

Coughton Computing Curriculum

The new Computing Curriculum 2014 is split into 3 main areas of learning:

1. Computer Science (CS)
2. Information Technology (IT)
3. Digital Literacy (DL)

Computing is concerned with how computers and computer systems work, and how they are designed and programmed.

The core of computing is **computer science**, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use **information technology** to create programs, systems and a range of content. Computing also ensures that pupils become **digitally literate** – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims:

[All pupils] can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. (CS)

[All pupils] can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems. (CS)

[All pupils] can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. (IT)

[All pupils] are responsible, competent, confident and creative users of information and communication technology. (DL) It's worth noting that computer science aims to cover two distinct, but related, aspects.

There's a focus on computer science itself (the ideas and principles that underpin how digital technology works) but this sits alongside the practical experience of programming, almost certainly the best way for primary pupils to learn about computer science.

There is a statutory duty to offer a broad and balanced curriculum that prepares pupils to 'use **computational thinking** and creativity to understand and change the world'.

See <http://www.computingschool.org.uk/data/uploads/CASPrimaryComputing.pdf> for more detail.

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A big focus on computational thinking has been placed in the new curriculum.

What is computational thinking?

Computational thinking is about looking at a problem in a way that a computer can help us to solve it. This is a two-step process:

1. First, we think about the steps needed to solve a problem.
2. Then, we use our technical skills to get the computer working on the problem.

For example, if you're going to make an animation, you need to start by planning the story and how you'll shoot it before you can use computer hardware and software to help you get the work done. The thinking that is undertaken before starting work on a computer is known as computational thinking.



Barefoot would like to acknowledge the work of Julia Briggs and the eLIM team at Somerset County Council for their contribution to this poster.

Some of the resources link to Barefoot Computing. You will need to create a free account to be able to access these.

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Area	Key Stage 1 Aims	Key Stage 2 Aims
Computer Science (CS)	<ol style="list-style-type: none"> 1. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions 2. Create and debug simple programs 3. Use logical reasoning to predict the behaviour of simple programs 	<ol style="list-style-type: none"> 4. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 5. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output 6. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 7. Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web 8. Appreciate how [search] results are selected and ranked
Information Technology (IT)	<ol style="list-style-type: none"> 1. Use technology purposefully to create, organise, store, manipulate and retrieve digital content 	<ol style="list-style-type: none"> 2. Use search technologies effectively 3. 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
Digital Literacy (DL)	<ol style="list-style-type: none"> 1. Recognise common uses of information technology beyond school 2. 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 	<ol style="list-style-type: none"> 3. Understand the opportunities [networks] offer for communication and collaboration 4. Be discerning in evaluating digital content 5. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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Early Years Foundation Stage			
	Autumn Term	Spring Term	Summer Term
EYFS	<p>How to use IT (ongoing across the year)</p> <ul style="list-style-type: none"> • How to use a keyboard and mouse. • Use a shortcut such as an icon on the desktop to navigate to a specific website • Begin to sort, classify or group various objects progressing from practical activities to the use of ICT, e.g., practically sorting fruit into colours, types or shapes, and then on-screen • Use ICT to sort and sequence objects on a screen or IWB. <p>Digital Literacy</p> <ul style="list-style-type: none"> ▪ Online, interactive stories and rhymes ▪ Screens, IWBs or tablets with mark making software and apps. ▪ Equipment or apps for recording voice ▪ Interact and explore their environment using digital cameras or tablets to record still and moving images ▪ Programs / apps such as Sock Puppets, Puppet Pals and Drawing Pad on tablets or a selection of age appropriate software such as that produced by 2Simple 	<p>Programming – Beebots/Code-a-pillar</p> <ul style="list-style-type: none"> • Use directional language • Independently program a Beebot/Code-a-pillar • Explore simple simulations and find out what happens if • Use control toys in conjunction with stories, (e.g. dress Bee-bot up as a character such as Incy Wincy Spider, and see how many moves it will take to move up the waterspout). • Talk about electronic equipment in real-life situations, (e.g. traffic lights, automatic doors) and investigate how they work. • On screen simulations such as Beebot, Trucks from Duck Duck Moose or Toca Boca (digital toys and games for kids) and simple problem solving games such as Jumbo the Elephant. 	<p>Algorithms - a specific set of instructions.</p> <p>Activities:</p> <ul style="list-style-type: none"> • ‘programming’ friends by telling them how to move around like a robot or make a pretend sandwich • Ordering parts of a story (e.g. The Hungry Caterpillar) <p>Understanding Technology</p> <ul style="list-style-type: none"> ▪ Role play toys (e.g. hoovers, microwaves, tills, old mobile phones, washing machines etc.) ▪ ‘Real’ technology in their home and school (e.g. photocopiers, automatic doors, mobile technology – tablets and phones, hand dryer) ▪ Primary and secondary sources of information about technology in different cultures and in the past (e.g. BBC Bitesize: How Computers have changed, or What are the parts of a computer?)
	<p>How to keep safe on the computer (ongoing through Online Safety curriculum/PSHE) Make children aware of some of the risks to using the internet. Teach the children about personal information and why we must keep it safe</p> <ul style="list-style-type: none"> • age appropriate resources such as Hector’s World • stories such as Digiduck (a story of friendship and responsibility online) and Smartie the Penguin • using child friendly search engines such as Kidrex 		

