



## Computing

***“Whether you want to uncover the secrets of the universe, or you want to pursue a career in the 21st Century, basic computer programming is an essential skill to learn.” Dr Stephen Hawking***

With technology playing such a significant role in society today, we at Caton believe that ‘Computational thinking’ is a skill children must be taught if they are to be able to participate effectively and safely in this digital world. A high-quality computing education equips pupils to use creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. At Caton, we introduce our pupils to a wide range of technology, including laptops, iPads and interactive whiteboards, allowing them to continually practice and improve the skills they learn. This ensures they become digitally literate so that they are able to express themselves and develop their ideas through information and computer technology– at a level suitable for the future workplace and as active participants in a digital world. We are mindful of the importance of ‘digital literacy’ and teach our children how to be safe, literate users of computing technology.

### **Purpose and aims of computing (NC programmes of study)**

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. 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.

The national curriculum for physical education 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

Reception / KS1

KNOWLEDGE (Year 1 and Year 2)

	Autumn	Spring	Summer
Cycle A	<p><b>Technology around us</b> (<i>Recognising technology in school and using it responsibly</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• Recognise common uses of information technology beyond school</li> <li>• 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</li> </ul> <p><b>Digital Painting</b> (<i>Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> </ul>	<p><b>Digital writing</b> (<i>Using a computer to create and format text, before comparing to writing non-digitally</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• 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</li> </ul>	<p><b>Grouping data</b> (<i>Exploring object labels, then using them to sort and group objects by properties</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• 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</li> </ul> <p><b>Programming animations</b> (<i>Designing and programming the movement of a character on screen to tell stories</i>)</p> <ul style="list-style-type: none"> <li>• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions</li> <li>• Create and debug simple programs</li> <li>• Use logical reasoning to predict the behaviour of simple programs</li> <li>• Recognise common uses of information technology beyond school</li> </ul>
Cycle B	<p><b>Information technology around us</b> (<i>Identifying IT and how its responsible use improves our world in school and beyond</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• Recognise common uses of information technology beyond school</li> <li>• 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</li> </ul> <p>• <b>Programming quizzes</b> (<i>Designing</i>)</p>	<p><b>Digital Photography</b> (<i>Capturing and changing digital photographs for different purposes</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• Recognise common uses of information technology beyond school</li> <li>• 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</li> </ul> <p><b>Pictograms</b> (<i>Collecting data in tally charts</i>)</p>	<p><b>Making music</b> (<i>Using a computer as a tool to explore rhythms and melodies, before creating a musical composition</i>)</p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> </ul> <p><b>Robot algorithms</b> (<i>Creating and debugging programs, and using logical reasoning to make predictions</i>)</p> <ul style="list-style-type: none"> <li>• Understand what algorithms are, how they are implemented as programs on</li> </ul>

	<p><i>algorithms and programs that use events to trigger sequences of code to make an interactive quiz)</i></p> <ul style="list-style-type: none"> <li>• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions</li> <li>• Create and debug simple programs</li> <li>• Use logical reasoning to predict the behaviour of simple programs</li> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> </ul>	<p><i>and using attributes to organise and present data on a computer)</i></p> <ul style="list-style-type: none"> <li>• Use technology purposefully to create, organise, store, manipulate, and retrieve digital content</li> <li>• 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</li> </ul>	<p>digital devices, and that programs execute by following precise and unambiguous instructions</p> <ul style="list-style-type: none"> <li>• Create and debug simple programs</li> <li>• Use logical reasoning to predict the behaviour of simple programs</li> <li>• Recognise common uses of information technology beyond school</li> </ul>
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Knowledge, Skills and Understanding breakdown for Computing			
	Algorithms and Programs	Data Retrieving and Organising	Communicating
<b>Year 1</b>	Can they create a simple series of instructions - left and right? Can they record their routes? Do they understand forwards, backwards, up and down? Can they put two instructions together to control a programmable toy? Can they begin to plan and test a Bee-bot journey?	Can they capture images with a camera? Can they print out a photograph from a camera with help? Can they record a sound and play it back? Can they enter information into a template to make a graph? Can they talk about the results shown on a graph?	Do they recognise what an email address looks like? Have they joined in sending a class email? Can they use the @ key and type an email address? Can they word process ideas using a keyboard? Can they use the spacebar, back space, enter, shift and arrow keys? Can they print out a page from the internet?
<b>Year 2</b>	Can they predict the outcomes of a set of instructions? Can they use right angle turns? Can they use the repeat commands? Can they test and amend a set of instructions? Can they write a simple program and test it? Can they predict what the outcome of a simple program will be?	Can they find information on a website? Can they click links in a website? Can they print a web page to use as a resource? Can they experiment with text, pictures and animation to make a simple slide show? Can they use the shape tools to draw?	Can they send and reply to messages sent by a safe email partner (within school)? Can they word process a piece of text? Can they insert/delete a word using the mouse and arrow keys? Can they highlight text to change its format (B, <u>U</u> , I)?
<b>Year 1 Challenging</b>	Can they record pupils' voices as a voice over? Can they use a teacher prepared photo story to create a slideshow of photos?		

