



# Progression of Skills and Knowledge in Computing



## KNOWLEDGE, SKILLS AND UNDERSTANDING

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b><u>Programming</u></b>	<b>Using programmable toys</b>	<b>Programming on screen</b>	<b>Programming an animation</b>	<b>Developing and Producing a simple game</b>	<b>Developing an interactive game</b>	<b>Making a text-based adventure game</b>
	<p>Understand that toys can be controlled by entering a sequence of instructions</p> <p>Develop and record sequences of instructions as an algorithm</p> <p>Program a toy to follow an algorithm</p> <p>Predict how programs will work</p>	<p>Clear understanding of algorithms as sequences of instructions</p> <p>Convert simple algorithms to programs</p> <p>Predict what a simple program will do</p> <p>Spot and fix errors in their program</p>	<p>Create an algorithm for an animated scene in the form of a storyboard</p> <p>Write a program in scratch to create the animation</p> <p>Correct mistakes in their animation program</p>	<p>Develop an educational computer game using selection and repetition</p> <p>Understand and use variables</p> <p>Debug computer programs</p> <p>Recognise the importance of user interface design</p>	<p>Create original artwork and sound for a game</p> <p>Design and create a computer program for a computer game which uses sequence, selection, repetition and variables</p> <p>Use iterative development techniques to improve their game</p>	<p>Learn some of the syntax of a text-based programming language</p> <p>Use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list</p> <p>Plan a text based adventure with multiple 'rooms' and user interaction</p> <p>Thoroughly debug the program</p>
<b><u>Computational Thinking</u></b>	<b>Filming the steps of a recipe</b>	<b>Exploring how computer games work</b>	<b>Finding and correcting bugs in programs</b>	<b>Prototyping an interactive toy</b>	<b>Cracking codes</b>	<b>Mastering algorithms for searching, sorting and mathematics</b>
	<p>Break down a process into simple steps as an algorithm</p> <p>Use different features of a video camera</p> <p>Use a video camera to capture moving images</p> <p>Develop collaborative skills</p> <p>Discuss work and think about how it can be improved</p>	<p>Describe what happens in computer games</p> <p>Use logical reasoning to make predictions on what a program will do</p> <p>Test predictions</p> <p>Think critically about a game</p> <p>Be aware of how to use games safely</p>	<p>Develop strategies for finding errors in programs</p> <p>Build up resilience and strategies for problem solving</p> <p>Increase knowledge and understanding of Scratch</p> <p>Recognise a number of common types of bug in software</p>	<p>Design and make an on screen prototype of a computer controlled toy</p> <p>Understand different forms of input and output</p> <p>Design, write and debug the control and monitoring program for their toy</p>	<p>Be familiar with semaphore and Morse Code</p> <p>Understand the need for private information to be encrypted</p> <p>Encrypt and decrypt messages in simple ciphers</p> <p>Appreciate the need to use complex passwords and to keep them secure</p> <p>Have some understanding of how encryption works on the web</p>	<p>Develop the ability to reason logically about algorithms</p> <p>Understand how some key algorithms can be expressed as programs</p> <p>Understand that some algorithms are more efficient than others for the same problem</p> <p>Understand common algorithms are more efficient than others of the same problems</p> <p>Understand common algorithms for sorting and searching</p> <p>Appreciate algorithmic approaches to problems in mathematics</p>

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<b><u>Creativity</u></b>	<b>Illustrating an eBook</b>	<b>Taking, selecting and editing digital images</b>	<b>Videoing performance</b>	<b>Producing digital music</b>	<b>Fusing geometry and art</b>	<b>Creating short television ads</b>
	<p>Use the web safety to find ideas for an illustration</p> <p>Select and use appropriate painting tools to create and change images on the computer</p> <p>Create an illustration for a particular purpose</p> <p>Know how to save and retrieve and change their work</p> <p>Reflect on work</p>	<p>Consider the technical and artistic merits of photographs</p> <p>Use a digital camera or camera app</p> <p>Take digital photographs</p> <p>Edit and enhance their photographs</p>	<p>Gain skills in shooting live video</p> <p>Edit video clips</p> <p>Understand the qualities of effective video</p>	<p>Use one or more program to edit music</p> <p>Create and develop a musical composition</p> <p>Develop an awareness of how music can enhance work in other media</p>	<p>Develop an appreciation of the links between geometry and art</p> <p>Become familiar with the tools and techniques of a vector graphics program</p> <p>Develop an understanding of turtle graphics</p> <p>Experiment with tools and refine and develop their work</p> <p>Develop awareness of computer generated art</p>	<p>Think critically about how video is used to promote a cause</p> <p>Storyboard an effective advert for a cause</p> <p>Work collaboratively to shoot audible original footage and source additional content, acknowledging intellectual property rights</p> <p>Work collaboratively to edit the assembled content to make an effective advert</p>
<b><u>Computer Networks</u></b>	<b>Finding images using the web</b>	<b>Researching a topic</b>	<b>Making and sharing a short screencast presentation</b>	<b>Editing and Writing HTML</b>	<b>Creating a web page</b>	<b>Exploring computer networks including the internet</b>
	<p>Find and use pictures on the web</p> <p>Know what to do if they find a picture that causes concern</p> <p>Group images based on binary (yes/no)</p> <p>Organise images into two groups</p> <p>Sort images according to a criteria</p> <p>Ask questions about images</p>	<p>Search the internet for information</p> <p>Improve note taking through mapping</p> <p>Develop presentation skills through creating and delivering a short multimedia presentation</p>	<p>Understand the physical hardware connections necessary for computer networks to work</p> <p>Understand some features of internet protocols</p> <p>Understand some diagnostic tools for investigating network connections</p> <p>Develop a basic understanding of how domain names are converted to IP addresses</p>	<p>Understand how the internet makes the web possible</p> <p>Use HTML tags for elementary mark up</p> <p>Use hyperlinks to connect ideas and sources</p> <p>Understand the risks of using the web</p>	<p>Develop research skills to know what information is appropriate</p> <p>Understand some elements of how search engines select and rank ideas</p> <p>Question the plausibility and quality of information</p> <p>Develop and refine ideas and text</p> <p>Show their understanding of safety and responsible use of technology</p>	<p>Appreciate that computer networks transmit and receive information digitally</p> <p>Understand the basic hardware needed for computer networks to work</p> <p>Understand key features of internet communications protocols</p> <p>Develop a basic understanding of how domain names are converted to numerical IP addresses</p>

