identify the risks on online gaming and know how to protect themselves. Demonstrate that they can act responsibly when using computers. Identify and explain the differences between acceptable and unacceptable behaviours when using digital technology. Know who to talk to about concerns and inappropriate behaviour at home or in school. Decide whether digital content is relevant for a given purpose or question. Collaboratively communicate with peers on a shared wiki appropriately. Begin to use a range of online communication tools, such as forums, email and polls in order to formulate, develop and exchange ideas. Describe the meaning of copyright and the importance of acknowledging sources.	Know a range of ways to report concerns and inappropriate behaviour in a variety of contexts. Articulate an opinion about the effectiveness of digital content. Use online tools to plan and carry out a collaborative project successfully.

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