Grange Primary School

Progression of Skills and Knowledge in Computing

Computer Science **Computing Programme of Study**	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Pupils should be taught to: complete a simple program on a computer.	Pupils should be taught to: 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.		Pupils should be taught to: 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 explain how some simple algorithms work and to detect and correct errors in algorithms and programs select.			
Knowledge	Control a simple program on a computer.	To begin to understand what algorithms are. To begin to understand how algorithms are implemented as programs on digital	To be secure with understanding what algorithms are. To be secure in their understanding of how algorithms are	To begin to solve problems by decomposing them into smaller parts. To begin to use sequence, selection and repetition in programs; work with variables. To begin working with various forms of input and output.	To begin to design, write and debug programs that accomplish specific goals. To begin controlling or simulating physical systems. To begin to solve problems by decomposing them into smaller parts.	To begin to be secure in designing, writing and debugging programs that accomplish specific goals. To begin to be secure in controlling or simulating physical systems. To begin to be secure with solving problems by	To be secure in designing, writing and debugging programs that accomplish specific goals. To be secure with controlling or simulating physical systems. To be secure in solving problems by

		devices; and that programs execute by following precise and unambiguous instructions. To begin creating and debugging simple programs. To start using logical reasoning to predict the behaviour of simple programs.	implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. To be secure in creating and debugging simple programs. To be secure in using logical reasoning to predict the behaviour of simple programs.	To begin to use logical reasoning to explain how some simple algorithms work. To begin using logical reasoning to detect and correct errors in algorithms and programs.	To begin using sequence, selection and repetition in programs; work with variables. To begin working with various forms of input and output. To begin to use logical reasoning to explain how some simple algorithms work. To begin to use logical reasoning to detect and correct errors in algorithms and programs.	decomposing them into smaller parts. To begin to be secure using sequence, selection and repetition in programs; work with variables. To begin to be secure with various forms of input and output. To begin to be secure using logical reasoning to explain how some simple algorithms work. To begin to be secure with logical reasoning to detect and correct errors in algorithms and programs.	decomposing them into smaller parts. To be secure in using sequence, selection and repetition in programs; work with variables. To be secure in working with various forms of input and output. To be secure with using logical reasoning to explain how some simple algorithms work. To be secure in using logical reasoning to detect and correct errors in algorithms and programs.
Skills	-I can program a toy (Bee-Bot) using simple instructions -I understand that I control the programmable toy	-I understand that a programmable toy can be controlled by inputting a sequence of instructions. -I can develop and record	-I have a clear understanding of algorithms as sequences of instructions -I can convert simple	-I can create an algorithm for an animated scene in the form of a storyboard -I can write a program in Scratch to create the animation -I can correct mistakes in animation programs	-I can develop an educational game using selection and repetition -I understand and can use variables -I am beginning to debug computer programs -I can design and make an on-screen prototype	-I can create original artwork and sound for a game -I can design and create a computer program for a computer game, which uses sequence, selection, repetition and variables	-I can learn some of the syntax of a text-based programming language -I can use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list

	-I can use a suitably aged program on a computer effectively	sequences of instructions as an algorithm. -I can program a toy to follow an algorithm -I can debug my programs -I can predict how a program will work -I can break down a process into simple, clear steps, as in an algorithm	algorithms to programs -I can predict what a simple program will do -I can spot and fix debugs in my programs -I can describe what happens in computer games -I can use logical reasoning to make predictions -I can test my predictions	-I can develop a number of strategies for finding errors in programs -I have an increasing knowledge of Scratch -I can recognise a number of common types of bugs in software	of a computer-controlled toy -I understand different forms of input and output -I can design, write and debug the control and monitoring program for my toy -I can use HTML tags for elementary mark up -I can use hyperlinks to connect ideas and sources -I can code up a simple web page with useful content	-I can detect and correct errors in my computer game -I can use iterative development techniques (making and testing a series of small changes) to improve my game -I am familiar with semaphore and Morse code	-I can plan a text-based adventure with multiple 'rooms' and user interaction -I can thoroughly debug the program -I am developing the ability to reason logically about algorithms -I understand how key algorithms can be expressed as programs -I understand that some algorithms are more efficient than others for the same problem -I understand common algorithms for sorting and searching
Vocabulary	Click, On/Off, Up, Down, Space, Left, Right, Clear	Instructions, Input, Sequence	Scratch, Test, Predict, Algorithm, Robot, Debug, Program	Animation, Software. Code	HTML, HTTP, Hyperlink, URL, tag, input, output, simulation, interactive, prototype	Binary Code, Cipher, Decrypt, Encrypt, Morse Code, Semaphore	Python, Variable, Procedure, Syntax, Flowchart, Pseudocode, Linear Search, Random Search, Binary Search, Quicksort, Selection Sort
Information Technology **Computing Programme of Study**	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Pupils should be taught to: use ICT hardware to interact with age-appropriate computer software.	Pupils should be taught to: use technology purposefully to create, organise, store, manipulate and retrieve digital content and recognise common uses of information technology beyond school.		Pupils should be taught to: 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.			