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Key Stage 1			
	Autumn Term	Spring Term	Summer Term
Year 1	<p>How to Use IT.</p> <p>Computer Skills (Twinkl) Be able to:</p> <ul style="list-style-type: none"> switch on and shutdown a computer use a mouse/trackpad log on, launch an application and save a file <p>Further information and resources</p> <p>Word Processing (Twinkl) Be able to:</p> <ul style="list-style-type: none"> type on and use a keyboard type symbols, edit and format text Pictures - digital camera <p>Twinkl – Painting Purple Mash – Unit 1.6 Animated Story Books (2CreateAStory)</p>	<p>How computers are used around school - go on a computer hunt around school and look at the different uses of computers. Walk around the local community and find examples of where technology is used.</p> <p>Purple Mash Unit 1.9 - Technology outside school Digital Literacy Resources</p>	<p>Algorithms (a list of instructions to complete an activity) and Programming (Beebots). Debugging (correcting an algorithm, i.e. correcting the path of a Beebot to get from A to B)</p> <p>Purple Mash – Coding Unit 1.7 Twinkl – Programming Toys Crazy Character Algorithms Activity Spelling Rules Activity (Algorithms/Phonics) An introduction to Bee-Bots Bee-Bots Tinkering Bee-Bots Basic Activity</p>
		<p>How to use IT (ongoing practise and development of skills.) How to keep safe on the computer. (Ongoing through Online Safety curriculum/PSHE.)</p>	<p>How to use IT (ongoing practise and development of skills) How to keep safe on the computer. (Ongoing through Online Safety curriculum/PSHE.)</p>
Year 2	<p>How to Use IT (ongoing practise and development of skills.) Be able to:</p> <ul style="list-style-type: none"> organise ideas for a presentation create a simple presentation with text add and format an image reorder slides and present a presentation <p>Twinkl - Presentation Skills Purple Mash – Unit 2.8 Presenting Ideas</p> <p>How to use the Internet (Online Safety) Be able to:</p> <ul style="list-style-type: none"> Search the internet using one word and find results suitable for children Stay safe when using the internet and search for information safely <p>Twinkl unit – Using the Internet Purple Mash – Unit 2.5 Effective Searching</p>	<p>Computer Painting</p> <p>Be able to:</p> <ul style="list-style-type: none"> use a range of tools and skills in a computer program to reproduce a style of art <p>Twinkl - Computer Art Purple Mash – Unit 2.6 Creating Pictures (2PaintAPicture)</p>	<p>Algorithms (a list of instructions to complete an activity) and Programming (Purple Mash – 2 Code/Scratch Jnr). Debugging (correcting an algorithm, i.e. correcting the path of a Beebot to get from A to B)</p> <p>Purple Mash – Unit 2.1 Coding Twinkl - Programming Turtle Logo and Scratch</p> <p>Sharing Sweets Activity (Algorithms/Maths) Scratch Jnr Tinkering Scratch Jnr Knock Knock World Map Logic</p>
		<p>How to use IT (ongoing practise and development of skills.) How to keep safe on the computer. (Ongoing through Online Safety curriculum/PSHE.)</p>	<p>How to use IT (ongoing practise and development of skills.) How to keep safe on the computer. (Ongoing through Online Safety curriculum/PSHE.)</p>

