Computing Curriculum



"Be The Best We Can Be"

National Curriculum Purpose 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 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.

National Curriculum 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.

How do we grow our Brookfield 'Masters of Technology' to be the best they can be?

What is our INTENT for our Brookfield Masters of Technology?

Our curriculum goes beyond a plan of what will be taught and when it will be taught. It covers all the experiences a child receives under our guidance. As educationalists we take our responsibility for the future of our young learners very seriously. Our curriculum will ensure that our children become confident, independent, resilient, curious learners with self-belief and our school ethos fully supports this. Our aim is for every child "To Be The Best They Can Be".

Technology is changing the lives of everyone, never more so than in recent months. At Brookfield Primary School, we aim to equip children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. Through our computing curriculum, we aim to give our pupils the life-skills that will enable them to embrace and utilise new technology in a socially responsible and safe way in order to flourish. We want our pupils to be able to operate in the 21st century workplace and we want them to know the career opportunities that will be open to them if they study computing. We want children to become autonomous, independent users of computing technologies, gaining confidence and enjoyment from their activities. We want the use of technology to support learning across the entire curriculum and to ensure that our curriculum is accessible to every child. Not only do we want them to be digitally literate and competent end-users of technology but through our computing lessons we want them to develop creativity, resilience and

How do we IMPLEMENT this for our Brookfield Masters of Technology?

To ensure high standards of teaching and learning in computing we implement a curriculum that is progressive throughout the whole school. At Brookfield, computing is taught in discreet computing lessons but the use of technology is encouraged to support learning across all curriculum areas. We use The NCCE Computing Curriculum scheme of work to cover the three areas of the Computing National Curriculum: Digital Literacy, Computer Science and Information Technology which follows the twelve pedagogy principles.

Every lesson in our scheme has been individually planned so that it can be effectively taught using the infrastructure we have in place at school and so that it can meet the needs of all our pupils. Our scheme has been closely referenced against the 2014 National Curriculum attainment targets in order to ensure progression and coverage. Having discreet lessons means that the children are able to develop depth in their knowledge and skills over the duration of each of their computing topics. Where appropriate, meaningful links will be made between the computing curriculum at the wider curriculum. In computing lessons, the children will use either IPads or laptops in order to access a range of apps and software.

Online safety is taught regularly at an age appropriate level and forms the basis of all computing learning. Children are also taught about vocabulary linked to computing and key skills for life.

How do we measure success for our Brookfield Masters of Technology?

We encourage our children to enjoy and value the curriculum we deliver. We will constantly ask the WHY behind their learning and not just the HOW. We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and well-being. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils showcase, share, celebrate and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills digitally as well as observing learning regularly. Progress of our computing curriculum is demonstrated through outcomes and the record of coverage in the process of achieving these outcomes.

problem-solving and critical thinking skills. We want our pupils to have a breadth of experience to develop their understanding of themselves as individuals within their community but also as members of a wider global community and as responsible digital citizens.	

Kev st	age content/Expectation	What will progress of sills be in each year group?	What will Age-Related	What will the Greater
7	, , , , , , , , , , , , , , , , , , , ,	,	Standard look like at	Depth Standard at
			Brookfield Primary School?	Brookfield look like?
	Year 1 and 2	Year 1	Year 1	Year 1
		Identify technology Identify a computer and its main parts.	A pupil working at age-related	Any children who
	Children in KS1 will	Use a mouse in different ways. Use a keyboard to type. Use	expectations should be able to	continue to develop
	understand what	the keyboard to edit text. Create rules for using technology	meet the success criteria for	knowledge and skills at a
	algorithms are.	responsibly.	each lesson by the end of the	much deeper level will
		Explain what a given command will do/act out a given word.	unit. However, it should also	be considered to be
	Create simple programs.	Combine forwards and backwards commands to make a	be noted that some pupils	working at Greater
		sequence. Combine four direction commands to make	may take longer to grasp	Depth that is when all
	Understand that algorithms	sequences. Plan a simple program. Find more than one	certain skills and concepts and	the objectives for the
	are implemented as	solution to a problem. Choose a command for a given	therefore may achieve a	units have been met in
	programs on digital	purpose. Show that a series of commands can be joined	success criterion from a lesson at a later date. At the end of a	full.
d)	devices.	together. Identify the effect of changing a value. Explain that each sprite has its own instructions. Design the parts of a	unit, the school will use	
) u		project. Use my algorithm to create a program.	observations that have been	
KS1 Computer Science		project. Ose my algorithm to create a program.	made across each of the	
er.	Understand that programs		lessons to determine an	
but	Understand that programs execute by following		overall snapshot of a pupil's	
l w	precise and unambiguous		understanding of the content	
0	instructions.		from that unit.	
KS	mod detions.			
	Debug simple programs.	Year 2	Year 2	Year 2
		Describe a series of instructions as a sequence. Explain what	A pupil working at age-related	Any children who
	Use logical reasoning to	happens when we change the order of instructions. Use	expectations should be able to	continue to develop
	predict the behaviour of	logical reasoning to predict the outcome of a program (series	meet the success criteria for	knowledge and skills at a
	simple programs.	of commands). Explain that programming projects can have	each lesson by the end of the	much deeper level will
		code and artwork. Design an algorithm. Create and debug a	unit. However, it should also	be considered to be
		program that I have written.	be noted that some pupils	working at Greater
		Explain that a sequence of commands has a start. Explain that	may take longer to grasp	Depth that is when all the objectives for the
		a sequence of commands has an outcome. Create a program using a given design. Change a given design. Create a program	certain skills and concepts and therefore may achieve a	units have been met in
		using my own design. Change a given design. Create a program using my own design. decide how my project can be	success criterion from a lesson	full.
		improved.	at a later date. At the end of a	Tun.
		iiiipi ovea.	at a later date. At the end of a	

