

Contents

Order	Details	Page
1	Introduction	1
2	Overview of the curriculum	2
3	2 year rolling programme	3
4	Progression of knowledge and skills	4
	Domain 1 - Computer science:	4
	○ Problem solving	4
	○ Programming	6
	○ Logical thinking	8
	○ Wider understanding	9
	Domain 2 - Information technology:	11
	○ Creating content	11
	○ Searching	13
	Domain 3 - Digital literacy:	15
	○ E safety	15
	○ Using IT beyond school	19
5	Appendix 1 – Criteria for evaluation	20
	Appendix 2 – Links with other subjects	20
	Appendix 3 – Glossary	21

1. Introduction

Our computing curriculum through EYFS to Year 6 has been coherently designed to enable pupils to progress their knowledge, understanding and skills in computing. The Computing curriculums: -

- Split into 3 domains – computer science, information technology and digital literacy.
- Each domain, in split into sub strands:
 - computer science – problem solving, programming, logical thinking and wider understanding
 - Information technology – searching and creating content

- Digital literacy – e safety and using IT beyond school
- There is a spiral approach to sequencing the unit and themes recurring year by year. This enables pupils to: -
 - Consolidate technical skills
 - Achieve fluency with a range of key applications
 - Develop their knowledge and understanding of the principles that underpin digital technologies and the changing consequences of these for individuals and society.

2. Overview of the curriculum

Our curriculum is designed around 3 domains: -

Computer science - the study of the numerous processes that interact with different sources of data and information and that can be represented, as a result, in the form of apps, games, software or programs

Pupils learn to program first with Beebots, then ScratchJr, then Scratch and the micro:bit. This takes pupils from a physical manipulative in Key Stage 1, through a pictorial representation of code with ScratchJr to a virtual on screen, manipulative in which text-base programming is made more accessible through a block-based language.

It ensures there is progression through key programming constructs; pupils are introduced to sequence with the Beebot, repetition in ScratchJr, and selection and variable with Scratch and MakeCode for the micro:bit. Pupils develop their computational thinking: the ability to apply programming skills to solve real world problems systematically.

Information technology - the creation, organisation and manipulation of digital content

Pupils acquire skills in using core 'office' applications to work with text, multimedia presentations and data analysis, as well as a competency with digital media from photography and audio to video, animation and virtual reality.

The programme of study for computing at Key Stage 1 requires that pupils be taught to 'use technology purposefully to create, organise, store, manipulate and retrieve digital content'. Our curriculum is designed to enable pupils to do that using text, images, sound and video. Building on this at Key Stage 2, our curriculum enables pupils to 'select, use and combine' a variety of software on a range of devices. Pupils work with both numerical data and information across a range of formats including those that combine both words and images.

Digital literacy – the knowledge, skills and attitudes that allow children to be both safe and empowered in an increasingly digital world. This encompasses their play, participation, socialising, searching and learning through digital technologies

Pupils develop an understanding of how the Internet, the World Wide Web and search engines work, as well as learning how to use these and other technologies safely.

3. 2 year rolling programme

Cycle A						
Term	Autumn		Spring		Summer	
EYFS	Technology is used daily. The children use hardware and age-appropriate software. In free flow learning the children have the opportunity to use interactive whiteboards, desktop computers and ipads. They also use electrical devices, such as cameras and programmable toys, such as Beebots. Children are given opportunities to use ICT to develop skills across the areas of learning.					
Oak Year 1	Solving problems 1.1 – We are treasure hunters	Following steps 1.2 – We are TV chefs	Digital imagery 1.3 – We are digital artists	Publishing 1.4 – We are publishers	Digital audio 1.5 – We are rhythmic	Data analysis 1.6 – We are detectives
Birch Years 2/3/4	Programming 2.1 We are astronauts 3.1 We are programmers 4.1 We are software developers			Debugging 2.2 We are games testers 3.2 We are bug fixes 4.2 We are makers		
Willow Years 4/5/6	Programming 5.1 We are game developers 6.1 We are toy makers		Algorithms 5.2 We are cryptographers 6.2 We are computational thinkers		Digital creation 5.3 We are architects 6.3 We are publishers	
Cycle B						
Term	Autumn		Spring		Summer	
EYFS	Technology is used daily. The children use hardware and age-appropriate software. In free flow learning the children have the opportunity to use interactive whiteboards, desktop computers and ipads. They also use electrical devices, such as cameras and programmable toys, such as Beebots. Children are given opportunities to use ICT to develop skills across the areas of learning.					
Oak Year 1	Solving problems 1.1 – We are treasure hunters	Following steps 1.2 – We are TV chefs	Digital imagery 1.3 – We are digital artists	Publishing 1.4 – We are publishers	Digital audio 1.5 – We are rhythmic	Data analysis 1.6 – We are detectives
Birch 2/3/4	Digital imagery 2.3 We are photographers 3.3 We are presenters		Research and presenting 2.4 We are safe researchers 3.4 We are who we are		Creating images with data 3.6 We are opinion pollsters 4.5 We are artists	
Willow 4/5/6	Internet and social media 5.4 We are web developers 6.4 We are connected		Digital creativity 5.5 We are adventure gamers 6.5 We are advertisers		Future computing 5.6 We are VR designers 6.6 We are AI developers	