<b>Year 2 Challenging</b>	<p>Can they create a presentation in a small group and record the narration?</p> <p>Can they record sounds into software and playback?</p> <p>Can they insert prerecorded sounds into a presentation?</p> <p>Can they capture still and moving images?</p>
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<b>E-safety in Key Stage 1</b>	
<b>Knowledge &amp; understanding</b>	<b>Skills</b>
<p>Can they understand the different methods of communication (e.g. email, online forums etc)?</p> <p>Do they know you should only open email from a known source?</p> <p>Do they know the difference between email and communication systems such as blogs and wikis?</p> <p>Do they know that websites sometimes include pop-ups that take them away from the main site?</p> <p>Do they know that bookmarking is a way to find safe sites again quickly?</p> <p>Can they begin to evaluate websites and know that everything on the internet is not true?</p> <p>Do they know that it is not always possible to copy some text and pictures from the internet?</p> <p>Do they know that personal information should not be shared online?</p> <p>Do they know they must tell a trusted adult immediately if anyone tries to meet them via the internet?</p>	<p>Can they follow the school's safer internet rules?</p> <p>Can they use the search engines agreed by the school?</p> <p>Can they act if they find something inappropriate online or something they are unsure of (including identifying people who can help; minimising screen; online reporting using school system etc)?</p> <p>Can they use the internet for learning and communicating with others, making choices when navigating through sites?</p> <p>Can they send and receive email as a class?</p> <p>Can they recognise advertising on websites and learn to ignore it?</p> <p>Can they use a password to access the secure network?</p>

## Lower Key Stage 2

### KNOWLEDGE (Year 3 and Year 4)

	Autumn	Spring	Summer
Cycle A	<p><b>Connecting computers</b> (<i>Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>• 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</li> </ul>	<p><b>Photo Collages (link to Art)</b> (Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>	<p><b>Micro:bit (link in DT)</b> (<i>Writing algorithms and programs that use a range of events to trigger sequences</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> </ul> <p><b>Branching databases</b> (<i>Building and using branching databases to group objects using yes/no questions</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>
Cycle B	<p><b>The internet</b> (<i>Recognising the internet as a network of networks including the WWW, and why we should evaluate online content</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> </ul>	<p><b>Sequencing sounds</b> (<i>Creating sequences in a block-based programming language to make music</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> </ul> <p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p>	<p><b>Desktop publishing</b> (<i>Creating documents by modifying text, images, and page layouts for a specified purpose</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> </ul> <p><b>Stop-frame animation</b> (<i>Capturing and editing digital still images to produce a stop-frame animation that tells a story. Audio production Capturing and editing audio to produce a podcast, ensuring that copyright</i>)</p>

	<ul style="list-style-type: none"> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul> <p><b>Audio production</b> (<i>Capturing and editing audio to produce a podcast, ensuring that copyright is considered</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>		<p><i>is considered</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>
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<b>Knowledge, Skills and Understanding breakdown for Computing</b>			
	<b>Algorithms and Programs</b>	<b>Data Retrieving and Organising</b>	<b>Communicating</b>
<b>Year 3</b>	Can they experiment with variables to control models? Can they use 90 degree and 45 degree turns? Can they give an on-screen robot directional instructions? Can they draw a square, rectangle and other regular shapes on screen, using commands? Can they write more complex programs?	Can they review images on a camera and delete unwanted images? Have they experienced downloading images from a camera into files on the computer? Can they use photo editing software to crop photos and add effects? Can they manipulate sound when using simple recording story boarding?	Can they use the email address book? Can they open and send an attachment?
<b>Year 4</b>	Can they use repeat instructions to draw regular shapes on screen, using commands? Can they experiment with variables to control models?	Can they capture images using webcams, screen capture, scanning, visualiser and internet? Can they choose images and download into a file?	Do they appreciate the benefits of ICT to send messages and to communicate? Can they use the automatic spell checker to edit spellings?

