

RFS- Knowledge Milestones & Skill Progression: Computing

Knowledge Milestones						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<u>Computer Science</u>	<u>Computer Science</u>	<u>Computer Science</u>	<u>Computer Science</u>	<u>Computer Science</u>	<u>Computer Science</u>
<p>Children are aware that some devices need commands to operate and control them, e.g., traffic lights, car park barrier, and games consoles.</p> <p>Understand what commands are needed to control different devices, e.g., make a noise to activate a toy; press a button to make it work.</p> <p>Be aware that the computer keyboard can be used to control objects on screen.</p> <p>Begin to understand that computers can represent real or imaginary situations.</p> <p>Be aware that different choices made using a program on the computer can produce different outcomes.</p> <p>Be aware that computers can make imaginary things happen on-screen, which may not happen in everyday life</p>	<p>Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that an algorithm written for a computer is called a program.</p> <p>Children can work out what is wrong with a simple algorithm when the steps are out of order, and can write their own simple algorithm, e.g. Colouring in a Bird activity. Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code.</p> <p>When looking at a program, children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program.</p> <p style="text-align: center;"><u>Information Technology</u></p> <p>Children are able to sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources.</p> <p style="text-align: center;"><u>Digital Literacy</u></p> <p>Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.</p> <p>Children understand the importance of keeping information, such as their usernames and passwords,</p>	<p>Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.</p> <p>Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors.</p> <p>Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.</p> <p style="text-align: center;"><u>Information Technology</u></p> <p>Children demonstrate an ability to organise data using a database and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions. Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.</p> <p style="text-align: center;"><u>Digital Literacy</u></p> <p>Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template. Children make links between technology they see around them, coding</p>	<p>Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.</p> <p>Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects. Children understand how variables can be used to store information while a program is executing.</p> <p>Children’s designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. They make good attempts to ‘step through’ more complex code in order to identify errors in algorithms and can correct this. e.g. traffic light algorithm.</p> <p>Children can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails. They can describe appropriate email conventions when communicating in this</p>	<p>When turning a real-life situation into an algorithm, the children’s design shows that they are thinking of the required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs.</p> <p>Children’s use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. They understand ‘if statements’ for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs.</p> <p>Children’s designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, ‘if’ statements, repetition and variables. They can trace code and use methods to identify errors in code and make logical attempts to correct this.</p> <p>Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the internet can be used to provide different methods of communication is improving.</p>	<p>Children may attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts.</p> <p>Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code.</p> <p>Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design.</p> <p>When children code, they are beginning to think about their code structure in terms of the ability to debug and interpret the code later, e.g. the use of tabs to organise code and the naming of variables.</p> <p style="text-align: center;"><u>Information Technology</u></p> <p>Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe.</p> <p>Children can select the most appropriate form of online communications contingent on audience and digital content.</p>	<p>Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. Children test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem.</p> <p>Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task in code. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions.</p> <p>Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.</p> <p>Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the internet in school.</p>