Progression of knowledge and skills

Domain: Computer science		
Sub strand: Problem solving		
Understanding what algorithms are	EYFS	Communication, Language and Literacy Understand how to listen carefully and why listening is important.
	Year 1	C.1.1.1. Understand what algorithms are. - Can understand algorithms as sequences of instructions in everyday contexts. - Can take real-world problems and then plan a sequence of steps to solve these. The problems could be moving a Beebot from one point to another, or making some simple food items like a sandwich, smoothie or overnight oats.
	Year 2	C.2.1.1. Understand what algorithms are. - Can understand algorithms as sequences of instructions or sets of rules in everyday contexts. - Can recognise that common sequences of instructions or sets of rules can be thought of as algorithms. Examples could include recipes, but might also be procedures or rules in class, spelling rules, simple arithmetic operations or number patterns.
	Year 3	C.3.1.1. Design, write and debug programs that accomplish specific goals. - Can design and write a program using a block language, without user interaction. - Can create a program for example a scripted animation for a joke, part of a story, or linked to another area of the curriculum. Programs could use pre-built sprites or ones designed by the pupil. - Can create a program that includes movement and dialogue; may also include sound effects and some use of costumes to allow for animated movement. There may be more than one sprite in the animation.
	Year 4	C.4.1.1. Design, write and debug programs that accomplish specific goals. - Can design and write a program using a block language to a given brief, including simple interaction. - Can write a program in Scratch or MakeCode (or similar) in which the user has to provide some input, perhaps as an answer to a question on screen, or by using key presses or the mouse. The program could be a simple game or a set of questions and typed responses.
	Year 5	C.5.1.1. Design, write and debug programs that accomplish specific goals - Can design, write and debug a program using a block language based on their own ideas. - Can design a program of their own and write this in a block-based language such as Scratch. - Can test and debug their code, explain what bugs they found and how they fixed them. The program need not be complex but it should be accomplished with a degree of independent working.
	Year 6	C.6.1.1. Design, write and debug programs that accomplish specific goals.

		• Can design, write and debug a program using a second programming language based on their own ideas. • Can design a program of their own and write this in a programming language other than Scratch (or whichever language has formed the focus for their programming in other years), such as MakeCode. The second language does not need to be text based, but Logo or Python could be used. • Can test and debug their code, explain what bugs they found and how they fixed these. The program need not be complex.
Understanding and controlling algorithms	Year 1	C.1.1.2. Understand how algorithms are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. • Can program floor turtles using sequences of instructions to implement an algorithm. • Can create a Beebot (or similar) program using a number of steps in order before pressing the Go button. The length of the pupil's programs might increase over the year.
	Year 2	C.2.1.2. The pupil can understand how algorithms are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. • Can program on screen using sequences of instructions to implement an algorithm. • Can create programs as sequences of instructions when programming on screen. Their program could be written using simple programming apps (such as ScratchJr), perhaps using pre-prepared blocks and sprites.
	Year 3	C.3.1.2. Controlling or simulating physical systems. • Can explore simulations of physical systems on screen. • Can experiment with some on-screen simulations of physical systems, perhaps linked to topics from other curriculum areas, e.g. a ball bouncing on a bat or a car moving around a track. Many computer games include elements of computer simulations. • Can discuss what they have learned from using the simulation.
	Year 4	C.4.1.2. Controlling or simulating physical systems. • Can develop their own simulation of a simple physical system on screen.
	Year 5	C.5.1.2. Controlling or simulating physical systems. • Can experiment with computer control applications.
	Year 6	C.6.1.2. Controlling or simulating physical systems. • Can design, write and debug their own computer control application.
Algorithms – solving problems	Year 3	C.3.1.3: Solve problems by decomposing them into smaller parts • Can plan a project. • Working with the teacher and, perhaps, other pupils, can develop an outline plan for a project in computing, involving multiple steps and resources, e.g. creating an animation, filming a video or conducting a survey. In video work, the plan

		might include identifying a subject; storyboarding the video; sourcing media; recording video; filming; editing; exporting.
	Year 4	C.4.1.3. Solve problems by decomposing them into smaller parts. • Can work with others to plan a project. • Given a particular project, can work as part of a team to plan how to accomplish their goal, breaking the project down into a set of tasks. Examples of projects could include creating an educational game or monitoring the weather.
	Year 5	C.5.1.3. Solve problems by decomposing them into smaller parts. • Can plan a solution to a problem using decomposition. • Can take a complex problem, identify component parts, use decomposition to break this problem down and then plan how they can solve the problem by working through the elements they have identified. Projects could include developing a computer game, creating a website or designing a building.
	Year 6	C.6.1.3. Solve problems by decomposing them into smaller parts. • Can solve problems using decomposition, tackling each part separately. • Can take a complex problem, identify component parts, use decomposition to break this problem down and then plan how they can solve the problem by working through the elements they have identified. • Can use their plan to solve the original problem.
Sub strand: Programming		
Creating and debugging programs	Year 1	C.1.2.1. Create and debug simple programs. • Can give a sequence of instructions to a floor turtle. • Can create a Beebot program using a sequence of instructions before running it using the Go button. The length of the pupil's programs might be expected to increase over the course of the year.
	Year 2	C.2.2.1. Create and debug simple programs. • Can create a simple program on screen, correcting any errors. • Can create a simple program on screen (e.g. using ScratchJr) with a particular goal or purpose in mind (e.g. moving a sprite from one place to another). • Can debug any errors in their own code.
	Year 3	C.3.2.1. Use sequence, selection and repetition in programs; work with variables. • Can use sequence in programs. • In on-screen programming, can create a program that includes a sequence of commands or blocks in an appropriate order. A typical program could be a simple scripted animation, e.g. telling a joke, a story or explaining an idea taken from elsewhere on the curriculum. The program might include multiple sprites; instructions could include movement, on-screen text, sound and/or costume changes.

