

## What will my child learn in computing at Balliol?

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 experiences 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 and creative users of information and communication technology

These are the statements from the National Curriculum that teachers use to plan computing lessons for your children =

Computing Curriculum - Pupils should be taught to:		
EYFS (Pre-school, Nursery and Reception)	KS1 (Year one and two)	KS2 (Year two, three, four, five and six)
Despite computing not being explicitly mentioned within the Early Years Foundation Stage (EYFS) statutory framework, which focuses on the learning and development of children from birth to age five, there are many opportunities for your young children to use technology to solve problems and produce creative outcomes. Details of these can be found below.	<u>Computer science:</u> <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 and reasoning to predict the behaviour of simple programs</li> </ul>	<u>Computer science:</u> <ul style="list-style-type: none"> <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> <li>• Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web</li> <li>• Appreciate how (search) results are selected and ranked</li> </ul>
	<u>Information Technology:</u> <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> </ul>	<u>Information Technology:</u> <ul style="list-style-type: none"> <li>• Use search technologies effectively</li> <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>
	<u>Digital Literacy and E-safety:</u> <ul style="list-style-type: none"> <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>	<u>Digital Literacy and E-safety:</u> <ul style="list-style-type: none"> <li>• Understand the opportunities (networks) offer for communication and collaboration</li> <li>• 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>

These are the statements that teachers use to assess Computing =

	E-safety	Computer Science	Digital Literacy	Information Technology
Y1	<ul style="list-style-type: none"> <li>Develop an understanding of how to use technology safely</li> <li>Know where to go for help/support when they have concerns about content/contact on internet</li> </ul>	<ul style="list-style-type: none"> <li>Begin to develop an understanding of algorithms</li> <li>Begin to understand that programs work by following instructions</li> <li>Create simple programs and begin to debug them</li> <li>Develop reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>Use technology to create, store and retrieve digital content</li> </ul>	<ul style="list-style-type: none"> <li>Begin to recognise common uses of information technology beyond school</li> </ul>
Y2	<ul style="list-style-type: none"> <li>Use technology safely and respectfully, keeping personal information private</li> <li>Identify where to go for help/support when concerned about content/contact on internet/other online technologies</li> </ul>	<ul style="list-style-type: none"> <li>Understand what algorithms are</li> <li>Understand how algorithms are implemented as programs on digital devices</li> <li>Understand that programs execute by following precise and unambiguous instructions</li> <li>Use logical reasoning to predict the behaviour of simple programs</li> <li>Create and debug simple programs</li> </ul>	Use technology purposefully to create, store, retrieve, organise and manipulate digital content	<ul style="list-style-type: none"> <li>Recognise common uses of information technology beyond school</li> </ul>
Y3	<ul style="list-style-type: none"> <li>Use technology safely, respectfully and responsibly</li> <li>Recognise acceptable/unacceptable behaviour and identify ways to report concerns about content and contact</li> </ul>	<ul style="list-style-type: none"> <li>Start to use reasoning to understand how algorithms work</li> <li>Detect errors in algorithms and programs</li> <li>Begin to solve problems by decomposing them into smaller parts</li> <li>Start to use sequence and selection in programs</li> <li>Begin to develop understanding of how to write and debug programs that accomplish specific goals, including controlling or simulating physical systems</li> <li>Begin to work with various forms of input/output</li> </ul>	<ul style="list-style-type: none"> <li>Use a variety of software on digital devices</li> </ul>	<ul style="list-style-type: none"> <li>Show emerging understanding of computer networks including the internet and how they provide multiple services such as the World Wide Web</li> <li>Use some search technologies effectively and appreciate how results are selected</li> <li>Decide which questions to ask when using search engines</li> </ul>
Y4	<ul style="list-style-type: none"> <li>Recognise acceptable/unacceptable behaviour and identify ways to report concerns about content and contact</li> </ul>	<ul style="list-style-type: none"> <li>Use logical reasoning to understand how algorithms work</li> <li>Detect &amp; correct errors in algorithms and programs</li> <li>Start to use sequence, selection and repetition in programs</li> <li>Write and debug programs that accomplish specific goals, including controlling or simulating physical systems</li> <li>Begin to solve problems by decomposing them into smaller parts</li> <li>Work with variables and various forms of input/output</li> </ul>	<ul style="list-style-type: none"> <li>Select and use a variety of software on digital devices</li> </ul>	<ul style="list-style-type: none"> <li>Understand computer networks including the internet and how they provide multiple services such as the World Wide Web</li> <li>Use search technologies effectively and appreciate how results are selected and ranked</li> <li>Evaluate the reliability of digital content</li> <li>Begin to ask and answer questions based on the reliability of digital content</li> </ul>

