



Computing: Progression of knowledge and skills

Computing: Key Stage 1						
Computer Science			Information Technology	Digital Literacy		
Problem Solving	Programming	Logical Thinking	Creating Content	E-Safety	Using ICT Beyond School	
<p><i>Understand what algorithms are.</i></p> <p><i>Understand that algorithms are implemented as programs on digital devices.</i></p> <p><i>Understand that programs execute by following precise and unambiguous instructions.</i></p>	<p><i>Create simple programs,</i></p> <p><i>Debug simple programs.</i></p>	<p><i>Use logical reasoning to predict the behaviour of own programs.</i></p> <p><i>Use logical reasoning to predict the behaviour of others' programs.</i></p>	<p><i>Use technology purposefully to organise, store and retrieve digital content.</i></p> <p><i>Use technology to purposefully create and manipulate digital content.</i></p>	<p><i>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</i></p>	<p><i>Recognise common uses of technology at home and beyond school</i></p>	
Year 1	<ul style="list-style-type: none"> • Recognise a set of directions as an algorithm (1.1). • Recognise the steps of a recipe as an algorithm (1.2). • Understand that there are algorithms for grouping or sorting things (1.4). • Create a Bee Bot program, implementing the 	<ul style="list-style-type: none"> • Give the Bee Bot a complete program (1.1). 	<ul style="list-style-type: none"> • Explain what their own or another child's program will do before it is run (1.1). 	<ul style="list-style-type: none"> • Film and upload a child cooking (1.2). • Open the e-book, import illustrations, add them to the e-book and save their work (1.3). • Retrieve previous work, import further illustrations and save their work (1.4). • Open the template, record audio, import it to the computer and save their work (1.5). • Open the card template, find images online and save their work 	<ul style="list-style-type: none"> • Understand that the images they search for can be seen by others (1.3, 1.4, 1.6). • Know to close the laptop lid or turn the tablet over and tell a teacher or their parents if they find inappropriate images (1.3, 1.4, 1.6). 	<ul style="list-style-type: none"> • Be aware that many people send greetings online rather than using cards now (1.6).

	<p>complete algorithm for their solution (1.1).</p> <ul style="list-style-type: none"> • Create a Bee Bot program, implementing the complete algorithm for their solution (1.1). 			<p>(1.6).</p> <ul style="list-style-type: none"> • Film digital video (1.2). • Create an original painting (1.3). • Create original digital audio (1.5). • Type their own text (1.6). 		
<p>Year 2</p>	<ul style="list-style-type: none"> • Recognise sets of directions as algorithms (2.1). • Recognise that the rules of a game are an algorithm (2.2). • Think of the steps to taking and editing photographs as an algorithm (2.3). • Program the Bee Bot and the Space Simulator to solve the problems set (2.1). • Recognise how the Scratch games implement sets of rules (2.2). 	<ul style="list-style-type: none"> • Create their own program for the space simulator, correcting any errors (2.1). 	<ul style="list-style-type: none"> • Give logical explanations for what their own or their peers' programs will do (2.1). • Give logical explanations for what happens in the games (2.2). 	<ul style="list-style-type: none"> • Review, reject and rate the photographs they have taken (2.3). • Find useful information on websites (2.4). • Save and retrieve their presentations; add images or other media as appropriate (2.5). • Use questions to sort and classify objects; take, upload and organise photographs; add information to a map (2.6). • Take and edit original digital photographs (2.3). • Create and edit their own presentation (2.4). • Write and edit an email (2.5). • Take and edit photographs and create and edit charts (2.6). 	<ul style="list-style-type: none"> • Know that photos of themselves or other people should not normally be uploaded to the open web (2.2, 2.6). • Know that photos can contain metadata revealing where they were taken (2.6). • Know to close the laptop lid or turn the tablet over and tell a teacher, their parents, another trusted adult or ChildLine if they find inappropriate content (2.4, 2.5). 	<ul style="list-style-type: none"> • Recognise that people can share work and discuss ideas using online communities (2.1, 2.2). • Recognise that people take, edit and share photographs using digital technology (2.3). • Recognise that people publish useful information on the web (2.4). • Recognise that email is used in many contexts (2.5). • Recognise that scientists use a range of digital technologies when collecting and analysing data (2.6).