			unit, the school will use	
			observations that have been	
			made across each of the	
			lessons to determine an	
			overall snapshot of a pupil's	
			understanding of the content	
			from that unit.	
	Year 3 and 4	Year 3 and 4	Year 3 and 4	Year 3 and 4
	Write programs that	Children build on their programming skills by solving problems	A pupil working at age-related	Any children who
	accomplish specific goals.	and programming commands to achieve a specific outcome.	expectations should be able to	continue to develop
	Use sequence in programs.	They begin to write programs, explain algorithms and identify	meet the success criteria for	knowledge and skills at a
	Work with various forms of	errors in their work.	each lesson by the end of the	much deeper level will
	input.	Children design, write and debug programs that accomplish	unit. However, it should also	be considered to be
	Work with various forms of	specific goals, including controlling or simulating physical	be noted that some pupils	working at Greater
	output.	systems; they solve problems by decomposing them into	may take longer to grasp	Depth that is when all
	Design programs that	smaller parts. They use sequence, selection, and repetition in	certain skills and concepts and	the objectives for the
	accomplish specific goals.	programs and work with variables and various forms of input	therefore may achieve a	units have been met in
) Ce	Design and create	and output. They use logical reasoning to explain how some	success criterion from a lesson	full.
KS 2 Computer Science	programs.	simple algorithms work and to detect and correct errors in	at a later date. At the end of a	
S	Debug programs that	algorithms and programs.	unit, the school will use	
ıte.	accomplish specific goals.	Children can:	observations that have been	
l pt	Use repetition in programs.	a use logical thinking to solve an open-ended problem by	made across each of the	
l Ö	Control or stimulate	breaking it up into smaller parts;	lessons to determine an	
2 (physical systems.	b write a program, putting commands into a sequence to	overall snapshot of a pupil's	
\$	Use logical reasoning to	achieve a specific outcome;	understanding of the content	
	detect and correct errors in	c give a set of instructions to follow and predict what will	from that unit.	
	programs.	happen;		
	Understand how computer	d keep testing a program and recognise when it needs to be		
	networks can provide	debugged;		
	multiple services, such as	e use variables to create an effect, e.g. repetition, if, when,		
	the World Wide Web.	loop;		
	Appreciate how search	f use key vocabulary to demonstrate knowledge and		
	results are selected.	understanding in this strand: decompose, decomposing,		
		logical sequence, flowchart, sprite, block, command,		
		algorithm, answer, correct, errors, program, algorithm,		

instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable.

Children can: a talk about the different ways data can be organised; b sort and organise information to use in other ways; c search a ready-made database to answer questions; d use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table Children refer to online safety rules when discussing technology in their lives. They are able to navigate between websites and use safe search terms on trusted search engines. They become more confident in using email for communication, including attaching and saving files from emails.

Children 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. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content. Children can:

- a explain ways to communicate with others online;
- **b** describe the world wide web as the part of the internet that contains websites;
- c add websites to a favourites list;
- **d** use search tools to find and use an appropriate website and content;
- **e** use strategies to improve results when searching online; **f** use key vocabulary to demonstrate knowledge and understanding in this strand: filter, Google, search engine, image, keyboard, email, subject, address, communicate, sender, safe, secure, internet, world wide web, social media.