	Year 4	C.4.2.1. Use sequence, selection and repetition in programs; work with variables. • Can use sequence and repetition in programs. • Can create a program, typically written in Scratch, or similar, that includes sequences of commands or blocks and some repetition. Repetition would typically be for a fixed number of times, but might also include exit conditions (e.g. repeat...until...). Programs might include simple music or a simple game.
	Year 5	C.5.2.1. Use sequence, selection, and repetition in programs; work with variables. • Can use sequence, selection and repetition in programs. • Can create a program, typically written in Scratch, or similar, that includes sequences of commands or blocks, some repetition and selection. Repetition might include exit conditions (e.g. repeat...until...). Selection would normally be of an if...then or if...then...else type. • Can combine repetition with selection. Programs might include a computer game.
	Year 6	C.6.2.1. Use sequence, selection and repetition in programs; work with variables. • Can use sequence, selection, repetition and variables in programs. • Can create a program that includes sequences of commands or blocks, repetition, selection and variables. Repetition might include exit conditions (e.g. repeat...until...) and perhaps a counter-variable for iteration. Selection would normally be of an if...then or if...then...else type. • Can combine repetition with selection and variables.
Various input and output	Year 3	C.3.2.2. Work with various forms of input and output • Can write a program to produce output on screen. • Can create a program that produces output on screen, such as moving sprites or displayed text, e.g. a simple animation program.
	Year 4	C.4.2.2. Work with various forms of input and output. • Can write a program that accepts keyboard input and produces on-screen output. • In Scratch (or similar), can write a program that displays a question, accepts typed input and responds in an appropriate way to what is typed. This might be used as the basis for a dialogue program or a simple maths game.
	Year 5	C.5.2.2. Work with various forms of input and output. • Can write a program that accepts keyboard and mouse input and produces output on screen and through speakers. • In Scratch (or similar), can create a computer game using the keyboard or mouse for input and the screen and speakers for output.
	Year 6	C.6.2.2. Work with various forms of input and output. • Can write a program that accepts inputs other than keyboard and mouse and produces outputs other than screen or speakers.

Sub strand: Logical thinking		
Using logical thinking to predict	EYFS	Communication Language and Literacy: • Articulate their ideas and thought in well informed sentences • Use talk to help work out problems and organise thinking and activities. • Explain how things work and why they might happen.
	Year 1	C.1.3.1. Use logical reasoning to predict the behaviour of simple programs. • Can give explanations for what they think a program will do. • Can explain to the teacher, and to peers, what they think a program will do. This could be a program they or their peers have written, or it could be a familiar piece of software (including computer games). T • Can use an audio recorder or video camera to capture their explanations.
	Year 2	C.2.3.1. Use logical reasoning to predict the behaviour of simple programs. • Can give logical explanations for what they think a program will do. • Can give logical explanations of what a program will do under given circumstances, including some attempt at explaining why it does what it does. The program could be one they have written or it could be a computer game or a familiar piece of software. • Can use an audio recorder or a video camera to record their explanations.
	Year 3	C.3.3.1. Use logical reasoning to explain how some simple algorithms work. • Can explain a simple, sequence-based algorithm in their own words. • Can give an explanation for a simple algorithm based on a sequence of instructions. The algorithm could be one of their own, or a simple one with which they have been provided. The algorithms could be recorded graphically, e.g. as a storyboard.
	Year 4	C.4.3.1. Use logical reasoning to explain how some simple algorithms work. • Can explain an algorithm using sequence and repetition in their own words. • Given an algorithm using both sequence and repetition, can give a coherent, logically reasoned explanation of what it does and how it works. Repetition is likely to be 'forever' or for a set number of times, although end conditions (e.g. repeat...until...) could be used.
	Year 5	C.5.3.1. Use logical reasoning to explain how some simple algorithms work. • Can explain a rule-based algorithm in their own words. • When provided with a rule-based algorithm (e.g. for a computer game), can explain what it does and how it works, in their own words.
	Year 6	C.6.3.1. Use logical reasoning to explain how some simple algorithms work. • Can give clear and precise logical explanations of a number of algorithms.