Knowledge	Uses ICT hardware to interact with age-appropriate computer software.	To begin to use technology purposefully to organise, store and retrieve digital content. To begin to recognise common uses of information technology beyond school. To begin using technology purposefully to create and manipulate digital content.	To become secure using technology purposefully to organise, store and retrieve digital content. To become secure with recognising common uses of information technology beyond school. To be secure in using technology purposefully to create and manipulate digital content.	To begin to select, use and combine a variety of software (including internet services) on a range of digital devices. To begin to design and create a range of programs, systems and content that accomplish given goals. To begin collecting, analysing, evaluating and presenting data and information.	Select, use and combine a variety of software (including internet services) on a range of digital devices. Design and create a range of programs, systems and content that accomplish given goals. Collecting, analysing, evaluating and presenting data and information.	To begin to be secure with selecting, using and combining a variety of software (including internet services) on a range of digital devices. To begin to be secure in designing and creating a range of programs, systems and content that accomplish given goals. To begin to be secure in collecting, analysing, evaluating and presenting data and information.	To be secure with selecting, using and combining a variety of software (including internet services) on a range of digital devices. To be secure with designing and creating a range of programs, systems and content that accomplish given goals. To be secure with collecting, analysing, evaluating and presenting data and information.
Skills	-I know how to turn the computer on/off -I can use the mouse effectively to achieve a	-I can use different features of a video camera -I can select and use appropriate tools	-I can use a digital camera or camera app -I can edit and enhance photographs -I can record information	-I am gaining skills in shooting live video, holding the camera steady and reviewing -I can edit videos, add narration and set in/out points -I can search for and evaluate online images	-I can use computer-based data logging to automate the recording of some weather data -I can analyse data, explore inconsistencies and make predictions -I can use one or more programs to edit music	-I am developing my research skills to decide which information is appropriate -I understand some elements of how search engines select and rank results	-I appreciate that computer networks transmit and receive information digitally -I understand the basic hardware needed for computer networks to work

	desired outcome -I am beginning to use the keyboard effectively -I can use age-appropriate software correctly.	-I can use simple sound recording equipment	on a digital map -I can collect data using tick charts or tally charts -I can use simple charting software to produce pictograms and other basic charts		-I can create and develop a musical composition, refining ideas through reflection and discussion -I can research for a purpose	-I am developing a familiarity of a simple CAD (computer aided design) tool -I understand the work of architects and engineers working in 3D -I can explore and experiment with 3D virtual environments, developing my spatial awareness	-I understand key features of internet communication protocols -I can shoot suitable original footage and source additional content, acknowledging intellectual property rights -I understand how domain names are converted to numerical IP addresses
Vocabulary	Mouse, Keyboard, Monitor, Printer, Cursor	Classification Key, Data, Database	Pixel, Picasa, Portfolio, Chart, Classification Key, Data, Database	Internet, The Web,	Data-logging, spreadsheet, sample, software, copyright,	Geometric, Landscape, op art, Symmetry, Tessellations, Screencast, Navigation	Command Prompt, IP address, Packet of Data, Webserver, Domain Name Service (DNS)
Digital Literacy including E-Safety **Computing Programme of Study**	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		Pupils should be taught to: use technology purposefully to create, organise, store, manipulate and retrieve digital content. Pupils should be taught to: 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.		Pupils should be taught to: 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, use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Pupils should be taught to: use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.			