Computing: Key Stage 2

Computer Science		Information Technology		Digital Literacy		
Problem Solving	Programming	Logical Thinking	Creating Content	Searching	E-Safety	
<i>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</i>	<i>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</i>	<i>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</i>	<i>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</i>	<i>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</i>	<i>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</i> <i>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</i>	
Year 3	<ul style="list-style-type: none"> • Create an animation in Scratch (3.1) • Explore the tennis and racing car simulator programs (3.2) • Plan an animation project (3.1). • Plan their video 	<ul style="list-style-type: none"> • Use sequences of instructions in their Scratch animation program (3.1). • Create a simple animation program in Scratch (3.1) 	<ul style="list-style-type: none"> • Explain the idea for their animation in their own words (3.1). • Explain the idea for their video in their own words (3.3) • Use logical reasoning to spot bugs in their animation (3.1). • Use logical reasoning to spot the bugs in the 	<ul style="list-style-type: none"> • Use Movie Maker (3.3) • Use the Command prompt and network program (3.4) • Use Outlook or webmail and Skype (3.5) • Use Google Forms, Google Sheets and Google Slides (3.6). • Plan and shoot video (3.3). • Plan and create a 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Take care to film appropriately and not publish video of other children (3.3). • Use the Command prompt with care (3.4). • Take care with links and attachments in email (3.5). • Ensure questions are answered anonymously (3.6). • Recognise unacceptable behaviour when using the

	<p>project (3.3).</p> <ul style="list-style-type: none"> Plan their online survey-based project (3.6) 		<p>programs provided (3.2)</p> <ul style="list-style-type: none"> Recognise that information is communicated through the internet in a binary code (3.4). Understand that email and videoconferencing also take place through transmitting binary information (3.5). Understand that emails and video-conferencing are routed via the internet (3.5) 	<p>presentation (3.5).</p> <ul style="list-style-type: none"> Plan and then write survey questions, and plan and create a presentation (3.6). Shoot and then show video (3.3). Read and respond to email (3.5). Collect and present survey results (3.6) 	<ul style="list-style-type: none"> Use keywords when searching. 	<p>Scratch community (3.1 and 3.2).</p> <ul style="list-style-type: none"> Recognise unacceptable behaviour when shooting or publishing video (3.3). Recognise unacceptable behaviour when using the Command prompt (3.4). Recognise unacceptable behaviour when using email (3.5). Recognise unacceptable behaviour when creating or completing online surveys (3.6). Know to tell a teacher about any concerns or inappropriate behaviour in any units.
Year 4	<ul style="list-style-type: none"> Plan and develop a simple educational game, e.g. a maths quiz, in Scratch (4.1). Plan and develop a prototype for an interactive 	<ul style="list-style-type: none"> Write a maths test program using sequences of instructions and repetition(4.1) Create a prototype for an interactive toy using 	<ul style="list-style-type: none"> Explain the algorithm for their question and answer game, including repeating elements (4.1) Explain the algorithms used in their toy, including repeating elements (4.2) Discuss their compositions, including 	<ul style="list-style-type: none"> Combine composition and audio editing software (4.3) Combine a text editor and web browser in (4.4) Combine spreadsheet and presentation software in (4.6.) Compose original music for a particular purpose (4.3) 	<ul style="list-style-type: none"> Use Google to support their wiki research project(4.5) Appreciate how Wikipedia's search engine ranks results(4.6) 	<ul style="list-style-type: none"> act responsibly in developing their game and toy prototype(4.1 and 4.2) act responsibly when creating their composition (4.3) take care to act responsibly when creating or remixing web pages, including observing copyright(4.4) contribute positively to the class