		Given an algorithm, can describe what it does and, using logical reasoning, give precise explanations of how it works. Algorithms could be linked to programming projects, but might include a key algorithm such as binary search.
Using logical reasoning to detect and correct errors	Year 3	C.3.3.2. Use logical reasoning to detect and correct errors in algorithms and programs. - Can use logical reasoning to detect errors in programs. - Can give well-thought-through reasons for errors they find in programs. - Can find errors by reasoning logically about the program code, and may also be able to use logical reasoning to identify errors in programs when they are executed. The programs do not have to be written originally by the pupil.
	Year 4	C.4.3.2. Use logical reasoning to detect and correct errors in algorithms and programs. - Can use logical reasoning to detect and correct errors in programs. - Can give well-thought-through reasons for errors they find in programs and explain how they have fixed these. - Can find and correct errors by reasoning logically about the program code; they might also be able to use logical reasoning to identify errors in programs when executed and confirm that they have fixed these by testing the new version of their program. The programs do not have to be written originally by the pupil.
	Year 5	C.5.3.2. Use logical reasoning to detect and correct errors in algorithms and programs. - Can use logical reasoning to detect errors in algorithms. - When given an algorithm for a particular purpose, e.g. a rule-based algorithm for a computer game or a sequence of steps to draw a geometric pattern, can use logical reasoning to identify possible errors in the algorithm, explaining why they believe the algorithm is incorrect
	Year 6	C.6.3.2. Use logical reasoning to detect and correct errors in algorithms and programs. - Can use logical reasoning to detect and correct errors in algorithms (and programs). - When given an algorithm for a particular purpose, e.g. a rule-based algorithm for a smartphone app, can use logical reasoning to identify possible errors in the algorithm, explaining why they believe the algorithm is incorrect. - Can use logical reasoning to suggest possible corrections to the algorithm, explaining why these would correct the bug they identified.
Sub strand: Wider understanding		
Understanding computer networks	Year 3	C.3.3.3. Understand computer networks including the Internet. - Can understand that computer networks transmit information in a digital (binary) format. - Can explain that any information has to be converted to numbers before it can travel through computer networks. - Can understand that this conversion happens according to an agreed system or code.
	Year 4	C.4.3.3. Understand computer networks including the Internet. - Can understand that the Internet transmits information as packets of data. - When working online, can explain that the information they send and receive is automatically broken down into

		packets of data, and that these sometimes take different routes across the Internet.
	Year 5	C.5.3.3. Understand computer networks including the Internet. • Can understand how data routing works on the Internet. • Can give a coherent explanation of how data packets are routed from one computer to another on a separate network, which is also connected to the Internet.
	Year 6	C.6.3.3. Understand computer networks including the Internet. • Can understand how mobile phone or other networks operate. • Can give an explanation of how networks operate: they should know that information is transmitted digitally, and have some understanding of the network topology involved.
Networks provide multiple services	Year 3	C.3.4.1. Understand how networks can provide multiple services, such as the World Wide Web. • Can understand that email and videoconferencing are made possible through the Internet. • Knows that email messages are sent and received through servers connected to the Internet. • Knows that other systems also work through the Internet, but these services may be direct, peer-to-peer connections rather than via servers.
	Year 4	C.4.4.1. Understand how networks can provide multiple services, such as the World Wide Web. • Can understand how the Internet makes the web possible. • Can give an explanation of how requests for web pages, and the HTML for those pages, are transmitted via the Internet
	Year 5	C.5.4.1. Understand how networks can provide multiple services, such as the World Wide Web. • Can understand how web pages are created and transmitted. • Can explain how HTML is used to create a web page and how it is transmitted as packets of digital data over the Internet. • Has an awareness of simple HTML tags for marking up a web page.
	Year 6	C.6.4.1. Understand how networks can provide multiple services, such as the World Wide Web. • Can understand how domain names are converted into IP addresses on the Internet. • Can give some explanation of how a domain name is converted into an IP address using the distributed domain name system (DNS) using something similar to a set of phone books. • Has an awareness of the looked-up addresses (DNS records) being copied (cached), and that more local records are used in preference to more authoritative records in most circumstances.

Domain: Information technology		
Sub strand: Creating content		
Using technology to organise, store and retrieve digital content	EYFS	Expressive Arts and Design: • Make use of props and materials (including digital cameras, ipads etc) • Explore, use and refine a variety of artistic effects to express their ideas and feelings (ipads)
	Year 1	C.1.1.1. Use technology purposefully to organise, store and retrieve digital content. • Can use digital technology to store and retrieve content. • Can use a range of digital technologies to store and access digital content. These might include laptop computers, tablets, smartphones, digital cameras, video cameras and audio recorders. Projects might include videoing one another cooking, developing an eBook or an audiobook, creating a greetings card.
	Year 2	C.2.1.1. Use technology purposefully to organise, store and retrieve digital content. • Can store, organise and retrieve content on digital devices for a given purpose. • With a given purpose, can use a range of digital technologies to retrieve, organise and store digital content. Technologies will typically include laptop computers, tablets and smartphones with access to the Internet. • Can use digital cameras, video cameras and audio recorders (or the equivalent apps on a tablet or smartphone). Projects might include digital photography, searching for images online and creating image-based presentation slides.
	Year 3	C.3.1.1. Select, use and combine a variety of software (including Internet services) on a range of digital devices • Can use a range of programs on a computer. • Can use a range of software on laptop or tablet computers with some degree of independence. Software might include video editing, diagnostic tools, email clients, videoconferencing (with the teacher or another adult), survey design software, spreadsheets and presentation software.
	Year 4	C.4.1.1. Select, use and combine a variety of software (including Internet services) on a range of digital devices. • Can use and combine a range of programs on a computer. • Can use multiple programs on laptop or tablet computers to achieve particular goals. For example, they might record audio and then use this as samples in a composition; create HTML content in a text editor and preview it in a browser; analyse data in a spreadsheet and then create a presentation to show the results of their analysis.
	Year 5	C.5.1.1. Select, use and combine a variety of software (including Internet services) on a range of digital devices. • Can use and combine a range of programs on multiple devices. • Can use multiple digital devices (such as tablets and laptops or digital cameras and laptops) to achieve particular goals. The devices might include web servers, allowing them to use cloud-based applications. For example, they might use local media in conjunction with a cloud-based programming platform, such as Scratch; digital cameras and video cameras to capture content to use on an externally hosted website or blog; a digital camera to take photos they could import into 3D design software on a laptop.

