



## Computing Progression of Skills and Knowledge

### National Curriculum 2014

#### Aims:

The National Curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

#### 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 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
- use technology safely, respectfully and responsibly; recognise

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				acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	
Progression of Skills and Understanding: Computer Science					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Give simple instructions to control a device, like a 'floor' robot, or on-screen object.	Give a set of simple instructions to program (control) a device, like a 'floor' robot, or on-screen object.				
Use trial and error to produce an accurate set of simple instructions, to control a floor 'robot' or on-screen object.	Use trial and error to produce an accurate set of 'instructions' to control a floor 'robot' or on-screen object; refine (de-bug) and improve / make changes.	Demonstrate logical 'trial and error' when using a computer simulation, 'model' or game, and predicts some consequences of decisions/choices made.	Demonstrate logical choices and prediction when using a computer simulation, 'model' or game and can make simple edits to solve a problem.		
Name some digital devices that need precise instructions (algorithms) to work / be controlled.	Talk about some electronic devices and understands that they need precise instructions (algorithms) to work / be programmed (controlled).	Produce an accurate set of simple instructions (code), to program (control) an on-screen object (or floor 'robot'), using trial and error to debug.  Talk about how the sequence of events in some simple instructions (algorithms) or code are 'working'.	Produce, debug and edit an accurate sequence of instructions, include use of repeat, to control on- screen objects.  Plan and create a program using decomposition; includes the use of selection (IF/ELSE) and/or variables.	Test, debug and edit a program that accomplishes a given goal, (simple computer 'game' or model or simulation), to solve a problem.  Create an accurate program to accomplish a given goal, including the use of repetition (loops), selection (IF/ELSE) and variables.	Test, debug and edit a program that accomplishes a given goal, (simple computer 'game' or model or simulation), to solve a problem.  Create & develop programs, by planning, debugging and applying programming skills of repetition (loops), selection (IF/ELSE) and variables, to accomplish specific goals.
Understand that software may represent a fantasy situation and can make sensible (logical) decisions/choices when	Demonstrate logical 'trial and error' when using a computer simulation or game, and predicts the consequences of	Talk about some digital devices beyond school that need precise instructions (algorithms) to work / be programmed	Talk about different types of input options e.g. motion /touch, microphone, data logging sensor; and output options e.g.	Use logical reasoning to deconstruct programs, evaluate their effectiveness and make them more challenging and / or 'elegant' /	Use logical reasoning to deconstruct programs, evaluate their effectiveness and make them more challenging and / or 'elegant' /

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<p>'playing' a straight- forward 'game'.</p>	<p>decisions/choices made.</p>	<p>(controlled).</p>	<p>switch, speakers, screen, etc.</p>	<p>efficient.  Use different types of input options and output options such as through sensing and control 'kits' and/or software, to solve a problem.  Has an understanding of computer networks (local, internet services and WWW).</p>	<p>efficient.  Use different types of input options and output options such as through sensing and control 'kits' and/or software to solve a problem.  Has an understanding of computer networks (local, internet services and WWW).</p>
<p>Understand some basic computing terms and concepts, such as algorithm, program, sequence, etc.</p>	<p>Understand some basic computing terms and concepts, such as: (school) network, algorithm, program, debug, editing, website, etc.</p>	<p>Know some relevant computing terms such as computer network, Internet, algorithm, program, World Wide Web, website, etc.</p>	<p>Develop and use a wider computing 'vocabulary' relevant to work, such as de-bug, Apps, data logging, search engine, spam, Wiki, etc.</p>	<p>Develop and use a wider computing 'vocabulary' in context of task, such as search engine, URL, variable, validate, digital footprint, spam, Wiki, etc.</p>	<p>Develop and use a wider computing 'vocabulary' in context of task, such as search engine, URL, HTML, https, variable, validate, digital footprint, etc.</p>
<p><b>Progression of Skills and Understanding: Information Technology</b></p>					
<p><b>Year 1</b></p>	<p><b>Year 2</b></p>	<p><b>Year 3</b></p>	<p><b>Year 4</b></p>	<p><b>Year 5</b></p>	<p><b>Year 6</b></p>

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<p>Use a mouse, finger etc. to select &amp; move items on the screen, assembling or matching objects.</p> <p>Take a digital picture or video clip, or record a sound, as part of a task.</p> <p>Use some software to create / assemble digital content for clear purpose, (could be text, images, animation, graph, sound, etc.).</p>	<p>Use some software to create / assemble digital content for clear purpose, (could be text, images, animation, graph, sound, etc.)</p>	<p>Use some software to create / assemble digital content for clear purpose, (could be text, images, animation, graph, sound, etc.)</p>	<p>Use software to create and combine content (be it text, pictures / images, graphs, animation, podcast etc.) for meaningful purpose(s).</p>	<p>Use software effectively to create, design and manipulate for purposeful outcomes, such as DT, art or music projects.</p>	<p>Use software effectively to create, design and manipulate for purposeful outcomes, such as DT, art or music projects.</p>
<p>Make straight-forward edits of their digital work (text, image, sound etc.) using simple editing tools, to both correct or improve it.</p>	<p>Make straight-forward edits of their digital work (text, image, sound etc.) using simple editing tools, to both correct or improve it.</p>	<p>Make straight-forward edits of their digital work (text, image, sound etc.) using simple editing tools, to both correct and improve it.</p> <p>Create and amend a (multi-media) resource that shows a sense of 'audience'.</p>	<p>Edit and amend their digital work (text, image, sound etc.) using simple editing tools, to both correct and improve it.</p> <p>Create and amend a multi-media resource that shows a sense of 'audience'.</p>	<p>Combine resources from different sources into a digital presentation, showing clear sense of intended purpose and 'audience'.</p>	<p>Combine resources from different sources into a digital presentation, evaluate it, and show clearly intended purpose and 'audience'</p>

