

## Computing National Curriculum Key Stage 1

### 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
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- 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

Key Stage 1 Cycle A		Key Stage 1 Cycle B	
Logging on and Paint	Navigating Websites	Logging on and Paint 2	Technology all around us
Beebot and Beebot Apps	Computers and the World Around us	Beebot and Beebot Apps 2	Coding Apps
Scratch Junior	E-book Creation	Introduction to animation	Scratch Junior 2

## Computing National Curriculum Key Stage 2

### 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
- 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
- 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

*Italics – Target Tracker Statements*

Year 3 & 4 Cycle A	Year 3 & 4 Cycle B	Year 5 & 6 Cycle A	Year 5 & 6 Cycle B
Introduction to Scratch – Animation Lightbot & Coding Apps	Introduction to Scratch – drawing project Using word to create Art	Scratch Paddle Board Game Sketch Up 3d drawing	Scratch Time Lapse Animation Social Media & E-safety
Isle of tune Databases	Network explorers One off – Fake websites/trusting the internet Code.org	Cloud Computing Stop Motion with lego/clay	Dragons Den
Code breaking Music Repeat Loops with Scratch	Scratch Chat bots & AI Childnet Esafety video competition	Scratch Pacman Game 3d printing unit	Data logging 3d printing unit

### Computer Science – algorithms and programming

#### Pupils will be taught to:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• create a series of instructions.</li> <li>• plan a journey for a programmable toy</li> <li>• create a simple series of instructions - left and right</li> <li>• record their routes</li> <li>• understand forwards, backwards, up and down</li> <li>• put two instructions together to control a programmable toy</li> <li>• to plan and test a Bee-bot journey</li> <li>• <i>predict the behaviour of a programmed toy</i></li> <li>• <i>explain that an algorithm is a step by step set of</i></li> </ul>	<ul style="list-style-type: none"> <li>• use a range of instructions (e.g. direction, angles, turns)</li> <li>• test and amend a set of instructions</li> <li>• <i>find errors and amend (debug)</i></li> <li>• <i>write a simple program and test it</i></li> <li>• predict what the outcome of a simple program will be (logical reasoning)</li> <li>• understand that algorithms are used on digital device</li> <li>• understand that programs require precise instructions</li> <li>• <i>predict the outcomes of a set of instructions</i></li> <li>• use right angle turns</li> </ul>	<ul style="list-style-type: none"> <li>• design a sequence of instructions, including directional instructions</li> <li>• write programs that accomplish specific goals</li> <li>• <i>work with various forms of input</i></li> <li>• <i>work with various forms of output</i></li> <li>• experiment with variables to control models</li> <li>• use 90 degree and 45 degree turns</li> <li>• give an on-screen robot directional instructions</li> <li>• draw a square, rectangle and other regular shapes on screen, using commands</li> </ul>	<ul style="list-style-type: none"> <li>• experiment with variables to control models</li> <li>• give an on-screen robot specific instructions that takes them from A to B</li> <li>• make an accurate prediction and explain why I believe something will happen (linked to programming)</li> <li>• <i>de-bug a program</i></li> <li>• use repeat instructions to draw regular shapes on screen, using commands</li> <li>• experiment with variables to control models</li> <li>• make turns specifying the degrees</li> <li>• give an on-screen robot</li> </ul>	<ul style="list-style-type: none"> <li>• combine sequences of instructions and procedures to turn devices on and off</li> <li>• <i>use technology to control an external device</i></li> <li>• design algorithms that use repetition &amp; 2-way selection</li> <li>• combine sequences of instructions and procedures to turn devices on or off</li> <li>• understand input and output</li> <li>• use an ICT program to control an external device that is electrical and/or mechanical</li> <li>• use ICT to measure sound or light or temperature using sensors</li> </ul>	<ul style="list-style-type: none"> <li>• <i>design a solution by breaking a problem up</i></li> <li>• recognise that different solutions can exist for the same problem</li> <li>• use logical reasoning to detect errors in algorithms</li> <li>• use selection in programs</li> <li>• <i>work with variables</i></li> <li>• explain how an algorithm works</li> <li>• explore 'what if' questions by planning different scenarios for controlled devices</li> <li>• explain how an algorithm works</li> <li>• <i>detect errors in a program and correct them</i></li> </ul>