	E-safety	Computer Science	Digital Literacy	Information Technology
Y5	<ul style="list-style-type: none"> <li>Confidently, competently and responsibly use information and communication technology</li> </ul>	<ul style="list-style-type: none"> <li>Write and debug programs that accomplish specific goals, including controlling or simulating physical systems</li> <li>Solve problems by decomposing them into smaller parts</li> <li>Use sequence, selection and repetition in programs</li> <li>Accurately manipulate variables and various forms of input/output</li> <li>Use logical reasoning to understand how algorithms work and detect and correct errors in algorithms and programs</li> </ul>	<ul style="list-style-type: none"> <li>Express own ideas by selecting, using and combining a variety of software on digital devices to design and create programs</li> </ul>	<ul style="list-style-type: none"> <li>Recognise the opportunities computer networks offer for communication and collaboration</li> <li>Use a wide range of search technologies effectively and appreciate how results are selected and ranked</li> <li>Be discerning in evaluating the reliability of digital content</li> </ul>
Y6	<ul style="list-style-type: none"> <li>Confidently, competently and responsibly use information and communication technology</li> </ul>	<ul style="list-style-type: none"> <li>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems</li> <li>Solve problems by decomposing them into smaller parts</li> <li>Use sequence, selection and repetition accurately in programs</li> <li>Accurately manipulate a wide range of variables and various forms of input/output</li> <li>Securely use logical reasoning to understand how algorithms work and detect and correct errors in algorithms and programs</li> </ul>	<ul style="list-style-type: none"> <li>Express own ideas by selecting, using and combining a variety of software on a range of digital devices and create programs</li> </ul>	<ul style="list-style-type: none"> <li>Use the opportunities computer networks offer for communication and collaboration</li> <li>Appreciate how results are selected and ranked and use this to retrieve accurate content</li> <li>Be discerning in evaluating the reliability of digital content</li> </ul>

This is what your child will be covering in computing over the school year to ensure that all of the above statements are covered in full

Preschool Computing =

Continuous Provision

IPad- use of finger to paint on screen- choose colours, explore and mark-make

Role play- laptops/desktops in office area

Pushdown toys

Nursery Computing - continuous provision- toys in role play area, tills, play cameras, play telephones =

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
<b>Topic/Focus</b>	<b>Autumn 1 Me and My Community</b>  (Exploring Autumn)	<b>Once Upon a Time</b>  (Sparkle & Shine)	<b>Spring 1 Starry Night</b>  (Winter Wonderland)	<b>Spring 2 Dangerous Dinosaurs</b>  (Puddles and Rainbows)	<b>Summer 1 Sunshine and Sunflowers</b>  (Shadows and Reflections)	<b>Summer 2 Big Wide World</b>  (Splash!)
<b>Story/Song</b>	Five Minutes Peace Rainbow Fish  <u>Topic Books</u> Pumpkin Soup The Leaf Man The Leaf Thief	The Three Little Pigs Goldilocks and the Three Bears The Gingerbread Man  <u>Topic Books</u> The Nativity Sparks in the Sky	Whatever Next! Peace at Last Owl Babies The Gruffalo's Child  <u>Topic Books</u> The Snow Thief The Bear Snores On The Big Freeze	Stop the Dinosaur Dinosaurs Live Underpants Cave Baby  <u>Topic Books</u> Pudding! The Colour Monster Shark in the Park on a Windy day	All Are Welcome Our World: A First Book of Geography Fatou, Fetch the Water Handa's Surprise  <u>Topic Books</u> The Duck who didn't like Water Commotion in the Ocean Penguin on Holiday	My Butterfly Bouquet The Tiny Seed I can Grow a Sunflower Summer is Here!  <u>Topic Books</u> Guess How Much I Love You in the Summer The Crunching Munching Caterpillar
<b>Computing</b>	<b>Watch/Listen Audio Books</b> Listen/watch to stories on the computer/audio.  Using programme Paint/Lynx to create self-portrait.  <b>IPads - Photos</b> Taking Photos/Videos and talking about what they and others look like. Similarities/differences.  Children learn to: -Point and click -Record -Review -Talk about what they captured	<b>Cause &amp; Effect</b>  Unplugged/screen free activities to promote cause and effect. Knowing that with an input, there will be an output. Explore this with arrow cards, lists, ordering etc.  -Put picture cards in order (e.g., brushing teeth, getting dressed) -Make sandwich following child-given instructions  Explore toys with buttons, learning that when something is pressed, then something should happen.	<b>Sequencing &amp; Instructions</b> Helps children learn step-by-step thinking.  -“Robot game” — children give you step-by-step commands (e.g., “forward, forward, turn”)  <b>Beebots</b> Children program simple movements → introduces coding concepts.	<b>IPads - Photos</b> Taking Photos/Videos with a focus on signs of Spring.  Children learn to: -Point and click -Record -Review -Talk about what they captured	<b>Painting</b> Using IWB to mark make creating different pictures, letter shapes etc..  Discussions about e-safety and staying on the programme that has been loaded up and not clicking on other icons.	<b>Sequencing</b> Sequence story pictures/life cycles by clicking and dragging on the IWB.
<b>Websites:</b>		<a href="https://www.barefootcomputing.org/early-years-with-all-resources">https://www.barefootcomputing.org/early-years-with-all-resources</a>	Online beebot where you can change the mat to different themes = <a href="https://beebot.terrapiinlogo.com/">https://beebot.terrapiinlogo.com/</a>		<a href="https://www.ecosystemforkids.com/life-cycles/life-cycle-of-a-butterfly.html">https://www.ecosystemforkids.com/life-cycles/life-cycle-of-a-butterfly.html</a>  <a href="https://tuxpaint.org/">https://tuxpaint.org/</a>	
<b>Free-Flow Activities:</b>	-Take photos of shapes outdoors -Photo missions: “Find something round/smooth/blue”	-Cause and Effect Light Up/Musical Toys	-Bee-Bot obstacle course -Robot instructions game -Tech discovery tray -Button toys & remote controls -Pattern & sequencing table -Build a pattern bracelet			
<b>On-Going Role-Play Areas – Across the Year:</b> Home – Microwave, Telephones, Oven, Television Controls			<b>Free-Flow Activities:</b>	<b>Websites</b> Internet based ones:		