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Lower Key Stage 2			
	Autumn Term	Spring Term	Summer Term
Year 3	<p style="text-align: center;">How to use IT</p> <p>(ongoing practise and development of skills across the year) Develop use of Power Point and introduce Publisher.</p> <p>Be able to:</p> <ul style="list-style-type: none"> • Change the case of text/align text • Use bullets and numbering • use the <ctrl> key. • Insert and format text boxes <p>Purple Mash – Unit 3.4 Typing Twinkl - Word Processing unit</p> <p>Twinkl – Presentation skills unit (Powerpoint) (Add theme, transitions and animations to a presentation/insert audio)</p>	<p style="text-align: center;">Programming – Purple Mash/Scratch.</p> <ul style="list-style-type: none"> • Breaking programs into step by step instructions. <p>Reusing Recipes Introduction to Abstraction</p> <ul style="list-style-type: none"> • Be able to use logic to explain why it does or doesn't work. • Understand how changing variables affect the outcomes. <p>Shapes and Crystal Flowers Repetition Activity Drawing 2D Shapes</p> <ul style="list-style-type: none"> • Debugging a simple sequence to make it work. <p>Decomposition Unplugged Activity Dinosaur Fossil Animation</p> <p>Purple Mash – Unit 3.1 Coding Hour of Code</p>	<p style="text-align: center;">Internet Research</p> <p>Be able to:</p> <ul style="list-style-type: none"> • retrieve information efficiently. • explain how searches return results. • Identify how word order affects search results. • stay safe when communicating online • act responsibly online • email safely and collaborate and share on shared sites <p>Twinkl - Internet Research and Communication Selecting Search Results Activity Ranking Search Results Activity</p>
	<p>How to use IT (ongoing practise and development of skills) Safe use of technologies (ongoing development and reinforcement through Online Safety curriculum/PSHE)</p>		

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Lower Key Stage 2			
	Autumn Term	Spring Term	Summer Term
Year 4	<p style="text-align: center;">How to use IT (ongoing practise and development of skills.)Develop use of Power Point and Publisher</p> <p>Be able to:</p> <ul style="list-style-type: none"> • format images for a purpose • use formatting skills to create an effective layout • use the Spellcheck tool • insert and format a table <p>create hyperlinks in a word document</p> <p>Twinkl – Word Processing Unit</p>	<p style="text-align: center;">Programming – Scratch</p> <p>Logical Reasoning - Number Algorithms</p> <p>Be able to:</p> <ul style="list-style-type: none"> • create sequences and make selections. • create games. <p>Make a Game Project</p> <ul style="list-style-type: none"> • debug (the process of identifying and removing errors from instructions or programs.) and improve. <p>Bug in the Water Cycle</p> <ul style="list-style-type: none"> • understand the effect of inputs (adding data into a program or computer system) and outputs/variables. <p>Investigating Inputs Scratch Activity Classroom Sound Monitor Activity (link to Science noise and light monitors)</p> <p>Purple Mash – Unit 4.1 Coding Twinkl – Scratch Questions and Quizzes</p>	<p style="text-align: center;">Search Technologies</p> <p>Be able to:</p> <ul style="list-style-type: none"> • search effectively to find out information. • assess whether an information source is true and reliable. <p>Purple Mash – Unit 4.7 Effective Searching</p> <p style="text-align: center;">Animation</p> <p>Be able to:</p> <ul style="list-style-type: none"> • learn how animations are created by hand. • learn about onion skinning in animation • add background and sounds to animations • be introduced to stop frame animation <p>Purple Mash – Unit 4.6 Animation Twinkl – Animation unit</p>
	<p>How to use IT (ongoing practise and development of skills) Safe use of technologies (ongoing development and reinforcement through Online Safety curriculum/PSHE)</p>		