	<p>Can they make turns specifying the degrees?</p> <p>Can they give an on-screen robot specific directional instructions that takes them from x to y?</p> <p>Can they make accurate predictions about the outcome of a program they have written?</p>	<p>Can they download images from the camera into files on the computer?</p> <p>Can they copy graphics from a range of sources and paste into a desktop publishing program?</p>	
	<b>Using the Internet</b>	<b>Databases</b>	<b>Presentation</b>
<b>Year 3</b>	<p>Can they find relevant information by browsing a menu.</p> <p>Can they search for an image, copy and paste it into a document?</p> <p>Can they use 'Save picture as' to save an image to the computer?</p> <p>Can they copy and paste text into a document?</p> <p>Do they begin to use note making skills to decide what text to copy?</p>	<p>Can they input data into a prepared database?</p> <p>Can they sort and search a database to answer simple questions?</p> <p>Can they use a branching database?</p>	<p>Can they create a presentation that moves from slide to slide and is aimed at a specific audience?</p> <p>Can they combine text, images and sounds and show awareness of audience?</p> <p>Do they know how to manipulate text, underline text, centre text, change font and size and save text to a folder?</p>
<b>Year 4</b>	<p>Can they use a search engine to find a specific website?</p> <p>Can they use note-taking skills to decide which text to copy and paste into a document?</p> <p>Can they use tabbed browsing to open two or more web pages at the same time?</p> <p>Can they open a link to a new window?</p> <p>Can they open a document (PDF) and view it?</p>	<p>Can they input data into a prepared database?</p> <p>Can they sort and search a database to answer simple questions?</p> <p>Do they recognise what a spread sheet is?</p> <p>Can they use the terms 'cells', 'rows' and 'columns'?</p> <p>Can they enter data, highlight it and make bar charts?</p>	<p>Can they create a lengthy presentation that moves from slide to slide and is aimed at a specific audience?</p> <p>Can they insert sound recordings into a multi media presentation?</p> <p>Do they know how to manipulate text, underline text, centre text, change font and size and save text to a folder?</p>
<b>Year 3 Challenging</b>	<p>Can they search by keyword using a child friendly search engine?</p> <p>Can they bookmark a page into your favourites?</p> <p>Can they contribute to a class blog?</p> <p>Can they use repeat command in logo to create a pattern?</p>		
<b>Year 4 Challenging</b>	<p>Can they use photo editing software to crop photographs and add effects?</p> <p>Can they copy and paste the graph/bar chart and use it in a WP document?</p> <p>Can they use animation in their presentation?</p>		



### E-safety in Years 3 and 4

#### Knowledge & understanding

Do they understand the need for rules to keep them safe when exchanging learning and ideas online?  
Can they recognise that information on the internet may not be accurate or reliable and may be used for bias, manipulation or persuasion?  
Do they understand that the internet contains fact, fiction and opinion and begin to distinguish between them?  
Can they use strategies to verify information, e.g. cross-checking?  
Do they understand the need for caution when using an internet search for images and what to do if they find an unsuitable image?  
Do they understand that copyright exists on most digital images, video and recorded music?  
Do they understand the need to keep personal information and passwords private?  
Do they understand that if they make personal information available online it may be seen and used by others?  
Do they know how to respond if asked for personal information or feel unsafe about content of a message?  
Can they recognise that cyber bullying is unacceptable and will be sanctioned in line with the school's policy?  
Do they know how to report an incident of cyber bullying?  
Do they know the difference between online communication tools used in school and those used at home?  
Do they understand the need to develop an alias for some public online use?  
Do they understand that the outcome of internet searches at home may be different than at school?