	Year 6	C.6.1.1. Select, use and combine a variety of software (including Internet services) on a range of digital devices. • Can select, use and combine a range of programs on multiple devices. • Can choose for themselves from a range of available programs on laptops, tablets or cloud-based services to achieve particular goals. For example, they might choose which image editors and presentation software to use when making a presentation; which image and audio editors to use when creating media content for an app; which DTP, video editor and website tools to use when developing marking materials for an app.
Using technology to create and manipulate digital content	Year 1	C.1.1.2. Use technology purposefully to create and manipulate digital content. • Can create original content using digital technology. • Can create their own original digital content using a range of technologies. These might include laptop computers, tablets, smartphones, digital cameras, video cameras and audio recorders. Projects might include videoing one another cooking, developing an eBook or an audiobook, creating a greetings card. Look for some indication of the pupil's creativity in this work.
	Year 2	C.2.1.2. Use technology purposefully to create and manipulate digital content. • Can create and edit original content for a given purpose using digital technology. • Can create and edit their own original digital content using a range of technologies. Content-creation technology might include laptop computers, tablets, smartphones with network connections, digital cameras, video cameras and audio recorders, although editing is likely to take place on laptops or tablets. Projects might include digital photography, creating image-based presentation slides, composing an email and creating simple charts. Look for some indication of the pupil's creativity in this work and evidence that they have edited content.
	Year 3	C.3.1.2. Design and create a range of programs, systems and content that accomplish given goals. • Can design and create content on a computer. • Can plan and execute a project in which they use software on a laptop or tablet to create digital content with some degree of independence. For example, they could plan and shoot a video, plan and create a presentation on a given topic or plan and then create an online survey.
	Year 4	C.4.1.2. Design and create a range of programs, systems and content that accomplish given goals. • Can design and create content on a computer in response to a given goal. • With a given goal, can plan and execute a project in which they use software on a laptop or tablet to create digital content with some degree of independence. For example, they could plan and compose original music using sequencing software; plan and create a web page; plan how they could contribute to a shared wiki and then do so; plan and create a presentation about the weather. • Evaluate how effectively they have met the requirements of the original goal.
	Year 5	C.5.1.2. Design and create a range of programs, systems and content that accomplish given goals. • Can design and create programs on a computer in response to a given goal.

		Can design a program of their own in response to a given goal and write this in a block-based language such as Scratch. The program need not be complex - a simple game would suffice, but it should be accomplished with a degree of independent working.
	Year 6	C.6.1.2. Design and create a range of programs, systems and content that accomplish given goals. - Can design and create systems in response to a given goal. - Can plan, design and implement a system with multiple, interrelated components with a given goal in mind.
Collecting, analysis, evaluating and presenting data and information	Year 3	C.3.1.3. Collecting, analysing, evaluating and presenting data and information. - Can collect and present information. - Can use computers to collect information and present this to an audience. For example, they could shoot and then show a video or conduct an online survey and present the results. They should be able to do this with a degree of independence.
	Year 4	C.4.1.3. Collecting, analysing, evaluating and presenting data and information. - Can collect and present data. - Can use computers to collect numerical data and present this to an audience. For example, they could collect and present data about the weather over a period of time. They should be able to do this with a degree of independence.
	Year 5	C.5.1.3. Collecting, analysing, evaluating and presenting data and information. - Can analyse and evaluate information. - Working with text, audio, images or video, can analyse information, perhaps summarising this. - Evaluate the quality of the information, looking for bias or questioning assumptions that have been made. For example, they could work with information on e-safety, evaluating its quality and providing a clear and coherent summary.
	Year 6	C.6.1.3. Collecting, analysing, evaluating and presenting data and information. - Can analyse and evaluate data. - Can evaluate the quality of numerical data, deciding the extent to which it is affected by systematic or random errors - Can analyse their data, perhaps producing summary statistics, looking for relationships, trends and exceptions.
Sub strand: Searching		
Using digital technology	Year 3	C.3.2.1. Use search technologies effectively. - Can search for information within a single site. - Can use browser-specific tools (e.g. the Find command) and site-specific tools (such as the search tools for Wikipedia or YouTube) to locate particular information on a web page or within a website.
	Year 4	C.4.2.1. Use search technologies effectively. - Can use a standard search engine to find information. - Can use a common search engine (such as Google with safe search mode locked in place) effectively, to search for

