

## Key Stage 2 Computing Skills Progression

### National Curriculum Objectives

By the end of KS2 pupil 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
  - use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

National Curriculum	Year 3	Year 4	Year 5	Year 6
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	<p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems</p>	<ul style="list-style-type: none"> <li>• Create a sequence of commands using a <b>block language</b> to produce a given outcome</li> <li>• Debug errors to accomplish specific goal</li> </ul>	<ul style="list-style-type: none"> <li>• Plan a program using a <b>block language</b> which includes appropriate loops to produce a given outcome</li> <li>• Debug errors in increasingly complex programs to accomplish specific goal</li> </ul>	<ul style="list-style-type: none"> <li>• Plan a program which includes selection to produce a given outcome</li> <li>• Debug errors in increasingly complex programs to accomplish specific goal</li> </ul>	<ul style="list-style-type: none"> <li>• Plan a program which includes variables to produce a given outcome</li> <li>• Debug errors in increasingly complex programs to accomplish specific goal</li> </ul>
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	<p>Solve problems by decomposing them into smaller parts</p>	<ul style="list-style-type: none"> <li>• Work with others to decompose a problem into smaller steps in planning a project</li> </ul>	<ul style="list-style-type: none"> <li>• Independently decompose a problem into smaller steps in planning a project</li> </ul>	<ul style="list-style-type: none"> <li>• Plan a solution to a problem using decomposition</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems using decomposition, tackling each part separately</li> </ul>
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	<p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p>	<ul style="list-style-type: none"> <li>• Explain the order (<b>sequence</b>) of commands can effect the outcome (same commands, different order -&gt; same or different outcome)</li> <li>• Identify different <b>sequences</b> can achieve the same outcome</li> </ul>	<ul style="list-style-type: none"> <li>• Identify patterns (<b>repetition</b>) in a <b>sequence</b></li> <li>• Understand repetition in programming is also called looping</li> <li>• Identify a loop in a program</li> <li>• Understand, identify and justify when to use 'infinite' or 'count-controlled' loops</li> <li>• Explain the importance in instruction order in a loop</li> </ul>	<ul style="list-style-type: none"> <li>• Define that conditional statements (<b>selection</b>) are used in computer programs</li> <li>• Explain a loop can stop when a condition is met (number of times or event)</li> <li>• Explain a that program flow can branch according to a condition</li> <li>• Use a condition in an <i>if...then...</i> statement to produce a given outcome</li> </ul>	<ul style="list-style-type: none"> <li>• Define 'variable' as something that is changeable</li> <li>• Explain that a variable has a name and a value</li> <li>• Identify a variable in an existing program</li> <li>• Use a variable in a conditional statement to control the flow of a program</li> </ul>
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	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	<ul style="list-style-type: none"> <li>• Explain simple, sequence-based algorithm independently</li> <li>• Use logical reasoning to detect errors in programs</li> </ul>	<ul style="list-style-type: none"> <li>• Explain an algorithm using sequence and repetition independently</li> <li>• Use logical reasoning to detect and correct errors in programs</li> </ul>	<ul style="list-style-type: none"> <li>• Explain an algorithm using sequence, repetition and selection independently</li> <li>• Use logical reasoning to detect errors in increasingly complex programs</li> </ul>	<ul style="list-style-type: none"> <li>• Clearly and concisely explain algorithms using sequence, repetition, selection and variables independently</li> <li>• Use logical reasoning to detect errors in increasingly complex programs</li> </ul>
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National Curriculum		Year 3	Year 4	Year 5	Year 6
	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content	<ul style="list-style-type: none"> <li>• Search for information in a single site</li> <li>• Understand that search engines select pages according to keywords found in the content</li> </ul>	<ul style="list-style-type: none"> <li>• Use a standard search engine to find information</li> <li>• Understand that search engines rank pages according to relevance.</li> </ul>	<ul style="list-style-type: none"> <li>• Use filters to make more effective use of a standard search engine</li> <li>• Understand that search engines use a cached copy of the crawled web to select and rank results</li> </ul>	<ul style="list-style-type: none"> <li>• Use of a range of search engines appropriate to finding information that is required</li> <li>• Understand that search engines rank pages based on the number and quality of in bound links</li> </ul>