<i>instructions</i>	<ul style="list-style-type: none"> <li>• use the repeat commands</li> <li>• test and amend a set of instructions</li> <li>• write a simple program and test it</li> <li>• predict what the outcome of a simple program will be</li> </ul>	<ul style="list-style-type: none"> <li>• write more complex programs</li> </ul>	<p>specific directional instructions that takes them from x to y</p> <ul style="list-style-type: none"> <li>• make accurate predictions about the outcome of a program they have written</li> </ul>	<ul style="list-style-type: none"> <li>• <i>explore 'What if' questions by playing adventure or quest games</i></li> <li>• write programs that have sequences and repetitions</li> </ul>	<ul style="list-style-type: none"> <li>• use an ICT program to control a number of events for an external device</li> <li>• use ICT to measure sound, light or temperature using sensors and interpret the data</li> <li>• <i>explore 'what if' questions by planning different scenarios for controlled devices</i></li> <li>• use input from sensors to trigger events</li> <li>• check and refine a series of instructions</li> </ul>
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### Information Technology: Data Retrieving and Organising

#### Pupils will be taught to:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• create digital content</li> <li>• store digital content</li> <li>• retrieve digital content</li> <li>• use a website</li> <li>• use a camera</li> <li>• record sound and play back</li> <li>• capture images with a camera</li> <li>• print out a photograph from a camera with help</li> <li>• record a sound and play it back</li> <li>• enter information into a template to make a graph</li> <li>• talk about the results shown on a graph</li> </ul>	<ul style="list-style-type: none"> <li>• organise digital content</li> <li>• retrieve and manipulate digital content</li> <li>• navigate the web to complete simple searches</li> <li>• find information on a website</li> <li>• click links in a website</li> <li>• print a web page to use as a resource</li> <li>• experiment with text, pictures and animation to make a simple slide show</li> <li>• use the shape tools to draw</li> <li>• <i>find, open, edit and save files they are working on</i></li> <li>• <i>use different software</i></li> </ul>	<ul style="list-style-type: none"> <li>• use a range of software for similar purposes</li> <li>• collect information</li> <li>• design and create content</li> <li>• present information</li> <li>• <i>search for information on the web in different ways</i></li> <li>• manipulate and improve digital images</li> <li>• review images on a camera and delete unwanted images</li> <li>• experience downloading images from a camera into files on the computer</li> <li>• use photo editing software to crop photos and add</li> </ul>	<ul style="list-style-type: none"> <li>• select and use software to accomplish given goals</li> <li>• collect and present data</li> <li>• produce and upload a podcast</li> <li>• capture images using webcams, screen capture, scanning, visualizer and internet</li> <li>• choose images and download into a file</li> <li>• download images from the camera into files on the computer</li> <li>• copy graphics from a range of sources and paste into a desktop publishing</li> </ul>	<ul style="list-style-type: none"> <li>• analyse information</li> <li>• evaluate information</li> <li>• understand how search results are selected and ranked</li> <li>• edit a film</li> <li>• listen to streaming audio such as online radio</li> <li>• download and listen to podcasts</li> <li>• produce and upload a podcast</li> <li>• manipulate sounds</li> <li>• select music from open sources and incorporate it into multimedia presentations</li> </ul>	<ul style="list-style-type: none"> <li>• <i>select, use and combine software on a range of digital devices</i></li> <li>• use a range of technology for a specific project</li> <li>• explore the menu options and experiment with images (colour effects, options, snap to grid, grid settings etc.)</li> <li>• add special effects to alter the appearance of a graphic</li> <li>• 'save as' gif or i peg. wherever possible to make the file size smaller (for emailing or downloading)</li> </ul>

	<i>programs and discuss the benefits of their usage</i>	effects <ul style="list-style-type: none"> <li>• manipulate sound when using simple recording story boarding</li> <li>• input data into a prepared database</li> <li>• sort and search a database to answer simple questions</li> <li>• use a branching database</li> </ul>	program <ul style="list-style-type: none"> <li>• input data into a prepared database</li> <li>• sort and search a database to answer simple questions</li> <li>• recognise what a spread sheet is</li> <li>• use the terms 'cells', 'rows' and 'columns'</li> <li>• enter data, highlight it and make bar charts</li> </ul>	<ul style="list-style-type: none"> <li>• work on simple film editing</li> <li>• create a formula in a spreadsheet and then check for accuracy and plausibility</li> <li>• search databases for information using symbols such as = &gt; or &lt;</li> <li>• create databases planning the fields, rows and columns</li> <li>• create graphs and tables to be copied and pasted into other documents</li> </ul>	<ul style="list-style-type: none"> <li>• make an information poster using their graphics skills to good effect</li> <li>• explore the menu options and experiment with images (colour effects, options, snap to grid, grid settings etc.)</li> <li>• add special effects to alter the appearance of a graphic</li> <li>• collect live data using data logging equipment</li> <li>• identify data error, patterns and sequences</li> <li>• use the formulae bar to explore mathematical scenarios</li> <li>• create their own database and present information from it</li> </ul>
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**Digital Literacy: Communicating, Using the Internet and Presentation**