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Upper Key Stage 2			
	Autumn Term	Spring Term	Summer Term
Year 5	<p style="text-align: center;">Information Technology</p> <p>Spreadsheets (numerical and data applications e.g. Excel)</p> <p>Be able to:</p> <ul style="list-style-type: none"> enter data and formulae into a spreadsheet use a spreadsheet to solve problems plan and calculate a spending budget design a spreadsheet for a specific purpose <p>Purple Mash –Unit 5.3 Spreadsheets Twinkl – Spreadsheets unit (Y6)</p>	<p style="text-align: center;">Internet Research / Podcasting</p> <p>Twinkl unit -Internet Research and Webpage Design</p> <p>Be able to:</p> <ul style="list-style-type: none"> evaluate webpages Create a webpage layout Add text, images and hyperlinks to a webpage Publish and share a webpage <p>Or</p> <p>Twinkl - Radio Station unit (podcasts)</p> <p>Children use Audacity software as an introduction to sound recording.</p> <p>Be able to:</p> <ul style="list-style-type: none"> use software to create my own sounds by recording, editing and playing research and plan digital content for a radio podcast design and record a persuasive radio advert for a product or service. 	<p style="text-align: center;">Programming – use of Scratch/2 Code</p> <p>Be able</p> <ul style="list-style-type: none"> to sequence, make selections and use repetition. Maths Quiz Selection Activity Know the effect of variables. Maths Quiz Variables Activity Be able to develop logical reasons (applying rules in a systematic way to complete a task) to detect and correct errors (bugs). Into to Logical Reasoning Unplugged Sudoku Animated Poem Decomposition Activity Viking Raid Animation Sequence Activity <p>Twinkl - Scratch: Developing Games</p> <ul style="list-style-type: none"> design and program a game with an original character and backdrop I can add features or effects to enhance a game. I can add point-scoring and levels to game code. <p>Purple Mash – Unit 5.1 Coding Hour of Code</p>
	<p>How to use IT (ongoing practise and development of skills)</p> <p>Safe use of technologies (ongoing development and reinforcement through Online Safety curriculum/PSHE)</p>		

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Upper Key Stage 2			
	Autumn Term	Spring Term	Summer Term
Year 6	<p style="text-align: center;">Information Technology</p> <p>Be able to:</p> <ul style="list-style-type: none"> • use appropriate software and other tools effectively to write a film script. • locate and check appropriate digital content, and provide accurate crediting of sources. • use digital recording devices to film and import into video editing software • plan, conduct and import video interviews as part of a short film • use video editing software to create a short film. <p>Twinkl – Film-Making unit</p>	<p style="text-align: center;">Digital Literacy/Information Technology</p> <p style="text-align: center;">Networks/Internet</p> <p>Be able to:</p> <ul style="list-style-type: none"> • understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web • Understand the opportunities [networks] offer for communication and collaboration <p>Modelling the Internet Activity Purple Mash – Unit 6.6 Networks</p>	<p style="text-align: center;">Programming – use of Scratch/Kodu</p> <p>Be able to:</p> <ul style="list-style-type: none"> • sequence, make selections and use repetition. • Know the effect of variables. • develop logical reasons (applying rules in a systematic way to complete a task) to detect and correct errors (bugs). • understand the effect of inputs (adding data into a program or computer system) and outputs/variables. <p>Twinkl – Scratch Animated Stories</p> <ul style="list-style-type: none"> • create appropriate animations for a story scene. • structure and control the timing of events • control when objects need to be visible. • sequence events to create a story narrative. • add voice sounds to enhance an animated story. • add interactive user features to a scene or story. <p>Purple Mash – Unit 6.1 Coding</p>
	<p>How to use IT (ongoing practise and development of skills.)</p> <p>Safe use of technologies – (ongoing development and reinforcement through Online Safety curriculum/PSHE)</p>		