	<p>private and actively demonstrate this in lessons. Children take ownership of their work and save this.</p>	<p>and multimedia work they do in school e.g. animations, interactive code and programs.</p>	<p>way.</p> <p><u>Information Technology</u></p> <p>Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet and using a search engine.</p> <p>Children can collect, analyse, evaluate and present data and information using a selection of software. Children can consider what software is most appropriate for a given task. They can create purposeful content to attach to emails.</p> <p><u>Digital Literacy</u></p> <p>Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools. They know more than one way to report unacceptable content and contact.</p>	<p><u>Information Technology</u></p> <p>Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level.</p> <p>Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. They create linked content using a range of software. Children share digital content within their community.</p> <p><u>Digital Literacy</u></p> <p>Children can explore key concepts relating to online safety using concept mapping. They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact.</p>	<p><u>Digital Literacy</u></p> <p>Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.</p> <p>Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. e.g. creating their own program to meet a design brief. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content.</p> <p>Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.</p>	<p><u>Information Technology</u></p> <p>Children readily apply filters when searching for digital content. They are able to explain in detail how credible a webpage is and the information it contains. They compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. Children use critical thinking skills in everyday use of online communication.</p> <p>Children make clear connections to the audience when designing and creating digital content. The children design and create their own blogs to become a content creator on the internet. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.</p> <p><u>Digital Literacy</u></p> <p>Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking. They recognise the value in preserving their privacy when online for their own and other people’s safety.</p>
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Progression Skills						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><u>E-Safety</u></p> <p>Talk about good & bad choices in real life e.g. taking turns, saying kind things, helping others, telling an adult if something upsets you.</p> <p>Play appropriate games on the Internet.</p> <p>Talk about good and bad choices when using websites – being kind, telling a grown up if something upsets us and keeping ourselves safe by keeping information private.</p> <p><u>Programming</u></p> <p>Help adults operate equipment around the school, independently operating simple equipment.</p> <p>Use simple software to make things happen.</p> <p>Press buttons on a floor robot and talk about the movements.</p> <p>Explore options and make choices with toys, software and websites.</p> <p><u>Multimedia</u></p> <p>Use a mouse to rearrange objects and pictures on a screen.</p> <p>Recognise text, images and sound when using ICT.</p> <p>Use a camera or sound recorder to collect photos or sound.</p> <p>Use paint programs to create pictures.</p>	<p><u>E-Safety</u></p> <p>Understand they need to follow certain rules to remain safe when visiting places online.</p> <p>Begin to understand that if you create something you own it.</p> <p>Learn that many websites ask for information that is private & discuss how to responsibly handle such requests.</p> <p>Explore how email can be used to communicate with real people within their schools, families & communities.</p> <p>Learn that directory sites with alphabetical listings offer one way to find things on the Internet.</p> <p><u>Programming</u></p> <p>Physically follow & give each other instructions to move around.</p> <p>Explore outcomes when buttons are pressed in sequences on a robot.</p> <p>Begin to use software to create movement & patterns on a screen.</p> <p>Begin to identify an algorithm to achieve a specific purpose.</p> <p>Execute a program on a floor robot to achieve an algorithm.</p> <p>Use the word debug to correct any mistakes when programming a floor robot.</p> <p>Begin to predict what will happen for a short sequence of instructions in a program.</p>	<p><u>E-Safety</u></p> <p>Stay safe online by choosing websites that are good for them to visit & not inappropriate sites.</p> <p>Explore what cyber-bullying means & what to do when they encounter it.</p> <p>Know that if they put information online it leaves a digital footprint or “trail” & they need to manage it so it’s not hurtful.</p> <p>Understand that keyword searching is an effective way to locate online information & how to select keywords to produce the best search results.</p> <p>Discuss criteria for rating informational websites a site.