		<p>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</p> <p>Use microsoft platforms such as word, powerpoint...</p>	<ul style="list-style-type: none"> <li>• Combine text and images to share a message</li> <li>• Consider how different layouts can suit different purposes</li> <li>• Type with increased confidence and speed using age appropriate punctuation</li> <li>• Use return to create paragraphs</li> <li>• Change orientation of text</li> <li>• Wrap text around an image</li> <li>• Recognise a document can be formatted with placeholders</li> </ul>	<p>Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3</p>	<p>Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3</p>	<ul style="list-style-type: none"> <li>• Recognise components of a webpage layout</li> <li>• Create a webpage including text, images, hyperlinks and embedded content</li> <li>• Understand the need for a navigation path</li> </ul>
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				<ul style="list-style-type: none"> <li>• Change orientation of images</li> </ul>	<ul style="list-style-type: none"> <li>• Use a computer to (further) manipulate images</li> <li>• Recognise images can be changed for different purposes</li> <li>• Use the most appropriate tool for a particular purpose</li> <li>• Consider the impact of changes made on the quality of the image</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise an image is comprised of separate objects</li> <li>• Add, remove, modify and combine objects to create graphical drawing on a computer</li> <li>• Recognise objects are layered</li> <li>• Recognise that objects can be modified in groups</li> <li>• Consider the impact of choices made</li> </ul>	
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			<ul style="list-style-type: none"> <li>• Understand animation is a sequence of drawings or photographs</li> <li>• Relate animated movement with a sequence of images</li> <li>• Plan an animation</li> <li>• Review and improve an animation</li> <li>• Evaluate the impact of adding other media to an animation</li> </ul>	<ul style="list-style-type: none"> <li>• Press/tap buttons to start and stop recordings</li> <li>• Recognise recorded audio is stored as a file</li> <li>• Edit and alter recorded audio</li> <li>• Layer sounds</li> <li>• Save/export an audio file</li> <li>• Consider the results of editing choices made</li> </ul>	<ul style="list-style-type: none"> <li>• Identify the features of a good video</li> <li>• Plan a video production using a story board</li> <li>• Use a computer to make a video</li> <li>• Recognise a video can be improved through editing</li> <li>• Consider the impact of changes made on the quality of the Video</li> </ul>	<p>Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 5</p>
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		<p>Collecting, analysing, evaluating and presenting data and information</p>	<ul style="list-style-type: none"> <li>• Identify object attributes needed to collect relevant data</li> <li>• Create a branching database</li> <li>• Identify objects using a branching database</li> <li>• Compare information shown in a pictogram with a branching database</li> <li>• Explain that data can be used to answer questions</li> </ul>	<ul style="list-style-type: none"> <li>• Collect data using a digital device</li> <li>• Recognise that a sensor can be used as an input device for data collection</li> <li>• Use a larger data set to find information</li> <li>• Use a computer program to sort data by one attribute</li> <li>• Export information and present data in a table and a graph</li> </ul>	<ul style="list-style-type: none"> <li>• Use a form to collect information</li> <li>• Navigate a flat-file database</li> <li>• Apply knowledge of a database to ask and answer real-world questions</li> <li>• Design a structure for a flat-file database</li> <li>• Choose tools to select and analyse data to answer questions</li> <li>• Select an appropriate graph to visually compare data</li> <li>• Choose suitable ways to present information</li> </ul>	<ul style="list-style-type: none"> <li>• Identify questions that can be answered using data</li> <li>• Create a spreadsheet for a purpose</li> <li>• Apply a formula that can be used to produce calculated data</li> <li>• Recognise data can be calculated using different operations</li> <li>• Evaluate results in comparison to the question asked</li> <li>• Choose suitable ways to presents data</li> </ul>
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		<p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>See related document: Online Safety Skills Progression (Education for a Connected World / Project Evolve. See extended Online safety planning.</p>
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		<p>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</p>	<ul style="list-style-type: none"> <li>• Explain how a computer network can be used to share information</li> <li>• Explore how digital devices can be connected</li> <li>• Recognise the physical components of a network</li> <li>• Explain how digital devices function</li> <li>• Identify input and output devices</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how networks physically connect to other networks</li> <li>• Recognise how networked devices make up the internet</li> <li>• describe how content can be added and accessed on the World Wide Web</li> <li>• Recognise how the content of the WWW is created and shared by people</li> <li>• Describe the current limitations of World Wide Web media</li> </ul>	<ul style="list-style-type: none"> <li>• Explain that computers can be connected together to form systems</li> <li>• Recognise the role of computer systems in our lives</li> <li>• Recognise how information is transferred over the internet</li> <li>• Explain how sharing information online lets people in different places work together</li> <li>• Contribute to a shared project online</li> <li>• Evaluate different ways of working together online</li> </ul>	<p>Continue to develop online searching skills to enhance online communication and collaboration</p>
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