Year 5 and 6

Solve problems by decomposing them into smaller parts.

Use selection programs. Work with variables.

Use logical reasoning to explain how some simple algorithms work.
Use logical reasoning to

detect and correct errors in algorithms.

Understand computer networks, including the internet.

Appreciate how search results are ranked

Year 5 and 6

Children build on their programming skills by using new systems such as a flowchart. They continue to break down problems and create algorithms to solve them. They are able to explain the outcome of an algorithm with confidence and accuracy. Children design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; they solve problems by decomposing them into smaller parts. They use sequence, selection, and repetition in programs and work with variables and various forms of input and output. They use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Children can:

a use external triggers and infinite loops to demonstrate control;

b follow a sequence of instructions, e.g. in a flowchart and modify a flowchart using symbols;

c use conditional statements and edit variables;

d decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program;

e keep testing a program and recognise when it needs to be debugged;

f use key vocabulary to demonstrate knowledge and understanding in this strand: flowchart, algorithm, control, output, symbol, start, stop, delay, process, decision, loop, backdrop, script, block, repeat, commentary, sequence, consequence, debug, program, Kodu, world, object, tool palette, program environment, smooth, flatten, raise

Children can use safe search terms on trusted search engines, and evaluate websites based on layout and information. They become more confident in understanding Google rankings, adverts and the reliability of websites. Children understand computer networks, including the internet; how they can

Year 5 and 6

A pupil working at age-related expectations should be able to meet the success criteria for each lesson by the end of the unit. However, it should also be noted that some pupils may take longer to grasp certain skills and concepts and therefore may achieve a success criterion from a lesson at a later date. At the end of a unit, the school will use observations that have been made across each of the lessons to determine an overall snapshot of a pupil's understanding of the content from that unit.

Year 5 and 6

Any children who continue to develop knowledge and skills at a much deeper level will be considered to be working at Greater Depth that is when all the objectives for the units have been met in full.

	provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration. They use search technologies effectively, appreciate how results are selected and ranked, and are discerning in evaluating digital content. Children can: a search for information using appropriate websites and advanced search functions within Google; b use strategies to check the reliability of information (crosscheck with another source such as books); c talk about the way search results are selected and ranked; d check the reliability of a website, including the photos on site; e tell you about copyright and acknowledge the sources of information; f use key vocabulary to demonstrate knowledge and understanding in this strand: world wide web, search, search engine, advanced search, results, Google, browser, terms of use, bias, authority, citation, plagiarism, source, website, secure, https, site, domain, website, browser, address bar		
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K	ey stage content/Expectation	What will progress of sills be in each year group?	What will Age-Related	What will the
			Standard look like at	Greater Depth
			Brookfield Primary School?	Standard at
				Brookfield look like?
	Year 1 and 2	Year 1	Year 1	Year 1
_	Year 1 and 2 Use technology	Year 1 Identify technology Identify a computer and its main parts. Use a	Year 1 A pupil working at age-	Year 1 Any children who
S1IT	1 0 0 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 2 2	1	

Use technology purposefully to store digital content. Use technology purposefully to retrieve digital content.
Use technology purposefully to organise digital content.
Use technology purposefully to manipulate digital content.

write. Add and remove text on a computer. Identify that the look of text can be changed on a computer. Make careful choices when changing text. Explain why I used the tools that I chose. Compare writing on a computer with writing on paper. Label objects. Identify that objects can be counted. Describe objects in different ways. Count objects with the same properties. Compare groups of objects. Answer questions about groups of objects.

Describe what different freehand tools do. Use the shape tool and the line tools. Make careful choices when painting a digital picture. Explain why I chose the tools I used. Use a computer on my own to paint a picture. Compare painting a picture on a computer and on paper.

criteria for each lesson by the end of the unit. However, it should also be noted that some pupils may take longer to grasp certain skills and concepts and therefore may achieve a success criterion from a lesson at a later date. At the end of a unit, the school will use observations that have been made across each of the lessons to determine an overall snapshot of a pupil's understanding of the content from that unit.

at a much deeper level will be considered to be working at Greater Depth that is when all the objectives for the units have been met in full.