</p> <p>Realise that not all websites are equally good sources of information.</p> <p><u>Programming</u></p> <p>Physically follow and give each other forward, backward & turn (right-angle) instructions.</p> <p>Articulate an algorithm to achieve a purpose.</p> <p>Plan and enter a sequence of instructions to achieve an algorithm, with a robot specifying distance & turn and drawing a trail.</p> <p>Explore outcomes when giving instructions in a simple Logo program.</p>	<p><u>E-Safety</u></p> <p>Agree sensible e-safety rules for the classroom.</p> <p>Choose a secure password for age-appropriate websites.</p> <p>Discuss what actions could be taken if they are uncomfortable or upset online e.g. Report Abuse button.</p> <p>Talk about what games they enjoying playing and what good choices are when playing games e.g. content, screen time.</p> <p>Use a class blog to share information and talk about who can see it, and how to communicate safely and respectfully.</p> <p>Comment and provide positive feedback on the work of classmates in school or online, or the work of others online.</p> <p><u>Programming</u></p> <p>Plan & enter a sequence of instructions on a robot specifying distance & turn to achieve specific outcomes, debug the sequence where necessary.</p> <p>Test & improve / debug programmed sequences.</p> <p>Begin to type logo commands to achieve outcomes.</p> <p>Explore outcomes when giving sequences of instructions in Logo software.</p> <p>Use repeat to achieve solutions to tasks.</p> <p>Solve open-ended problems with</p>	<p><u>E-Safety</u></p> <p>Agree sensible e-safety rules for the classroom.</p> <p>To understand the need for a secure password for age-appropriate websites.</p> <p>Discuss what actions could be taken if they are uncomfortable or upset online e.g. Report Abuse button.</p> <p>Talk about what games they enjoying playing and what good choices are when playing games e.g. content, screen time.</p> <p>Use a class blog to share information and talk about who can see it, and how to communicate safely and respectfully.</p> <p><u>Programming</u></p> <p>Create & edit procedures typing logo commands including pen up, pen down & changing the trail of the turtle.</p> <p>Use sensors to ‘trigger’ an action such as turning the lights on.</p> <p>Solve open-ended problems with a floor robot, Logo & other software using efficient procedures to create shapes & letters.</p> <p>Experience a variety of resources to extend knowledge & understanding of programming.</p> <p>Create an algorithm & a program that will use a simple selection command for a game.</p> <p>Begin to correct errors (debug) as they program devices and</p>	<p><u>E-Safety</u></p> <p>Agree sensible e-safety rules for the classroom.</p> <p>Discuss their own personal use of the Internet and choices they make.</p> <p>Discuss how to protect devices from virus threats.</p> <p>Discuss the importance of keeping an adult informed about what you’re doing online, and how to report concerns.</p> <p>Explore using the safe and responsible use of online communication tools e.g. blogs, messaging.</p> <p><u>Programming</u></p> <p>Explore procedures using repeat to achieve solutions to problems with Logo & a floor robot.</p> <p>Talk about procedures as parts of a program.</p> <p>Refine procedures to improve efficiency.</p> <p>Use a variable to replace number of sides in a regular shape.</p> <p>Explore instructions to control software or hardware with an input & using if... then... commands.</p> <p>Explore a computer model to control a physical system.</p> <p>Change inputs on a model to achieve different outputs.</p> <p>Refine & extend a program.</p> <p>Identify difficulties & articulate a</p>	<p><u>E-Safety</u></p> <p>Agree sensible e-safety rules for the classroom.</p> <p>Discuss their own personal use of the Internet and choices they make.</p> <p>Have a secure understanding of how to protect devices from virus threats.</p> <p>Discuss the importance of keeping an adult informed about what you’re doing online, and how to report concerns.</p> <p>Explore using the safe and responsible use of online communication tools e.g. blogs, messaging.</p> <p><u>Programming</u></p> <p>Record in some detail the steps (the algorithm) that are required to achieve an outcome & refer to this when programming.</p> <p>Predict the outputs for the steps in an algorithm.</p> <p>Increase confidence in the process to plan, program, test & review a program.</p> <p>Write a program which follows an algorithm to solve a problem for a floor robot or other model.</p> <p>Write a program which follows an algorithm to achieve a planned outcome for appropriate programming software.</p> <p>Control on screen mimics & physical devices using one or more input & predict the outputs.</p>