#### Skills

Do they follow the school's safer internet rules?  
Do they recognise the difference between the work of others which has been copied (plagiarism) and re-structuring and re-presenting materials in ways which are unique and new?  
Can they begin to identify when emails should not be opened and when an attachment may not be safe?  
Can they explain how to use email safely?  
Can they use different search engines?

## Upper Key Stage 2

### KNOWLEDGE (Year 5 and Year 6)

	Autumn	Spring	Summer
Cycle A	<p><b>Systems and searching</b> (<i>Recognising IT systems around us and how they allow us to search the internet</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>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</li> <li>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul> <p><b>Video production</b> (<i>Planning, capturing, and editing video to produce a short film</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>	<p><b>Selection in physical computing</b> (<i>Exploring conditions and selection using a programmable microcontroller</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> </ul>	<p><b>Variables in games</b> (<i>Exploring variables when designing and coding a game</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> </ul> <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><b>Flat-file databases</b> (<i>Using a database to order data and create charts to answer questions</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> </ul>
Cycle B	<p><b>Communication and collaboration</b> (<i>Identifying and exploring how data is transferred and information is shared online</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Design, write and debug programs that accomplish</li> </ul>	<p><b>Vector drawing</b> (<i>Creating images in a drawing program by using layers and groups of objects</i>)</p> <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, including collecting, analysing, evaluating and presenting data and information</p>	<p><b>Sensing</b> (<i>Designing and coding a project that captures inputs from a physical device</i>)</p> <ul style="list-style-type: none"> <li>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</li> <li>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing</li> </ul>

	<p>specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <ul style="list-style-type: none"> <li>• 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</li> </ul> <p><b>Webpage creation</b> (<i>Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>	<p><b>3D modelling</b> (<i>Planning, developing, and evaluating 3D computer models of physical objects</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>	<p>them into smaller parts</p> <ul style="list-style-type: none"> <li>• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>• Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> </ul> <p><b>Introduction to spreadsheets</b> (<i>Answering questions by using spreadsheets to organise and calculate data</i>)</p> <ul style="list-style-type: none"> <li>• 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</li> </ul>
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<b>Knowledge, Skills and Understanding breakdown for Computing</b>			
	<b>Algorithms and Programs</b>	<b>Data Retrieving and Organising</b>	<b>Communicating</b>
<b>Year 5</b>	<p>Can they combine sequences of instructions and procedures to turn devices on or off? Do they understand input and output? Can they use an ICT program to control an external device that is electrical and/or mechanical? Can they use ICT to measure sound or light or temperature using sensors? Can they explore 'What is' questions by playing adventure or quest games? Can they write programs that have sequences and repetitions?</p>	<p>Can they listen to streaming audio such as online radio? Can they download and listen to podcasts? Can they produce and upload a podcast? Can they manipulate sounds using Audacity? Can they select music from open sources and incorporate it into multimedia presentations? Can they work on simple film editing?</p>	<p>Can they use instant messaging to communicate with class members? Can they conduct a video chat with someone elsewhere in the school or in another school?</p>
<b>Year 6</b>	<p>Can they use a search engine using keyword searches?</p>	<p>Can they create a formula in a spreadsheet and then check for accuracy and plausibility?</p>	<p>Can they use a range of presentation applications?</p>