Year 2

Recognise the uses and features of information technology. Identify information technology in the home. Identify information technology beyond school. Explain how information technology benefits us. Show how to use information technology safely. Recognise that choices are made when using information technology. Recognise that we can count and compare objects using tally charts. Recognise that objects can be represented as pictures. Create a pictogram. Select objects by attribute and make comparisons Recognise that people can be described by attributes. Explain that we can present information using a computer. Recognise that we can count and compare objects using tally charts. Recognise that objects can be represented as pictures. Create a pictogram. Select objects by attribute and make comparisons Recognise that people can be described by attributes. Explain that we can present information using a computer. Know what devices can be used to take photographs. Use a digital device to take a photograph. Describe what makes a good photograph. Decide how photographs can be improved. Use tools to change an image. Recognise that images can be changed.

Year 2

A pupil working at agerelated expectations should be able to meet the success criteria for each lesson by the end of the unit. However, it should also be noted that some pupils may take longer to grasp certain skills and concepts and therefore may achieve a success criterion from a lesson at a later date. At the end of a unit, the school will use observations that have been made across each of the lessons to determine an overall snapshot of a pupil's understanding of the content from that unit.

Year 2

Any children who continue to develop knowledge and skills at a much deeper level will be considered to be working at Greater Depth that is when all the objectives for the units have been met in full.

	e plan an animation and move items within each animation for playback; f use key vocabulary to demonstrate knowledge and understanding in this strand: audio, sound, video, movie, embed, link, file format, animate, animation, still image, thaumatrope, zoetrope, zoopraxiscope, stereoscope, flip book, frame, onion skinning, loop, frame rate, record, stop, play, stop motion, stop frame		
Year 5 and 6 Combine a variety of software to accomplish given goals. Select, use and combine software on a range of digital devices. Analyse data. Evaluate data. Design and create systems.	Year 5 and 6 Children begin to look at new software, creating 3D models and learning how to orbit, zoom and develop their editing skills further. They become more confident in inserting links, images and formatting text to create effect. Children 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. Children can: a use the skills already developed to create content using unfamiliar technology; b select, use and combine the appropriate technology tools to create effect; c review and improve their own work and support others to improve their work; d save, retrieve and evaluate their work, making amendments; e insert a picture/text/graph/hyperlink from the internet or personal file; f use key vocabulary to demonstrate knowledge and understanding in this strand: window, layout, text, font, colour, format, heading, hyperlink, 2D shape, 3D shape, orbit, pan, zoom, eraser, dimension, measurement, guide Children 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,	Year 5 and 6 A pupil working at agerelated expectations should be able to meet the success criteria for each lesson by the end of the unit. However, it should also be noted that some pupils may take longer to grasp certain skills and concepts and therefore may achieve a success criterion from a lesson at a later date. At the end of a unit, the school will use observations that have been made across each of the lessons to determine an overall snapshot of a pupil's understanding of the content from that unit.	Year 5 and 6 Any children who continue to develop knowledge and skills at a much deeper level will be considered to be working at Greater Depth that is when all the objectives for the units have been met in full.
	including collecting, analysing, evaluating and presenting data and information.		

Children can:

a construct data on the most appropriate application; **b** know how to interpret data, including spotting inaccurate data and comparing data; **c** use keyboard shortcuts and functions to input data on spreadsheets and create formulas for spreadsheets; d add data to an existing database; e use key vocabulary to demonstrate knowledge and understanding in this strand: Google Docs, insert, table, spreadsheet, cell, row, column, formula/formulas, calculate, format, edit, insert, ascending, descending Children begin to look more into multimedia broadcasting, learning new skills including recording jingles, podcasts and narration. They become more confident in post-production with editing, trimming and refining their work based on plans they have made. Children 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. Children can: a collect audio from a variety of resources including own recordings and internet clips; **b** use a digital device to record sounds and present audio; **c** trim, arrange and edit audio levels to improve quality; **d** publish their animation and use a movie editing package to edit/refine and add titles: **e** use key vocabulary to demonstrate knowledge and understanding in this strand: audio, record, edit, play stop, skip, waveform, input, output, record, edit, play podcast, digital content, downloadable, backing track, voiceover, mute, gain, production, post-production, documentary, project, evaluation, screening, ceremony, upload.