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<p>Access a resource and then find answers to straight-forward questions.</p> <p>Recognise and talk about some common uses of IT in the world around them.</p>	<p>Navigate their way within some straight- forward digital content, such as selected history content, to find some specific information.</p> <p>Create and amend a (multi-media) resource for a clear purpose, starting to show a sense of the 'audience'.</p> <p>Create &amp; store some data, (simple data file), and then find answers to straight-forward questions.</p> <p>Recognise and talk about some common uses of IT in the world around them.</p>	<p>Navigate their way within some straight- forward digital content, such as selected history content, to find some specific information.</p> <p>Create &amp; store some data, (simple data file), and then find answers to straight-forward questions.</p> <p>Recognise and talk about some common uses of ICT in the world around them.</p>	<p>Navigate their way within range of (selected) online content, to find specific information.</p> <p>Include some information / content from an online resource within a 'presentation'.</p> <p>Use a data file to find answers to straight- forward questions, (such as through data logging or a survey or a prepared database or a simple spreadsheet, etc.).</p>	<p>Find specific and valid information (i.e. be discerning) using sensible key words / search terms, from (selected) online web content, as fits the task.</p> <p>Collect, analyse and draw conclusions from data, (such as through data logging or a survey or a prepared database or through manipulating a spreadsheet, etc.)</p>	<p>Find valid information using sensible key words / search terms, from a range of online web content, as fits the task.</p> <p>Collect, analyse, evaluate and draw conclusions from data, such as through survey, database or spreadsheet, etc.</p>
<p>Save and retrieve some work (and print if appropriate to task).</p>	<p>Save and retrieve work (and print if appropriate to task).</p>	<p>Save and retrieve work from electronic folders (and print if appropriate to task).</p>	<p>Save and retrieve work from electronic folders (and print if appropriate to task).</p>	<p>Save and retrieve work from various electronic folders on network (and controlled online environments where relevant).</p>	<p>Save and retrieve work from various electronic folders on network (and controlled online environments where relevant).</p>

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Progression of Skills and Understanding: Using Technology Safely (Digital Literacy)					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Know about the Internet and beginning to understand some key, age appropriate, and safety 'rules'.</p> <p>Share some information with others, (such as via. school network, in school MLE, via. a 'closed' blog).</p> <p>Find some straight- forward information from a 'safe', selected online resource.</p>	<p>Talk about key online safety 'rules' and knows where to go / report if a problem.</p> <p>Create and share some information online, (such as in school MLE, 'closed' email system or blog), understanding need to be respectful and safe.</p> <p>Find some straight- forward information from (selected) website resource(s) and knows not all websites 'good to use'.</p>	<p>Talk about key online safety 'rules' and knows where to go / report if a problem.</p> <p>Create and share some information online (such as in school MLE, email/blog), understanding need to be respectful and safe.</p> <p>Find some straight- forward information from (selected) website resource(s) and knows not all websites 'good to use'.</p>	<p>Talk about key online safety 'rules', knows what may be unacceptable behaviour, and knows where to go / report if a problem.</p> <p>Create and share some information online (such as school MLE, email / blog), demonstrating need to be respectful and safe.</p> <p>Find straight-forward information from (selected) website resource(s) and knows sites can contain, true or false facts, or opinion.</p>	<p>Talk about key online safety 'rules', knows what may be unacceptable behaviour, and knows where to go / report if a problem.</p> <p>Demonstrate 'web- savvy' awareness, from a range of given scenarios, including conduct, contact and content 'risks' and issues.</p> <p>Communicate and collaborate online (such as in MLE blog/Wiki /forum), demonstrating respectful and safe behaviours.</p> <p>Understand some simple steps to 'validate' information found on the Web, and appreciate how search results are selected and ranked.</p>	<p>Demonstrate 'web- savvy' awareness, from a range of given scenarios, including conduct, contact and content 'risks' and issues.</p> <p>Discuss range of eSafety and eSecurity (privacy) issues and knows range of ways to report concerns or inappropriate behaviour.</p> <p>Communicate and collaborate online (such as in MLE blog/Wiki /forum), demonstrating respectful and safe behaviours.</p> <p>Check the results of web searches i.e. how useful, relevant, reasonable, valid, accurate, and appreciates how search results are selected &amp; ranked.</p>