**Pupils will be taught to:**

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>• use technology safely</li> <li>• keep personal information private</li> <li>• recognise what an email address looks like</li> <li>• join in sending a class email</li> <li>• use the @ key and type an email address</li> <li>• word process ideas using a keyboard</li> </ul>	<ul style="list-style-type: none"> <li>• use technology respectfully</li> <li>• know where to go for help if concerned</li> <li>• send and reply to messages sent by a safe email partner (within school)</li> <li>• word process a piece of text</li> <li>• insert/delete a word using the mouse and arrow key</li> </ul>	<ul style="list-style-type: none"> <li>• use technology respectfully and responsibly</li> <li>• know different ways to get help if concerned</li> <li>• <i>understand what computer networks do and how they provide multiple services</i></li> <li>• discern where it is best to use technology and where it adds little or no value</li> </ul>	<ul style="list-style-type: none"> <li>• <i>recognise acceptable and unacceptable behaviour using technology</i></li> <li>• appreciate the benefits of ICT to send messages and to communicate</li> <li>• use the automatic spell checker to edit spellings</li> <li>• use a search engine to find a specific website</li> </ul>	<ul style="list-style-type: none"> <li>• <i>understand that you have to make choices when using technology</i> and that not everything is true and/or safe</li> <li>• use instant messaging to communicate with class members</li> <li>• conduct a video chat with someone elsewhere in the</li> </ul>	<ul style="list-style-type: none"> <li>• discuss the risks of online use of technology</li> <li>• how to minimise risks</li> <li>• conduct a video chat with people in another country or organisation</li> <li>• contribute to discussions online</li> <li>• <i>use a search engine using keyword searches</i></li> </ul>

