

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
Programming	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems	<ul style="list-style-type: none"> • Create a sequence of commands using a block language to produce a given outcome • Debug errors to accomplish specific goal 	<ul style="list-style-type: none"> • Plan a program using a block language which includes appropriate loops to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal 	<ul style="list-style-type: none"> • Plan a program which includes selection to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal 	<ul style="list-style-type: none"> • Plan a program which includes variables to produce a given outcome • Debug errors in increasingly complex programs to accomplish specific goal

	Solve problems by decomposing them into smaller parts	<ul style="list-style-type: none"> • Work with others to decompose a problem into smaller steps in planning a project 	<ul style="list-style-type: none"> • Independently decompose a problem into smaller steps in planning a project 	<ul style="list-style-type: none"> • Plan a solution to a problem using decomposition 	<ul style="list-style-type: none"> • Solve problems using decomposition, tackling each part separately
	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	<ul style="list-style-type: none"> • Explain the order (sequence) of commands can effect the outcome (same commands, different order -> same or different outcome) • Identify different sequences can achieve the same outcome 	<ul style="list-style-type: none"> • Identify patterns (repetition) in a sequence • Understand repetition in programming is also called looping • Identify a loop in a program • Understand, identify and justify when to use 'infinite' or 'count-controlled' loops • Explain the importance in instruction order in a loop 	<ul style="list-style-type: none"> • Define that conditional statements (selection) are used in computer programs • Explain a loop can stop when a condition is met (number of times or event) • Explain a that program flow can branch according to a condition • Use a condition in an <i>if...then...</i> statement to produce a given outcome 	<ul style="list-style-type: none"> • Define 'variable' as something that is changeable • Explain that a variable has a name and a value • Identify a variable in an existing program • Use a variable in a conditional statement to control the flow of a program

	<p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</p>	<ul style="list-style-type: none"> • Explain simple, sequence-based algorithm independently • Use logical reasoning to detect errors in programs 	<ul style="list-style-type: none"> • Explain an algorithm using sequence and repetition independently • Use logical reasoning to detect and correct errors in programs 	<ul style="list-style-type: none"> • Explain an algorithm using sequence, repetition and selection independently • Use logical reasoning to detect errors in increasingly complex programs 	<ul style="list-style-type: none"> • Clearly and concisely explain algorithms using sequence, repetition, selection and variables independently • Use logical reasoning to detect errors in increasingly complex programs
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National Curriculum			Year 3	Year 4	Year 5	Year 6
Information Technology	Digital Research		<ul style="list-style-type: none"> • Search for information in a single site • Understand that search engines select pages according to keywords found in the content 	<ul style="list-style-type: none"> • Use a standard search engine to find information • Understand that search engines rank pages according to relevance. 	<ul style="list-style-type: none"> • Use filters to make more effective use of a standard search engine • Understand that search engines use a cached copy of the crawled web to select and rank results 	<ul style="list-style-type: none"> • Use of a range of search engines appropriate to finding information that is required • Understand that search engines rank pages based on the number and quality of in-bound links
	Creating Digital Content	Text	<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> <ul style="list-style-type: none"> • Combine text and images to share a message • Consider how different layouts can suit different purposes • Type with increased confidence and speed using age-appropriate punctuation • Use return to create paragraphs • Change orientation of text • Wrap text around an image • Recognise a document can be formatted with placeholders 	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 3	<ul style="list-style-type: none"> • Recognise components of a webpage layout • Create a webpage including text, images, hyperlinks and embedded content • Understand the need for a navigation path

		Images		<ul style="list-style-type: none"> • Change orientation of images 	<ul style="list-style-type: none"> • Use a computer to (further) manipulate images • Recognise images can be changed for different purposes • Use the most appropriate tool for a particular purpose • Consider the impact of changes made on the quality of the image 	<ul style="list-style-type: none"> • Recognise an image is comprised of separate objects • Add, remove, modify and combine objects to create graphical drawing on a computer • Recognise objects are layered • Recognise that objects can be modified in groups • Consider the impact of choices made 	<ul style="list-style-type: none"> • Create 3D graphical objects on a computer • Alter the view of a 3D space • Modify 3D objects • Combine 3D objects to create desired effect • Apply blank 3D objects as placeholders to create holes
		Multimedia		<ul style="list-style-type: none"> • Understand animation is a sequence of drawings or photographs • Relate animated movement with a sequence of images • Plan an animation • Review and improve an animation • Evaluate the impact of adding other media to an animation 	<ul style="list-style-type: none"> • Press/tap buttons to start and stop recordings • Recognise recorded audio is stored as a file • Edit and alter recorded audio • Layer sounds • Save/export an audio file • Consider the results of editing choices made 	<ul style="list-style-type: none"> • Identify the features of a good video • Plan a video production using a story board • Use a computer to make a video • Recognise a video can be improved through editing • Consider the impact of changes made on the quality of the video 	Use cross-curricular opportunities to consolidate previous learning from Year 1 – Year 5

	Data Handling	Collecting, analysing, evaluating and presenting data and information	<ul style="list-style-type: none"> • Identify object attributes needed to collect relevant data • Create a branching database • Identify objects using a branching database • Compare information shown in a pictogram with a branching database • Explain that data can be used to answer questions 	<ul style="list-style-type: none"> • Collect data using a digital device • Recognise that a sensor can be used as an input device for data collection • Use a larger data set to find information • Use a computer program to sort data by one attribute • Export information and present data in a table and a graph 	<ul style="list-style-type: none"> • Use a form to collect information • Navigate a flat-file database • Apply knowledge of a database to ask and answer real-world questions • Design a structure for a flat-file database • Choose tools to select and analyse data to answer questions • Select an appropriate graph to visually compare data • Choose suitable ways to present information 	<ul style="list-style-type: none"> • Identify questions that can be answered using data • Create a spreadsheet for a purpose • Apply a formula that can be used to produce calculated data • Recognise data can be calculated using different operations • Evaluate results in comparison to the question asked • Choose suitable ways to presents data
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National Curriculum			Year 3	Year 4	Year 5	Year 6
Digital Literacy	Online Safety	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	See related document: Online Safety Skills Progression (Education for a Connected World)			
	Computing Systems and Networks	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	<ul style="list-style-type: none"> • Explain how a computer network can be used to share information • Explore how digital devices can be connected • Recognise the physical components of a network • Explain how digital devices function • Identify input and output devices 	<ul style="list-style-type: none"> • Describe how networks physically connect to other networks • Recognise how networked devices make up the internet • describe how content can be added and accessed on the World Wide Web • Recognise how the content of the WWW is created and shared by people • Describe the current limitations of World Wide Web media 	<ul style="list-style-type: none"> • Explain that computers can be connected together to form systems • Recognise the role of computer systems in our lives • Recognise how information is transferred over the internet • Explain how sharing information online lets people in different places work together • Contribute to a shared project online • Evaluate different ways of working together online 	Continue to develop online searching skills to enhance online communication and collaboration