<p>Begin to use a keyboard to see programming.</p> <p>Develop an interest in ICT by using age appropriate websites or programs.</p> <p><u>Technology in Our Lives</u></p> <p>Recognise purposes for using technology in school and at home.</p> <p>Understand that things they create belong to them and can be shared with others using technology.</p> <p>Recognise that they can use the Internet to play and learn.</p> <p><u>Data Handling</u></p> <p>Collect information as photos or sound files.</p> <p>Use a simple pictogram or set of photos to count and organise information.</p>	<p><u>Multimedia</u></p> <p>Record their own voices and play back to an audience.</p> <p>Use a video or stills camera to record an activity.</p> <p>Create sounds and simple music phrases using ICT tools.</p> <p>Add text and images to a template document using an image & word bank.</p> <p>Use index fingers (left and right hand) on a keyboard to build words & sentences.</p> <p>Know when & how to use the SPACE BAR (thumbs) to make spaces between words.</p> <p><u>Technology in Our Lives</u></p> <p>Recognise uses of technology in their homes and in their community.</p> <p>Understand that there are online tools that can help them create and communicate.</p> <p><u>Data Handlin</u></p> <p>Take photographs, video and record sound to record learning experiences.</p> <p>Look at how data is representing digitally.</p> <p>Contribute to and interpret a pictogram.</p>	<p>Watch a Logo program execute & debug any problems.</p> <p>Predict what will happen & test results.</p> <p>Talk about similarities & differences between floor robots and logo on screen.</p> <p><u>Multimedia</u></p> <p>Use an increasing variety of tools and effects in paint programs and talk about their choices.</p> <p>Use templates to make electronic books individually and in pairs.</p> <p>Explore the effects of sound and music in animation and video.</p> <p>Create own documents, adding text and images.</p> <p>Use keyboard to enter text (index fingers left & right hand). Know when and how to use the RETURN/ ENTER key. Use SHIFT & CAPS LOCK to enter capital letters. Use DELETE & BACKSPACE buttons to correct text. Create sentences, SAVE & edit later.</p> <p><u>Technology in Our Lives</u></p> <p>Begin to understand there are a variety of sources of information and begin to recognise the differences.</p> <p>Begin to understand what the Internet is and the purposes that it is used for.</p> <p>Understand the different types of content on websites and that some things may not be true or accurate.</p>	<p>a floor robot & Logo including creating simple regular polygons, making sounds & planning movements such as a dance.</p> <p>Create an algorithm to tell a joke or a simple story.</p> <p>Sequence pre-written lines of programming into order.</p> <p>Talk about algorithms planned by others & identify any problems & the expected outcome.</p> <p><u>Multimedia</u></p> <p>Explore & begin to evaluate the use of multimedia to enhance communication.</p> <p>Create & begin to edit presentation documents & text, experimenting with fonts, size, colour, alignment for emphasis & effect.</p> <p>Use a range of effects in art programs including brush sizes, repeats, reflections.</p> <p>Explore the use of video, animation & green screening.</p> <p>Use ICT tools to create musical phrases.</p> <p>Amend text & save changes.</p> <p>Use individual fingers to input text & use SHIFT key to type characters.</p> <p>Amend text by highlighting & using SELECT/ DELETE & COPY/ PASTE.</p> <p>Look at own work & consider how it can be improved for effectiveness.</p> <p><u>Technology in Our Lives</u></p> <p>Save work on the school network, on the Internet and on</p>	<p>actions on screen, and identify bugs in programs written by others.</p> <p>Use an algorithm to sequence. more complex programming into order.</p> <p>Link the use of algorithms to solve problems to work in Maths, Science & DT.</p> <p><u>Multimedia</u></p> <p>Explore how multimedia can create atmosphere & appeal to different audiences.</p> <p>Be confident in creating & modifying text & presentation documents to achieve a specific purpose.</p> <p>Use art programs & online tools to modify photos for a specific purpose using a range of effects.</p> <p>Explore the use of video, animation, & green screening for a specific audience.</p> <p>Use ICT tools to create music phrases for a specific purpose.</p> <p>Use a keyboard effectively, including the use of keyboard shortcuts.</p> <p>Use font sizes & effects such as bullet points appropriately.</p> <p>Know how to use a spell check.</p> <p>Look at their own, and a friend’s work & provide feedback that is constructive & specific.</p> <p><u>Technology in Our Lives</u></p> <p>Talk about the school network & the different resources they can access, including the Internet.</p> <p>Frame questions & identify key words to search for information on the Internet.</p>	<p>solution for errors in a program.</p> <p>Group commands as a procedure to achieve a specific outcome within a program.</p> <p>Write down the steps required (an algorithm) to achieve the outcome that is wanted and refer to this when programming.</p> <p><u>Multimedia</u></p> <p>Select an appropriate ICT or online tool to create and share ideas.