	<p>toy in Scratch (4.2).</p> <ul style="list-style-type: none"> • Develop a prototype for an interactive toy (4.2) • Work with a partner to plan how to tackle these programming projects (4.1 and 4.2) • Contribute to a discussion about how the class could create a wiki or monitor and forecast the weather (4.1). 	<p>sequences of instructions and repetition (4.2)</p> <ul style="list-style-type: none"> • Create compositions as sequences of notes with some repeating elements, e.g. a bass line(4.3) • Display questions on screen and accept typed input(4.1) • Show toy on screen and have it respond to key presses (4.2) 	<p>repeating patterns of notes (4.3)</p> <ul style="list-style-type: none"> • Understand that music is broken down into packets for transmission over the internet (4.3) • Understand that the HTML for a web page is broken into packets for transmission over the internet (4.4) • Recognise how the internet makes it possible to request and receive web pages (4.4 and 4.5) 	<ul style="list-style-type: none"> • Create web content through writing HTML code for a particular purpose (4.4) • Contribute content to a wiki for a particular purpose(4.5) • Create a presentation on the weather (4.6) • Record and use audio samples(4.3) • Collect weather data and make a presentation about the weather(4.6) 		<p>wiki (4.5)</p> <ul style="list-style-type: none"> • know the difference between acceptable and unacceptable behaviour in the Scratch community (4.1 and 4.2) • know the difference between acceptable and unacceptable web pages and remixes, recognising what constitutes parody or fair use (4.4) • recognise the difference between acceptable and unacceptable behaviour in a class wiki or on Wikipedia (4.5) • Know to tell a teacher about any concerns or inappropriate behaviour in any units. Know that concerns in relation to the Scratch community can be reported to the community moderators (units 4.1 and 4.2). • Know that they should talk to their parents about concerns and inappropriate behaviour outside school. • decide if a given Wikipedia page or other content is helpful for the topic they are researching(4.5)
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						<ul style="list-style-type: none"> • make useful contributions to the class wiki and provide feedback to others on their pages (4.5)
Year 5	<ul style="list-style-type: none"> • Design, write and debug their own game in Scratch (5.1) • Design, program and debug their own geometric pattern in Scratch (5.1). • Use decomposition to plan how they will create a game, a website and a virtual art gallery. (5.1 and 5.6) 	<ul style="list-style-type: none"> • Program a game which includes sequence, selection and repetition. (5.1) • Use the keyboard and/or mouse for input for their game, produce output on screen and use sound effects, music or narration. (5.1) 	<ul style="list-style-type: none"> • Explain the rules of their game in their own words. (5.1) • Spot and correct errors in the rules of their game. (5.1) • Spot and correct errors in the algorithm for their geometric pattern (5.3) • Understand how encrypted messages are routed on the internet. (5.2) • Understand how web pages are routed on the internet (5.4 and 5.5) • Gain experience of creating web pages using content management systems and understand how these pages are transmitted via the internet.) (5.4 and 5.5) 	<ul style="list-style-type: none"> • Combine local media with web-based Scratch programs. (5,1) • Combine local media, including that captured using portable technology, with a web-based content management system. (5.4 and 5.5) • Use digital photographs and other media in a virtual art gallery. (5.6) • Design and create a computer game in response to a given brief. (5.1) • Design and create a geometric pattern using turtle graphics in response to a given brief. (5.3) • Evaluate the quality of the information on which they are drawing. Analyse this to provide a clear and coherent summary on their own page. (5.4) 	<ul style="list-style-type: none"> • Use the filters in Google to search for information relevant to the topic of their web page and appropriate for its intended audience. (5.4) • Understand that Google uses a cached copy of the crawlable web to generate search results, using the links between the pages in the cache to determine the rank order in which results are displayed. (5.4) 	<ul style="list-style-type: none"> • Contribute positively to the Scratch community, if permitted to do so. (5.1) • Recognise the importance of encrypting private information when communicating online and of using strong passwords. (5.2) • Act responsibly when creating, editing or commenting on pages or blog posts. (5.4 and 5.5) • Discuss the consequences of particular behaviours in the Scratch community. (5.1) • Discuss the consequences of particular behaviours when using cryptography and when using passwords. (5.2) • Discuss the consequences of particular behaviours when developing online content for a website or blog.) (5.4 and 5.5) • Know to tell a teacher about any concerns or inappropriate behaviour in any units. Know that concerns in relation to the Scratch