	<p>Can they compare the results of different searches?</p> <p>Can they decide which sections are appropriate to copy and paste from at least two web pages?</p> <p>Can they save stored information following simple lines of enquiry?</p> <p>Can they download a document and save it to the computer?</p>	<p>Can they search databases for information using symbols such as = &gt; or &lt;?</p> <p>Can they create databases planning the fields, rows and columns?</p> <p>Can they create graphs and tables to be copied and pasted into other documents?</p>	<p>Do they consider audience when editing a simple film?</p> <p>Do they know how to prepare and then present a simple film?</p> <p>Can they use ICT to record sounds and capture both still and video images?</p> <p>Can they make a home page for a website that contains links to other pages?</p> <p>Can they capture sounds, images and video?</p> <p>Can they use the word count tool to check the length of a document?</p> <p>Can they use bullets and numbering tools?</p>
	<b>Using the Internet</b>	<b>Databases</b>	<b>Presentation</b>
<b>Year 5</b>	<p>Can they explain how an algorithm works?</p> <p>Can they detect errors in a program and correct them?</p> <p>Can they use an ICT program to control a number of events for an external device?</p> <p>Can they use ICT to measure sound, light or temperature using sensors and interpret the data?</p> <p>Can they explore 'what if' questions by planning different scenarios for controlled devices?</p> <p>Can they use input from sensors to trigger events?</p> <p>Can they check and refine a series of instructions?</p>	<p>Can they explore the menu options and experiment with images (colour effects, options, snap to grid, grid settings etc.)?</p> <p>Can they add special effects to alter the appearance of a graphic?</p> <p>Can they 'save as' gif or i peg. wherever possible to make the file size smaller (for emailing or downloading)?</p> <p>Can they make an information poster using their graphics skills to good effect?</p>	<p>Can they conduct a video chat with people in another country or organisation?</p>
<b>Year 6</b>	<p>Can they contribute to discussions online?</p> <p>Can they use a search engine using keyword searches?</p> <p>Can they use complex searches using such as '+' 'OR' "Find the phrase in inverted commas"?</p>	<p>Can they collect live data using data logging equipment?</p> <p>Can they identify data error, patterns and sequences?</p> <p>Can they use the formulae bar to explore mathematical scenarios?</p>	<p>Can they present a film for a specific audience and then adapt same film for a different audience?</p> <p>Can they create a sophisticated multimedia presentation?</p>

		Can they create their own database and present information from it?	Can they confidently choose the correct page set up option when creating a document? Can they confidently use text formatting tools, including heading and body text? Can they use the 'hanging indent' tool to help format work where appropriate (e.g. a play script)?
<b>Year 5 Challenging</b>	Can they make a multimedia presentation that contains: sound; animation; video and buttons to navigate? Can they save an image document as a gif or jpeg. file format using the 'save as' command? Can they make an information poster using graphics skills to good effect?		
<b>Year 6 Challenging</b>	Can they incorporate graphics where appropriate, using the most effective text wrapping formats? Can they conduct a video chat with more than one person at a time? Can they compare the information provided on two tabbed websites looking for bias and perspective?		

### E-safety in Years 5 and 6

Knowledge & understanding	Skills
<p>Can they discuss the positive and negative impact of the use of ICT in their own lives and those of their peers and family?</p> <p>Do they understand the potential risk of providing personal information online?</p> <p>Do they recognise why people may publish content that is not accurate and understand the need to be critical evaluators of content?</p> <p>Do they understand that some websites and/or pop-ups have commercial interests that may affect the way the information is presented?</p> <p>Do they recognise the potential risks of using internet communication tools and understand how to minimise those risks (including scams and phishing)?</p> <p>Do they understand that some material on the internet is copyrighted and may not be copied or downloaded?</p> <p>Do they understand that some messages may be malicious and know how to deal with this?</p> <p>Do they understand that online environments have security settings, which can be altered, to protect the user?</p> <p>Do they understand the benefits of developing a 'nickname' for online use?</p> <p>Do they understand that some malicious adults may use various techniques to make contact and elicit personal information?</p> <p>Do they know that it is unsafe to arrange to meet unknown people online?</p> <p>Do they know how to report any suspicions?</p>	<p>Do they follow the school's safer internet rules?</p> <p>Can they make safe choices about use of technology?</p> <p>Do they use technology in ways which minimises risk, e.g. responsible use of online discussions, etc?</p> <p>Can they create strong passwords and manage them so that they remain strong?</p> <p>Can they independently, and with regard for e-safety, select and use appropriate communication tools to solve problems by collaborating and communicating with others within and beyond school?</p> <p>Can they competently use the internet as a search tool?</p> <p>Can they reference information sources?</p> <p>Can they use appropriate strategies for finding, critically evaluating, validating and verifying information, e.g. using different keywords, skim reading to check relevance of information, cross checking with different websites or other non ICT resources?</p> <p>Can they use knowledge of the meaning of different domain names and common website extensions (e.g. .co.uk; .com; .ac; .sch; .org; .gov; .net) to support validation of information?</p>

Do they understand they should not publish other people's pictures or tag them on the internet without permission?

Do they know that content put online is extremely difficult to remove?

Do they know what to do if they discover something malicious or inappropriate?