</p> <p>Explore the effects of multimedia (photos, video, sound) in a presentation or video and show how they can be modified.</p> <p>Develop skills using transitions and hyperlinks to enhance the stricture of presentations.</p> <p>Use a wide range of effects in art programs and online tools, discussing the choices made and their effectiveness.</p> <p>Know how to use text and video</p> <p>Editing tools in programs to refine their work.</p> <p>Use online tools to create and share presentations and films.</p> <p><u>Technology in Our Lives</u></p> <p>Identify different parts of computing devices.</p> <p>Identify different parts of the Internet.</p> <p>Choose appropriate tools for communication and collaboration and use them responsibly.</p> <p>Use effective strategies to search with appropriate search engines.</p>	<p>Understand how sensors can be used to measure input in order to activate a procedure or sequence & talk about applications in society.</p> <p>Create variables to provide a score/trigger an action in a game Link errors in a program to problems in the original algorithm.</p> <p><u>Multimedia</u></p> <p>Identify the purpose for selecting an appropriate online tool.</p> <p>Discuss audience, atmosphere and structure of a presentation or video.</p> <p>Collect information and media from a range of sources (considering copyright issues) into a presentation for a specific audience.</p> <p>Use sound, images, text, transitions, hyperlinks and HTML code effectively in presentations.</p> <p>Store presentations and videos online where they can be accessed by themselves and shared with others.</p> <p>Evaluate the effectiveness of their own work and the work of others.</p> <p><u>Technology in Our Lives</u></p> <p>Describe different services provided by the Internet & how information moves around the Internet.</p> <p>Describe different parts of a computing device & how it connects to the Internet.</p> <p>Connect a computing device to a keyboard, mouse or printer.</p>
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		<p>Data Handling</p> <p>Take and save photographs, video & record sound to capture learning.</p> <p>Use microscopes or other devices to capture and save magnified images.</p> <p>Ask questions and consider how they will collect information.</p> <p>Collect data, generate graphs and charts to find answers.</p> <p>Save & retrieve the data to show to others.</p> <p>Create paper/ object decision trees & explore a branching database.</p> <p>Investigate different types of digital data e.g. online encyclopaedias.</p>	<p>individual devices.</p> <p>Talk about the parts of a computer.</p> <p>Use appropriate tools to collaborate on-line.</p> <p>Use appropriate tools to communicate on-line.</p> <p>Use simple search tools and find appropriate websites.</p> <p>Talk about the owner of information online.</p> <p>Data Handling</p> <p>Find out information from a pre-prepared database, asking straightforward questions.</p> <p>Contribute towards a database. Construct and use a branching database.</p> <p>Record data in a variety of ways. Present data for others.</p> <p>Use a data logger to monitor changes and talk about the outcomes seen.</p>	<p>Consider reliability of information & ways it may influence you.</p> <p>Check who the owner is before copying photos, clipart or text.</p> <p>Data Handling</p> <p>Plan and create a database to answer questions.</p> <p>Identify different types of data.</p> <p>Ask questions carrying out simple searches on a database.</p> <p>Identify inaccurate data.</p> <p>Present data in appropriate format for an audience.</p> <p>Use a data logger to record and compare individual readings.</p>	<p>Talk about the different elements on web pages.</p> <p>Find out who the information presented on a webpage belongs to.</p> <p>Data Handling</p> <p>Collect and record information using spreadsheets and databases.</p> <p>Carry out complex searches (e.g. using and/or; \leq / \geq).</p> <p>Solve problems and present answers using data tools.</p> <p>Analyse information and question data.</p> <p>Identify poor quality data.</p> <p>Select appropriate use of a data logger for an investigation and interpret the findings</p>	<p>Identify appropriate forms of online communication for different audiences.</p> <p>Use search engines as part of an effective research strategy. Describe how search results are selected & ranked.</p> <p>Acknowledge who resources belong to that they have found on the internet.</p> <p>Data Handling</p> <p>Use the whole data process – generate, process, interpret, store, and present information – realising the need for accuracy and checking plausibility.</p> <p>Select appropriate data tool.</p> <p>Identify and present results.</p> <p>Interrogate a database, refining searches to provide answers to questions.</p> <p>Plan investigations using the outcomes from a data logger to show findings.</p>
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