						<p>community can be reported to the community moderators (units 5.1 and 5.3).</p> <ul style="list-style-type: none"> • Know that concerns over illegal web content can be reported to the police. Know that they should talk to their parents about concerns and inappropriate behaviour outside school. (5.4 and 5.5) • Decide whether external content is reliable and unbiased before using it in their own web page. (5.4) • Comment on the reliability and bias of others' pages or posts. (5.4 and 5.5) • Work collaboratively with classmates on the class website and the class blog in 5.5. (5.4 and 5.5)
Year 6	<ul style="list-style-type: none"> • Plan, implement and debug their own app for a smartphone or tablet. (6.1, 6.4 and 6.5) 	<ul style="list-style-type: none"> • Make use of sequence, selection, repetition and variables in their app. (6.5) • Use touch 	<ul style="list-style-type: none"> • Give clear and precise explanations of the event-driven algorithms they've used in the app. (6.4 and 6.5) • Use logical reasoning to detect and correct errors 	<ul style="list-style-type: none"> • Use a range of media to create an effective pitch presentation in software of their own choice. (6.1) • Use a range of media packages of their own choice to market their app. 	<ul style="list-style-type: none"> • Use a number of search engines to find out about smartphone or tablet apps. (6.1) • In developing their website in 	<ul style="list-style-type: none"> • Consider the potential consequences of any apps they develop for themselves and their users. (6.1, 6.4 and 6.5) • Think through the consequences of how they use online project management tools. (6.2)

	<ul style="list-style-type: none"> • Incorporate additional input and output available in the smartphone or tablet for which they are developing their app, if appropriate. (6.1, 6.4 and 6.5) • Use decomposition to plan how they will tackle the app development project; follow their plan in subsequent units. (6.2) 	<p>screen and other input (e.g. GPS or accelerometer) and screen, speaker and other output (e.g. vibration motor, network connectivity) in their app. (6.4 and 6.5)</p>	<p>in the event-based algorithms they use in their app and in their code. (6.4 and 6.5)</p> <ul style="list-style-type: none"> • Demonstrate an understanding of how networks such as the cellular telephone system, Bluetooth and NFC operate. (6.1) • Know how a domain name is converted into an IP address. (6.6) 	<p>(6.6)</p> <ul style="list-style-type: none"> • Design and build a smartphone or tablet app for an agreed purpose. (6.1, 6.4 and 6.5) • Conduct market research into their planned app, evaluating and analysing the data obtained. (6.3) 	<p>6.6, recognise how its search rank can be improved by having links to it from other high-ranking websites. (6.6)</p>	<ul style="list-style-type: none"> • Consider the consequences of collecting information in market research. (6.3) • Consider the consequences of posting original content online. (6.6) • Identify principles underpinning acceptable smartphone and tablet use. (6.1, 6.4 and 6.5) • Identify principles underpinning acceptable use of online project management tools. (6.2) • Identify principles underpinning acceptable use of surveys and recorded interviews. (6.3) • Identify principles underpinning acceptable creation and sharing of digital content. (6.6) • Form an opinion about the effectiveness of the apps they explore. (6.1) • Form an opinion about how effective their own media resources and interface designs are. (6.4) • Form an opinion about how effective their own marketing
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						<p>materials are. (6.6)</p> <ul style="list-style-type: none">• Plan the app development project using online tools. (6.2)• Use these tools to keep track of progress and share ideas. (6.3-6.6)
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Numbers in brackets represent Switched on Computing unit