Knowledge		To begin to use technology purposefully to organise, store and retrieve digital content. To begin to use technology safely and respectfully. To begin to keep personal information private. To begin to identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	To become secure in using technology purposefully to organise, store and retrieve digital content. To become secure in using technology safely and respectfully. To become secure in keeping personal information private. To become secure in identifying where to go for help and support when they have concerns about content or contact on the internet or other	To begin to understand computer networks including the internet. To begin to understand how networks can provide multiple services, such as the world wide web. To begin to understand the opportunities networks offer for communication and collaboration. To begin using search technologies effectively. To begin to appreciate how search results are selected and ranked. To begin to use technology safely, respectfully and responsibly. To begin to recognise acceptable/unacceptable behaviour. To begin to know a range of ways to report concerns and inappropriate behaviour.	To develop a deeper understanding of computer networks including the internet. To develop a deeper understanding of how networks can provide multiple services, such as the world wide web. To develop a deeper understanding of the opportunities networks offer for communication and collaboration. To use search technologies more effectively. To develop a deeper appreciation of how search results are selected and ranked. To continue to use technology safely, respectfully and responsibly. To recognise acceptable/unacceptable behaviour. To know a range of ways to report concerns and inappropriate behaviour.	To begin to be secure in understanding computer networks including the internet. To begin to be secure in understanding how networks can provide multiple services, such as the world wide web. To begin to be secure in understanding the opportunities networks offer for communication and collaboration. To begin to be secure in using search technologies effectively. To begin to be secure in appreciating how search results are selected and ranked. To begin to be secure in using technology safely, respectfully and responsibly. To begin to be secure in recognising acceptable/unacceptable behaviour. To begin to be secure in knowing a range of ways	To be secure in understanding computer networks including the internet. To be secure in understanding how networks can provide multiple services, such as the world wide web. To be secure in understanding the opportunities networks offer for communication and collaboration. To be secure in using search technologies effectively. To be secure in appreciating how search results are selected and ranked. To be secure in using technology safely, respectfully and responsibly. To be secure in recognising acceptable/unacceptable behaviour. To be secure in knowing a range of ways to report

			online technologies.	To begin to be discerning in evaluating digital content.	To be more discerning in evaluating digital content.	to report concerns and inappropriate behaviour. To begin to be secure in discerning in evaluating digital content.	concerns and inappropriate behaviour. To be confident in being able to be discerning in evaluating digital content.
Skills		-I am developing my basic keyboard skills -I am developing basic mouse skills -I can combine text and images -I can save and store my work -I can store and retrieve files E-Safety -I can use the web safely to find and use pictures -I know what to do if I encounter pictures that cause concern	-I can edit and format text in emails -I can create and deliver a short multimedia presentation E-Safety -I am aware of how to use games safely and in balance with other activities -I am aware of online safety issues when using email -I can use appropriate language in emails -I can search for information safely	-I can use search engines to learn about a new topic -I can plan, design and deliver an interesting and engaging presentation -I can create my own original images -I can create a video slide cast of a narrated presentation E-Safety -I have a developing understanding of how the internet, web and search engines work -I have a developing understanding of how email works -I am gaining skills in using emails	-I can write for a target audience using a wiki tool -I can use presentation software and video -I can use spreadsheets to create charts E-Safety -I understand some of the risks in using the web -I am becoming familiar with Wikipedia, including potential problems associated with its use -I am aware of the responsibilities when editing other people's work	-I am becoming familiar with blogs as a medium and a genre of writing -I can create a sequence of blog posts on a theme -I can incorporate additional media and comment on the posts of others -I am developing an understanding of turtle graphics -I can experiment with tools available, refining and evaluating as I do -I have an awareness of computer-generated art, in particular fractal-based landscapes E-Safety -I understand the need for private information to be encrypted -I can encrypt and decrypt messages in simple ciphers -I appreciate the need to use complex passwords and to keep them secure	-I can manage or contribute to large collaborative projects, facilitate using online tools -I can write and review content -I can design and produce a high-quality print document -I can showcase shared media content through a mapping layer -I can storyboard an effective advert for a cause E-Safety -I can research a location online using a range of resources appropriately -I understand the safe use of mobile technology, including GPS -I can source digital media while demonstrating safe, respectful and responsible use

						-I have some understanding of how encryption works on the web -I have some understanding of how encryption works on the web -I decide what information is appropriate when researching -I understand how search engines select and rank results -I am continuing to develop my understanding of online safety and responsible uses of technology	
Vocabulary		Text, image, save, find E-Safety	Address, Attachment, Email, Fact File, Evidence, Header, Presentation Google, Search Engine, Research, Password	Slide cast, presentation, Security, Email	Spreadsheets, Wikipedia, Wikipedia's Five Pillars, Reliable, Wiki	Blog, Blogroll, Copyright, Hyperlinks, Podcast. Dashboard Bias, Page Rank, Revision, History	Desktop Publishing (DTP), Typeface, Yearbook, Footage, Final Cut, Creative Commons, Advert, Rough Cut Geotagging, GPS, Tracklog, Smartphone, Metadata

The Early Learning Goal states that by the end of EYFS children can recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.