		particular information on the web, such as answers to questions they identify in a research project.
	Year 5	C.5.2.1. Use search technologies effectively. • Can use filters to make more effective use of a standard search engine. • Can use a common search engine (such as Google with safe search mode locked in place) effectively, to search for particular information on the web, such as answers to questions they identify in a research project. • Can use built-in search tools to filter their results, such as by time, location or reading level.
	Year 6	C.6.2.1. Use search technologies effectively. • Can make use of a range of search engines appropriate to finding information that is required. • Can show that they can use effectively a range of different search technologies, including alternatives to Google (such as Bing or Yahoo) and site-specific search engines (such as those for the App Store or Google Play). E.g. • Can demonstrate how they would use a range of search engines when researching available smartphone apps for a particular purpose.
How search results are selected and ranked.	Year 3	C.3.2.2. Appreciate how search results are selected and ranked. • Can understand that search engines select pages according to keywords found in the content. • When using search engines, can demonstrate their understanding that the pages shown include the keywords they have specified. • Can use this knowledge by thinking of good keywords appropriate for what they are searching.
	Year 4	C.4.2.2. Appreciate how search results are selected and ranked. • Can understand that search engines rank pages according to relevance. • Can demonstrate their understanding that search engine results are ranked according to relevance, and that normally the top results on the first page are likely to be those most relevant to their query. • If unable to find good results on the first page, can reconsider their keywords rather than looking at further pages of results.
	Year 5	C.5.2.2. Appreciate how search results are selected and ranked. • Can understand that search engines use a cached copy of the crawled web to select and rank results. • Can explain how a search engine creates an index from a cached copy of the web and uses this to select and rank results. • Shows an awareness of the Page Rank algorithm in which results are ranked according to the number and quality of in-bound links.
	Year 6	C.6.2.2. Appreciate how search results are selected and ranked. • Can appreciate that search engines rank pages based on the number and quality of in-bound links. • Can demonstrate some awareness of the Page Rank algorithm, explaining that the quality of a page is determined

		largely on the basis of the number and quality of links pointing to that page in the engine's cached copy of the web, and that quality is itself determined recursively through Page Rank.
--	--	--

Domain: Digital Literacy		
Sub strand: E safety		
Use technology safely, respectfully and responsibly.	EYFS	Personal, Social, Emotional Development: • See themselves as a valuable individual • Express their feelings • Identify and moderate their own feelings socially and emotionally
	Year 1	C.1.1.1. Use technology safely and respectfully. • Can keep themselves safe while using digital technology. • Can understand that they need to keep safe when using digital technology. For example, they should know to use filtered Safe Search when looking for images on the web and that they should close the lid of a laptop (or turn over a tablet) and alert an adult if they come across unsuitable content.
	Year 2	C.2.1.1. Use technology safely and respectfully • Can keep safe and show respect to others while using digital technology. • Know that they need to keep themselves safe when using digital technology: - ○ know to use filtered SafeSearch when looking for images on the web and that they should close the lid of a laptop (or similar action) if they find inappropriate images ○ know to respect others' rights, including privacy and intellectual property when using computers, so should not look at someone else's work or copy it without permission and acknowledgement. ○ Know to observe age restrictions on computer games.
	Year 3	C.3.1.1. Use technology safely, respectfully and responsibly. • Can use digital technology safely and show respect for others when working online. • Know that they need to keep themselves safe when using digital technology: - ○ show respect for others when filming and should not normally post videos online ○ if responding to online surveys, know to do so anonymously, thinking carefully about information they give out.
	Year 4	C.4.1.1. Use technology safely, respectfully and responsibly. • Can demonstrate that they can act responsibly when using computers. • Can act responsibly when using computers: ○ know to act responsibly when developing computer games or prototype products ○ behave responsibly when using sampled music or creating a composition

		○ show responsibility when creating or remixing online content, including observing copyright and any terms and conditions ○ contributes positively to a shared wiki.
	Year 5	C.5.1.1. Use technology safely, respectfully and responsibly. • Can demonstrate that they can act responsibly when using the Internet. • Can act responsibly when using the Internet. For example, they should act responsibly when participating in an online community, such as the Scratch community, if permitted to do so. They should demonstrate that they understand the importance of encrypted (HTTPS) connections when browsing the web and of using strong passwords to protect their identity online. They should act responsibly when creating, editing or commenting on web pages or blog posts.
	Year 6	C.6.1.1. Use technology safely, respectfully and responsibly. • Can show that they can think through the consequences of their actions when using digital technology. • Can discuss likely and potential consequences of their actions when using digital technology in a range of contexts. Contexts might include developing smartphone apps; using online project management tools; collecting information for market research; posting original content online.
Keeping personal information private.	Year 1	C.1.1.2. Keeping personal information private. • Can understand that information on the Internet can be seen by others. • Knows that information stored on the web or transmitted via the Internet is available to other people: ○ know that the images they find online can be found by others too, ○ know that the queries they type in can be seen by those who run the search engine they use and the school's network.
	Year 2	C.2.1.2. Keeping personal information private. • Can understand that they should not share personal information online. • Understand that personal information should be kept private: it should not be posted online to a public audience and should only be shared privately with those who they (or their parents) would trust: ○ know that photos they take in school should not normally be posted to the open web. ○ know that photos taken with smartphones often contain hidden information about where the photo was taken.
	Year 3	C.3.1.2. Recognise acceptable/unacceptable behaviour. • Can recognise unacceptable behaviour when using digital technology. • Can identify what would be unacceptable or inappropriate behaviour when using digital technology in a range of contexts: ○ know what would be unacceptable when using online communities, such as the Scratch website, or when shooting or publishing video ○ know what would be unacceptable use of the Command prompt, email or online survey tools.