<p>Doctors Surgery – Telephones, Laptops, Keyboards Robot Role-Play - Fixing</p> <p><b>Activity:</b> “What does this button do?” exploration table Children learn: Buttons Icons Inputs/outputs Cause &amp; effect</p>	<ul style="list-style-type: none"> <li>- Tool play: old keyboards, phones, calculators</li> <li>- Sorting objects station</li> <li>-</li> </ul>	<p>Topmarks English = <a href="https://www.topmarks.co.uk/english-games/3-5-years/letters-and-sounds">https://www.topmarks.co.uk/english-games/3-5-years/letters-and-sounds</a>  Topmarks maths = <a href="https://www.topmarks.co.uk/maths-games/3-5-years/counting">https://www.topmarks.co.uk/maths-games/3-5-years/counting</a>  ABCYA (various games) = <a href="https://www.abcya.com/">https://www.abcya.com/</a>  Magnetic letters = <a href="https://bigbrownbear.co.uk/letters.com/">https://bigbrownbear.co.uk/letters.com/</a>  Interactive games on twinkl = <a href="https://www.twinkl.co.uk/resources/twinkl-go/eyfs-twinkl-go">https://www.twinkl.co.uk/resources/twinkl-go/eyfs-twinkl-go</a>  Cbeebies games = <a href="https://www.bbc.co.uk/cbeebies/games">https://www.bbc.co.uk/cbeebies/games</a>  Whiterose digital tools = <a href="https://whiteroseeducation.com/resources/digital-tools">https://whiteroseeducation.com/resources/digital-tools</a>  Polypad virtual maths tools = <a href="https://polypad.amplify.com/">https://polypad.amplify.com/</a>  Maths manipulatives = <a href="https://mathsbot.com/manipulativeMenu">https://mathsbot.com/manipulativeMenu</a>  Toy theatre virtual tools = <a href="https://toytheater.com/category/teacher-tools/virtual-manipulatives/">https://toytheater.com/category/teacher-tools/virtual-manipulatives/</a>  Phonics games starting at phase 1 = <a href="https://www.phonicsbloom.com/">https://www.phonicsbloom.com/</a>  Early years games = <a href="https://ictgames.com/mobilePage/eyfs.html">https://ictgames.com/mobilePage/eyfs.html</a>  Numberblocks game = <a href="https://www.bbc.co.uk/bitesize/articles/zf3r96f">https://www.bbc.co.uk/bitesize/articles/zf3r96f</a></p>
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Reception Computing =

Autumn 1	IPad drawing, photos and filming
Autumn 2	Drawing pictures on the IWB Digital art Explore the keyboard (paper copy version – build up to laptops later in the year) iPad videos and photos Beebot introduction Remote controlled cars
Spring 1	E-safety
Spring 2	Remote controlled cars IWB picture and then animate your drawing of fruit/veg ( <a href="https://sketch.metademolab.com/canvas">https://sketch.metademolab.com/canvas</a> )
Summer 1	Beebots with maps IWB farm animal drawing Laptop introduction (if time on the last week)
Summer 2	Laptops and Google Earth beaches Mini mobile phones Metal detectors