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<b><u>Communication &amp; Collaboration</u></b>	<b>Producing a talking book</b>	<b>Communication clues</b>	<b>Communicating safely on the internet</b>	<b>Producing a wiki</b>	<b>Sharing experiences and opinions</b>	<b>Create a Yearbook</b>
	<p>Use sound recording to record sounds</p> <p>Develop skills in saving and storing sounds on the computer</p> <p>Understand how a talking book differs from a paper book</p> <p>Share recordings with an audience</p>	<p>Understand that email can be used to communicate</p> <p>Develop skills in opening, composing and sending emails</p> <p>Opening and listening to audio files</p> <p>Use appropriate language in emails</p> <p>Develop skills in editing and formatting text in emails</p> <p>Be aware of e-safety when using email</p>	<p>Develop a basic understand of how email works</p> <p>Gain skills in using email</p> <p>Be aware of issues surrounding emails, including 'netiquette' and safety</p> <p>Work with a remote partner</p> <p>Experience video conferencing</p>	<p>Understand the conventions for collaborative online work, particularly in wikis</p> <p>Become familiar with Wikipedia, including potential problems with its use</p> <p>Use a wiki too to write for a target audience</p>	<p>Become familiar with blogs as a medium and a genre of writing</p> <p>Create a sequence of blog posts on a theme</p> <p>Incorporate additional material in a blog</p> <p>Comment on the posts of others</p> <p>Develop a critical, reflective view of a range of media</p>	<p>Manage or contribute to large collaborative projects, facilitated using online tools</p> <p>Write and review content</p> <p>Source digital media while demonstrating safe, respectful and responsible use</p> <p>Design and produce a high quality a high-quality print document</p>
<b><u>Productivity</u></b>	<b>Creating a card electronically</b>	<b>Recording Bug Hunt data</b>	<b>Collecting and analysing data</b>	<b>Presenting the weather</b>	<b>Creating a virtual space</b>	<b>Using media and mapping to document a trip</b>
	<p>Develop basic keyboard skills through typing and formatting text</p> <p>Develop basic mouse skills</p> <p>Use the web to find and select images</p> <p>Develop skills in storing and retrieving files</p> <p>Develop skills in combining text and images</p>	<p>Sort and classify a group of items by answering questions</p> <p>Collect data using tick charts or tally charts</p> <p>Use simple charting software to produce pictograms and other basic charts</p> <p>Take, edit and enhance photographs</p> <p>Record information on a digital map</p>	<p>Understand some elements of survey design</p> <p>Understand some ethical and legal aspects of online data collection</p> <p>Use the web to facilitate data collection</p> <p>Gain skills in using charts to analyse data</p> <p>Gain skills in interpreting results</p>	<p>Understand different measurements techniques for weather both analogue and digital</p> <p>Use computer based data logging to automate the recording of some weather data</p> <p>Use spread sheets to create charts</p> <p>Analyse data, explore inconsistencies in data and make predictions</p> <p>Practise using presentation software</p>	<p>Understand the work of architects, designers and engineers working in 3D</p> <p>Develop familiarity with a simple CAD tool</p> <p>Develop spatial awareness by exploring and experimenting with a 3D virtual environment</p>	<p>Research a location online using a range of resources appropriately</p> <p>Understand the safe use of mobile technology, including GPS</p> <p>Capture images, audio and video while on location</p> <p>Showcase shared media content through a mapping layer</p>