	Year 4	C.4.1.2. Recognise acceptable/unacceptable behaviour • Understand the difference between acceptable and unacceptable behaviours when using digital technology • Can discuss the difference between acceptable and unacceptable behaviours when using digital technology in a range of contexts. Contexts could include the Scratch website, or other online communities; the use of others' original content, such as music samples or web pages; wikis, including Wikipedia.
	Year 5	C.5.1.2. Recognise acceptable/unacceptable behaviour. • Can discuss the consequences of particular behaviours when using digital technology. • Can discuss the likely or possible consequences of particular behaviours when using digital technology in a range of contexts. Contexts could include the Scratch website, or other online communities; using cryptography and passwords; creating websites or writing blog posts.
	Year 6	C.6.1.2. Recognise acceptable/unacceptable behaviour. • Can identify principles underpinning acceptable use of digital technologies. • Can identify some principles underpinning acceptable behaviour when using technologies in a range of contexts. Contexts could include smartphone or tablet use; the use of online project management tools; online surveys and recording of interviews; creating and sharing digital content.
Identify where to go for help and support when they have concerns about content or contact on the Internet or other online technologies.	Year 1	C.1.1.3. Identify where to go for help and support when they have concerns about content or contact on the Internet or other online technologies. • Can understand what to do if they see disturbing content online at home or at school. • Know to close their laptop lid or turn their tablet over if they find content, such as inappropriate images, which might disturb them or other pupils. • Know to tell their teacher or their parents/carers if this happens.
	Year 2	C.2.1.3. Identify where to go for help and support when they have concerns about content or contact on the Internet or other online technologies. • Can understand what to do if they have concerns about content or contact online. • Know to close their laptop lid or turn their tablet over if they find content, such as inappropriate images, which might disturb them or other pupils; if someone they don't trust contacts them online; if someone makes inappropriate contact online. • Know to tell their teacher or their parents/carers if this happens, and be aware that they could talk to another trusted adult or to Childline about this.
	Year 3	C.3.1.3. Know a range of ways to report concerns and inappropriate behaviour. • Know who to talk to about concerns and inappropriate behaviour in school. • Know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult, and that they can discuss any concerns they have with their teacher or other trusted adults in

		school.
	Year 4	C.4.1.3. Know a range of ways to report concerns and inappropriate behaviour. • Know who to talk to about concerns and inappropriate behaviour at home or in school. • Know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult, and that they can discuss any concerns they have with their teacher or other trusted adults in school. • Know that any concerns over, or inappropriate behaviour with, digital technology at home can be discussed with their parents, with you or with another trusted adult.
	Year 5	C.5.1.3. Know a range of ways to report concerns and inappropriate behaviour. • Know how to report concerns and inappropriate behaviour in a range of contexts. • Know how to report inappropriate behaviour when using technology in school: preferably this will be to their teacher, the network manager or another trusted adult. • Know how to report any concerns over inappropriate behaviour with digital technology at home. Preferably this would be through discussion with their parents, with you or with another trusted adult. • Know how to report inappropriate behaviour to those running websites which they regularly use, and to Childline, CEOP or to the police.
Be discerning in evaluating digital content.	Year 6	C.6.1.3. Know a range of ways to report concerns and inappropriate behaviour. • Know a range of ways to report concerns and inappropriate behaviour in a variety of contexts. • Know how to report inappropriate behaviour when using technology in school: preferably this will be to their teacher, the network manager or another trusted adult. • Know how to report any concerns over, or inappropriate behaviour with, digital technology at home. Preferably this would be through discussion with their parents, with you or with another trusted adult. • Know how to report inappropriate behaviour to those running websites which they regularly use, and to Childline, CEOP or the police. • Know that illegal content or activities can be reported to CEOP or the police.
	Year 3	C.3.1.X. Be discerning in evaluating digital content. • Can decide whether a web page is relevant for a given purpose or question. • Can form a judgement about whether a web page is appropriate for finding out the answer to a question they have or for a given purpose.
	Year 4	C.4.1.X. Be discerning in evaluating digital content. • Can decide whether digital content is relevant for a given purpose or question. • Can form a judgement about whether a web page, such as a Wikipedia article, or other digital content is appropriate