	Unit	Title	Unit Summary	Computing Programme of study focus	Suggested Software/Hardware
Year One	1.1	We are treasure hunters	Using programmable toys	Programming	Programmable toys/Bee-bots and blue-bot apps
	1.2	We are TV chefs	Filming the steps of a recipe	Computational thinking	Paint/Fresh Paint/Movie maker/iMovie
	1.3	We are painters	Illustrating an eBook	Creativity	Tux paint/Paint/2 Paint a picture/Fresh paint/IWB software/Word
	1.4	We are collectors	Finding images using the web	Computer networks	Web browser/Power point/IWB software/Explain everything
	1.5	We are storytellers	Producing a talking book	Communication/ Collaboration	PowerPoint/2 create a story/IWB software/Explain everything
	1.6	We are celebrating	Creating a card electronically	Productivity	Powerpoint/Word/Clicker 7/Fresh paint/2 paint a picture
Year Two	2.1	We are astronauts	Programming on a screen	Programming	Scratch/Kodu/Scratch Jnr/Pyonkee
	2.2	We are games testers	Explore how computer games work	Computational thinking	Scratch/Screencast-O-Matic/ Pyonkee
	2.3	We are photographers	Taking, selecting and editing digital images	Creativity	Picasa/Pixir.com/snapseed
	2.4	We are researchers	Researching a topic	Computer networks	FreeMind/web browsers/ PowerPoint
	2.5	We are detectives	Communicating clues	Communications/ Collaboration	Email system/ Excel. Google sheets
	2.6	We are zoologists	Recording bug hunt data	Productivity	Excel/ Google sheets/ Picasa/ Photo gallery/ Snapseed/ Google maps/ Google Earth
Year Three	3.1	We are programmers	Programming an animation	Programming	Scratch/ Scratch Jr/ Pyonkee
	3.2	We are bug fixers	Finding and correcting bugs in programs	Computational thinking	Scratch/ Snap!/ Pyonkee
	3.3	We are presenters	Videoing performances	Creativity	Movie maker/iMovie
	3.4	We are vloggers	Making and sharing a short screencast presentation	Computer networks	Google/ PowerPoint/Quick time player/ Screencast-omatic/ explain everything/ adobe voice
	3.5	We are communicators	Communicating safely on the internet	Communication/ Collaboration	Email system/Skype/ Google hangouts/ Powerpoint/ Google slides
	3.6	We are opinion pollsters	Collecting and analysing data	Productivity	Google forms/j2Data/ Google sheets and google slides/ InspireData/ Excel/ Word
Year Four	4.1	We are software developers	Developing a simple educational game	Programming	Scratch/Snap!/ Pyonkee
	4.2	We are toy designers	Prototyping an interactive toy	Computational thinking	Scratch/Snap!/ Pyonkee
	4.3	We are musicians	Producing digital music	Creativity	Isle of tune/ Audacity/ LMMS/ GarageBand/ MuseScore
	4.4	We are HTML editors	Editing and writing HTML	Computer networks	Firefox/ Chrome/ Brackets
	4.5	We are co-authors	Producing a wiki	Communication/ Collaboration	Learning platform/ MediaWiki/ google sites
	4.6	We are meteorologists	Presenting the weather	Productivity	Excel/ Google sheets/ Powerpoint/ IWB software

Year Five	5.1	We are game developers	Developing an interactive game	Programming	Scratch/ Snap!/ Pyonkee/ kodu
	5.2	We are cryptographers	Cracking codes	Computational thinking	Scratch/ Snap!/ Pyonkee/ the black chamber
	5.3	We are artists	Fusing geometry and art	Creativity	Inkscape/ adobe illustrator/ corelDRAW/ Scratch/ Scribble/ TurtleArt/ Terragen
	5.4	We are web developers	Creating a web page about cyber safety	Computer networks	Google/ Google sites/ learning platform/ word press/ adobe state
	5.5	We are bloggers	Sharing experiences and opinions	Communications/ Collaboration	WordPress/ learning platform/ GIMP/ audacity/ movie maker
	5.6	We are architects	Creating a virtual space	Productivity	Trimble sketchUp/ Screencast-o-matic
Year Six	6.1	We are adventure gamers	Making a text-based adventure game	Programming	Python (using the IDLE editor)/ Trinket.io/ Pythonista
	6.2	We are computational thinkers	Mastering algorithms for searching, sorting and mathematics	Computational thinking	Unplugged resources/Scratch/ Snap!/ Pyonkee
	6.3	We are advertisers	Creating a short television advert	Creativity	MovieMaker/ iMovie
	6.4	We are network engineers	Exploring computer networks including the internet	Computer networks	Command prompt/ Scratch/ open visual traceroute
	6.5	We are travel writers	Using media and mapping to document a trip	Productivity	Google maps/ Google Earth/ Pixlr/ snapseed/ Movie maker/ imovie/ audacity/ garage band/ trackrec
	6.6	We are publishers	Creating a year book	Communication/ collaboration	Publisher/ scribus/ ibook author/ pages/ book creator/ google drive