*Italics – Target Tracker Statements*

<ul style="list-style-type: none"> <li>• use the spacebar, back space, enter, shift and arrow keys</li> <li>• print out a page from the internet</li> <li>• <i>I can use a program to create a simple document</i></li> </ul>	<ul style="list-style-type: none"> <li>• highlight text to change its format (B, <u>U</u>, I)</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• use the email address book</li> <li>• open and send an attachment</li> <li>• find relevant information by browsing a menu</li> <li>• search for an image, then copy and paste it into a document</li> <li>• use 'Save picture as' to save an image to the computer</li> <li>• copy and paste text into a document</li> <li>• create a presentation that moves from slide to slide and is aimed at a specific audience</li> <li>• combine text, images and sounds and show awareness of audience</li> <li>• know how to manipulate text, underline text, centre text, change font and size and save text to a folder</li> </ul>	<ul style="list-style-type: none"> <li>• use tabbed browsing to open two or more web pages at the same time</li> <li>• open a link to a new window</li> <li>• open a document (PDF) and view it</li> <li>• create a lengthy presentation that moves from slide to slide and is aimed at a specific audience</li> <li>• insert sound recordings into a multimedia presentation</li> <li>• know how to manipulate text, underline text, centre text, change font and size and save text to a folder</li> </ul>	<p>school or in another school</p> <ul style="list-style-type: none"> <li>• <i>use a search engine using keyword searches</i></li> <li>• <i>compare the results of different searches</i></li> <li>• decide which sections are appropriate to copy and paste from at least two web pages</li> <li>• save stored information following simple lines of enquiry</li> <li>• download a document and save it to the computer</li> <li>• use a range of presentation applications</li> <li>• consider audience when editing a simple film</li> <li>• know how to prepare and then present a simple film</li> <li>• use ICT to record sounds and capture both still and video images</li> <li>• make a home page for a website that contains links to other pages</li> <li>• capture sounds, images and video</li> <li>• use the word count tool to check the length of a document</li> <li>• use bullets and numbering tools</li> </ul>	<ul style="list-style-type: none"> <li>• use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"</li> <li>• present a film for a specific audience and then adapt same film for a different audience</li> <li>• create a sophisticated multimedia presentation</li> <li>• confidently choose the correct page set up option when creating a document</li> <li>• confidently use text formatting tools, including heading and body text</li> <li>• use the 'hanging indent' tool to help format work where appropriate (e.g. a play script)</li> </ul>
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Online Safety					
Pupils will be taught to:					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Knowledge and understanding</b> <ul style="list-style-type: none"> <li>understand the different methods of communication (e.g. email, online forums etc)</li> <li>know you should only open email from a known source</li> <li>know the difference between email and communication systems such as blogs and wikis</li> <li>know that websites sometimes include pop-ups that take me away from the main site</li> <li>know that bookmarking is a way to find safe sites again quickly</li> <li>evaluate websites and know that everything on the internet is not true</li> <li>know that it is not always possible to copy some text and pictures from the internet</li> <li><i>know that personal information should not be shared online</i></li> <li>know they must tell a trusted adult immediately if anyone tries to meet them via the internet</li> <li><i>to tell an adult if I see anything worrying online</i></li> </ul> <b>Skills</b> <ul style="list-style-type: none"> <li>follow the school's safer internet rules</li> <li>use the search engines agreed by the school</li> <li>know what to do if they find something inappropriate online or something they are unsure of (including identifying people who can help; minimising screen; online reporting using school system etc.)</li> <li>use the internet for learning and communicating with others, making choices when navigating through sites</li> <li>recognise advertising on websites and learn to ignore it</li> <li>use a password to access the secure network</li> </ul>		<b>Knowledge and understanding</b> <ul style="list-style-type: none"> <li>understand the need for rules to keep them safe when exchanging learning and ideas online</li> <li><i>recognise that information on the internet may not be accurate or reliable</i> and may be used for bias, manipulation or persuasion</li> <li>understand that the internet contains fact, fiction and opinion and begin to distinguish between them</li> <li>use strategies to verify information, e.g. cross-checking</li> <li>understand the need for caution when using an internet search for images and what to do if they find an unsuitable image</li> <li>understand that copyright exists on most digital images, video and recorded music</li> <li><i>understand the need to keep personal information and passwords private</i></li> <li>understand that if they make personal information available online it may be seen and used by others</li> <li>know how to respond if asked for personal information or feel unsafe about content of a message</li> <li>recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy</li> <li>know how to report an incident of cyber bullying</li> <li>know the difference between online communication tools used in school and those used at home (filters)</li> <li>understand the need to develop an alias for some public online use</li> <li>understand that the outcome of internet searches at home may be different than at school</li> <li><i>know what to do if they see anything worrying online</i></li> </ul> <b>Skills</b> <ul style="list-style-type: none"> <li>follow the school's safer internet rules</li> </ul>		<b>Knowledge and understanding</b> <ul style="list-style-type: none"> <li><i>discuss the positive and negative impact of the use of ICT in their own life, and friends and family</i></li> <li><i>understand the potential risk of providing personal information online</i></li> <li>recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content</li> <li>understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented</li> <li>recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)</li> <li>understand that some material on the internet is copyrighted and may not be copied or downloaded</li> <li>understand that some messages may be malicious and know how to deal with this</li> <li>understand that online environments have security settings, which can be altered, to protect the user</li> <li>understand the benefits of developing a 'nickname' for online use</li> <li>understand that some malicious adults may use various techniques to make contact and elicit personal information</li> <li>know that it is unsafe to arrange to meet unknown people online</li> <li><i>know how to report any suspicions</i></li> <li>understand they should not publish other people's pictures or tag them on the internet without permission</li> <li>know that content put online is extremely difficult to remove</li> <li><i>know what to do if they discover something malicious or</i></li> </ul>	

	<ul style="list-style-type: none"> <li>• recognise the difference between the work of others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new</li> <li>• identify when emails should not be opened and when an attachment may not be safe</li> <li>• explain and demonstrate how to use email safely</li> <li>• use different search engines</li> </ul>	<p><i>inappropriate</i></p> <ul style="list-style-type: none"> <li>• <i>understand how to choose online content appropriate for my age group</i></li> </ul> <p><b>Skills</b></p> <ul style="list-style-type: none"> <li>• follow the school's safer internet rules</li> <li>• make safe choices about the use of technology</li> <li>• use technology in ways which minimises risk. e.g. responsible use of online discussions, etc</li> <li>• create strong passwords and manage them so that they remain strong</li> <li>• independently, and with regard for e-safety, select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school</li> <li>• competently use the internet as a search tool</li> <li>• use appropriate strategies for finding, critically evaluating, validating and verifying information. e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources</li> <li>• use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information</li> </ul>
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