		for finding out the answer to a question they have or for a given purpose.
	Year 5	C.5.1.X. Be discerning in evaluating digital content. • Can decide whether digital content is reliable and unbiased. • Can discuss whether particular content (such as a web page, other pupils' pages or blog posts) is reliable and whether it has been written from a neutral point of view. • Can spot some examples of bias in digital content.
	Year 6	C.6.1.X. Be discerning in evaluating digital content. • Can form an opinion about the effectiveness of digital content. • Taking into account the intended audience and purpose of the content, can form a judgement as to, and provide reasons for, the extent to which they consider digital content to be effective. The content might be media resources or marketing materials.
Understand the opportunities networks offer for communication and collaboration.	Year 3	C.3.1.4. Understand the opportunities networks offer for communication and collaboration. • Can use email and videoconferencing in class.
	Year 4	C.4.1.4. Understand the opportunities networks offer for communication and collaboration. • Can work collaboratively with classmates on a shared wiki. • Can work collaboratively with their peers on a shared project, such as a class wiki, making useful contributions and providing feedback to others.
	Year 5	C.5.1.4. Understand the opportunities networks offer for communication and collaboration. • Can work collaboratively with classmates on a class website or blog. • Can work productively and positively with others when developing a shared website or contributing to a class blog.
	Year 6	C.6.1.4. Understand the opportunities networks offer for communication and collaboration • Can use online tools to plan and carry out a collaborative project. • Can make use of an online tool to plan and carry out a collaborative project.
Sub strand: Using IT beyond school		
Recognise common uses of information technology beyond school.	EYFS	Communication Language and Literacy: • Develop social phrases • Use new vocabulary
	Year 1	C.1.2.1. Recognise common uses of information technology beyond school. • Can show an awareness of how IT is used for communication beyond school. • Can mention some of the ways in which IT is used to communicate beyond school: ○ know that some people use social media such as Facebook, email, video calls or online greetings to say happy birthday to their friends.

	Year 2	C.2.2.1. Recognise common uses of information technology beyond school. • Can show an awareness of how IT is used for a range of purposes beyond school. • Can name a number of purposes for which IT is used beyond school. • Know that adults can share work and discuss ideas in online communities; that photos can be taken, edited and shared easily using digital technology; that the web is made up of information shared by people and organisations; that people use email for a range of purposes and in a variety of contexts; that scientists use computers when collecting and analysing data.
--	--------	--

Appendix 1 – Criteria for evaluation

- Apps/software are introduced through our adopted scheme - SwitchedOn Computing.
- Children are taught how to find other programs/websites/apps that may do the same job e.g. using Google searches.
- Children are taught the following criteria for evaluation.
 - Accessibility - How easy is it to find/access?
 - Intuitiveness - How easy is it to use?
 - Functionality - What can/can't you do with it?
 - Success - Does it enable you to complete the task?
 - Output - Can you publish your work in a format that is useful?
- Children are introduced to the following questions:
 - *"Here are 2 (or more) apps/packages to solve this problem/achieve this outcome. Which is the better/best and why?"*
 - *"Here's a problem to solve/task to complete - you decide the software/technologies to use. Evaluate how effective your choices were in helping you to solve the problem/complete the task."*

Appendix 2 – Links with other subjects

Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems: -

- natural systems: e.g. DNA, ecosystems, water cycle, lifecycles
- artificial systems: e.g. micro technology, GM crops, Borlaug wheat

Key Stage	Examples
Key Stage 1	Natural – life cycles Artificial – shapes, patterns with numbers in nature
Lower Key Stage 2	Natural - water cycle, ecosystems, shape drawing using a Turtle (link to maths) Artificial - Borlaug wheat
Upper Key Stage 2	Natural - DNA (Y6 science) - adaptation and evolution and sex education; Fibonacci- the Golden Mean and natural world ratios and geometry Artificial - gene selection (PSHE) and manipulating gene structures

Appendix 3 – Glossary

Vocabulary	Meaning
Algorithm	An unambiguous procedure or precise step-by-step guide to solve a problem or achieve a particular objective
Computer networks	The computers and the connecting hardware (wifi access points, cables, fibres, switches and routers) that make it possible to transfer data using an agreed method ('protocol')
Control	Using computers to move or otherwise change 'physical' systems. The computer can be hidden inside the system or connected to it
Data	A structured set of numbers, representing digitised text, images, sound or video, which can be processed or transmitted by a computer
Debug	To detect and correct the errors in a computer program
Digital content	Any media created, edited or viewed on a computer, such as text (including the hypertext of a web page), images, sound, video (including animation), or virtual environments, and combinations of these (i.e. multimedia)
Information	The meaning or interpretation given to a set of data by its users, or which results from data being processed
Input	Data provided to a computer system, such as via a keyboard, mouse, microphone, camera or physical sensors
Internet	The global collection of computer networks and their connections, all using shared protocols (TCP/IP) to communicate
Logical reasoning	A systematic approach to solving problems or deducing information using a set of universally applicable and totally reliable rules
Output	The information produced by a computer system for its user, typically on a screen, through speakers or on a printer, but possibly through the control of motors in physical systems
Program	A stored set of instructions encoded in a language understood by the computer that does some form of computation, processing input and/or stored data to generate output
Repetition	A programming construct in which one or more instructions are repeated, perhaps a certain number of times, until a condition is satisfied or until the program is stopped

Search	To identify data that satisfies one or more conditions, such as web pages containing supplied keywords, or files on a computer with certain properties
Selection	A programming construct in which the instructions that are executed are determined by whether a particular condition is met
Sequence	To place programming instructions in order, with each executed one after the other
Services	Programs running on computers, typically those connected to the internet, which provide functionality in response to requests; for example, to transmit a web page, deliver an email or allow a text, voice or video conversation
Simulation	Using a computer to model the state and behaviour of real-world (or imaginary) systems, including physical and social systems; an integral part of most computer games
Software	Computer programs, including both application software (such as office programs, web browsers, media editors and games) and the computer operating system. The term also applies to 'apps' running on mobile devices and to web-based services
Variables	A way in which computer programs can store, retrieve or change simple data, such as a score, the time left, or the user's name
World Wide Web	An information system on the internet which allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.