Key stage content/Expectation		What will progress of sills be in each year group?	What will Age-Related Standard look like at Brookfield Primary School?	What will the Greater Depth Standard at Brookfield look like?
KS 1 Digital Learning	Year 1 and 2 Use technology safely. Keep personal information private. Recognise common uses of information technology beyond school. Use technology respectfully. Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Children can use technology safely and respectfully, keeping personal information private; they identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. Children can: a identify what things count as personal information; b identify what is appropriate and inappropriate behaviour on the internet; c agree and follow sensible online safety rules, e.g. taking pictures, sharing information, storing passwords; d seek help from an adult when they see something that is unexpected or worrying; e demonstrate how to safely open and close applications and log on and log off from websites; f use key vocabulary to demonstrate knowledge and understanding in this strand: safe, meet, accept, reliable, tell, online, trusted, adult, information, safety, personal, key, question, tell, safe, share, stranger, danger, internet	Year 1 and 2 Children working at age related expectations will demonstrate their full understanding of E Safety strands both within their work beyond. They will be able to articulate this to others. Children will also demonstrate this beyond the school/classroom e.g. Use of Apps, Mobile phones used outside of school and on line gaming.	Year 1 and 2 Children who are regularly able to demonstrate total adherence to all E Safety rules and articulate fully and explain the reasoning behind the rues will be considered for Greater Depth.
KS 2 Digital Learning	Year 3 and 4 Use technology responsibly. Identify a range of ways to report concerns about contract, Understand the opportunities computer networks offer for communication. Identify a range of ways to report concerns about content.	Year 3 and 4 Children become more aware of their digital footprint by reflecting on their experience on the internet. They are able to understand more about age-appropriate websites and adverts and how adverts are used by companies. Children are also introduced to the concept of plagiarism and citation. KS2 Computing National Curriculum Children use technology safely, respectfully and responsibly. They recognise acceptable/unacceptable behaviour and identify a range of ways to report concerns about content and contact. Children can: a reflect on their own digital footprint and behaviour online; b identify what is appropriate and inappropriate behaviour on the internet, recognising the term cyberbullying; c agree and follow sensible online safety	Year 3 and 4 Children working at age related expectations will demonstrate their full understanding of E Safety strands both within their work beyond. They will be able to articulate this to others. Children will also demonstrate this beyond the school/classroom e.g. Use of Apps, Mobile phones used outside of school and on line gaming.	Year 3 and 4 Children who are regularly able to demonstrate total adherence to all E Safety rules and articulate fully and explain the reasoning behind the rues will be considered for Greater Depth.

Recognise	rules, e.g. taking pictures, sharing information, storing		
acceptable/unacceptable	passwords; d seek help from an adult when they see		
behaviour.	something that is unexpected or worrying; e demonstrate		
	understanding of age-appropriate websites and adverts; f		
	use key vocabulary to demonstrate knowledge and		
	understanding in this strand: safe, meet, accept, reliable,		
	tell, online, trusted, adult, information, safety, personal,		
	internet, world wide web, communicate, message, social		
	media, email, password, cyberbullying/bullying, plagiarism,		
	profiles, account, private, public		
	Year 5 and 6	Year 5 and 6	Year 5 and 6
Year 5 and 6	Children are encouraged to identify online risks and share	Children working at age related	Children who are
Understand the	their knowledge of the risks and consequences for people	expectations will demonstrate	regularly able to
opportunities computer	online. They begin to think more critically about what they	their full understanding of E	demonstrate total
networks offer for	see online and look at the concept of fake news and false	Safety strands both within their	adherence to all E
collaboration.	photographs. Computing National Curriculum Children use	work beyond.	Safety rules and
Be discerning in	technology safely, respectfully and responsibly. They	They will be able to articulate this	articulate fully and
evaluating digital content.	recognise acceptable/unacceptable behaviour and identify a	to others.	explain the reasoning
	range of ways to report concerns about content and contact.	Children will also demonstrate	behind the rues will be
	Children can:	this beyond the school/classroom	considered for Greater
	a protect their password and other personal information;b be a good online citizen and friend;	e.g. Use of Apps, Mobile phones used outside of school and on line	Depth.
	c judge what sort of privacy settings might be relevant to reducing different risks;	gaming.	
	d seek help from an adult when they see something that is		
	unexpected or worrying;		
	e discuss scenarios involving online risk;		
	f use key vocabulary to demonstrate knowledge and		
	understanding in this strand: spam, link, privacy, virus, scam,		
	phishing, inbox, junk, sender, subject, secure, safe, account,		
	online, private, social media, adverts, cyberbullying,		
	reporting, anonymous, victim, fraud/fraudulent, policy,		
	private/personal.		