



Progression in Computing at Harry Hotspur CE Primary School



COMPUTING

National Curriculum Expectations

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 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.

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.



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Statutory and Non-Statutory Frameworks:

EYFS		KS1		LKS2		UKS2	
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Development Matters:</p> <p>PSED</p> <ul style="list-style-type: none"> Remember rules without needing an adult to remind them. <p>PD</p> <ul style="list-style-type: none"> Match their developing physical skills to tasks and activities in the setting. <p>UW</p> <ul style="list-style-type: none"> Explore how things work. 	<p>Development Matters:</p> <p>PSED</p> <ul style="list-style-type: none"> Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'. <p>PD</p> <ul style="list-style-type: none"> Develop their small motor skills so that they can use a range of tools competently, safely and confidently. 	<p>National Curriculum</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions create and debug simple programs use logical reasoning to predict the behaviour of simple programs use technology purposefully to create, organise, store, manipulate and retrieve digital content recognise common uses of information technology beyond school use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact 		<p>National Curriculum</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts use sequence, selection, and repetition in programs; work with variables and various forms of input and output use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. 			



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	<p>EAD</p> <ul style="list-style-type: none">• Explore, use and refine a variety of artistic effects to express their ideas and feelings.	<p>on the internet or other online technologies.</p>	
<p>Statutory Framework for the early years foundation stage</p> <p>ELG:</p> <p>PSED</p> <ul style="list-style-type: none">• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.• Explain the reasons for rules, know right from wrong and try to behave accordingly. <p>EAD</p> <ul style="list-style-type: none">• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.			



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Computing at St Michael's CE Primary School

Our computing curriculum recognises that pupils are living in a rapidly changing world in which computing is playing an ever-increasing role. We aim to equip children with the resilience and skills to adapt to new technology and give them confidence to use computing for a variety of purposes. Children understand they must behave responsibly online and respect e-safety rules.



Big Ideas

Computer Science:

We learn the principle of information and computation, how digital systems work and how to put this knowledge to use through programming.

Information Technology:

We learn to create programs, systems and a range of content safely.

Digital Literacy:

We learn how to use, express ourselves and develop ideas safely, through information and communication.

‘Alan Turing gave us a mathematical model of digital computing that has completely withstood the test of time. He gave us very, very clear description that was truly prophetic.’

George Dyson (Scientific historian)



Links with other subjects

- Maths
- handling data
- Science
- Natural and artificial systems
- DT
- Programming, computer aided design

Pedagogy

- Low stakes quizzing for long term memory
- Varied teaching and learning activities
- Thoughtful sequencing of content
- Specific teaching of vocabulary
- Higher order thinking tasks

Progress

- Units of work are carefully sequenced so prior knowledge and concepts are built upon
- Regular formative assessment and assessment for learning (including low-stakes quizzing) ensures gaps are filled
- Effective questioning and higher order thinking features in every lesson
- Progress and attainment within units is recorded and shared with all teaching staff
- Opportunities are provided for revisiting content or applying learning at greater depth.

Links with other subjects

- Maths
- handling data
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- Natural and artificial systems
- DT
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Long term plan over a 2-year cycle:

September 2024 then 2026

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
EYFS	Algorithmic thinking Keyboard and mouse skills		Being a robot Mouse skills in games		Intro to coding Kodable Handling data	
KS1	Computing systems and networks – Technology around us Keyboard and mouse skills	Creating media – Digital photography (RE, Geog, Art)	Creating media – Digital writing Changing Text (J2e – JiT - write)(RE)	Data and information – Pictograms (J2e – JiT - pictogram) (Sci/DT)	Programming A – Moving a robot (Beebot / Blue bot and APP)	Programming B – An introduction to quizzes (Scratch jr app)
LKS2	Computing systems and networks – Connecting computers Input and output - connects, networks and Wi-Fi	Creating media – Audio editing Audacity	Creating media – Desktop publishing Publisher or adobe spark or Picollage (also APP) (Hist/Art)	Data and information – Data logging Arduio Science Journal app (Sci)	Programming A – Sequence in music Scratch or J2code	Programming B – Repetition in games Scratch or J2code
UKS2	Computing systems and networks – Sharing information Systems and devices	Computing systems and networks – Communication World Wide Web Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine (Geog)	Creating media – Video editing Youtube and webcams	Data and information – Spreadsheets Excel and Google Sheets Chocolate (Hist/DT)	Programming A – Selection in physical computing Lego wedo or ozobot	Programming B – Sensing Scratch and review of programming or J2code



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September 2023 then 2025

	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
EYFS	Free play with beebots and programmable toys Whole class use of the Internet		Beebot commands Independent use of digital cameras / devices		Intro to coding Kodable Creating an pictures using a computer	
KS1	Computing systems and networks – IT around us How IT improves our world	Creating media – Digital painting (J2e – JiT - paint)	Creating media – Making music Song Maker	Data and information – Grouping data	Programming A – Robot algorithms (Beebots / Blue bots and J2e – JiT – Turtle)	Programming B – Introduction to animation (J2e – JiT - animate)
LKS2	Computing systems and networks – The Internet Input and output - connects, networks and Wi-Fi	Creating media – Animation Stop-frame animation (iMotion / Stop Motion Studio) (Art)	Creating media – Photo editing getpaint.net/ (Spanish/Art)	Data and information – Branching databases (J2e – JiT - branch) (Sci)	Programming A – Repetition in shapes turtleacademy.com or Scratch or J2code	Programming B – Events and actions (Scratch jr app) or J2code
UKS2	Computing systems and networks – Communication Searching the web (Geog)	Creating media – Vector drawing Google Drawings	Creating media – Web page creation Wix	Data and information – Flat-file databases (J2data) (Science)	Programming A – Variables in games Scratch or J2code	Programming B – Selection in quizzes Scratch or J2code

<https://teachcomputing.org/> EYFS – separate source



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Skills Progression	EYFS	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Information Technology: Word Processing/ Typing	<ul style="list-style-type: none"> • I can play on a touch screen game and use computers/keyboards/mouse in role play • I can type letters with increasing confidence using a keyboard and tablet. • I can dictate short, clear sentences into a digital device 	<ul style="list-style-type: none"> • I can confidently type words quickly and correctly on a digital device. • I can use the space bar to make space and delete to delete letters/words • I can make a new line using enter/return • I can dictate into a digital device more accurately and with punctuation. 					
Information Technology: Photography and Digital Art		<ul style="list-style-type: none"> • I can edit a photo with simple tools • I can use a paint/drawing app to create a digital image • I can begin to cut out an image to layer on another image. 	<p>I can edit a photo (crop, filters, mark up etc)</p> <ul style="list-style-type: none"> • I can select and use tools to create digital imagery - controlling the pen and using the fill tool • I can cut images with accuracy to layer on other images 	<ul style="list-style-type: none"> • I can confidently take and manipulate photos • I can create a digital image using a range of tools, pens, brushes and effects 	<ul style="list-style-type: none"> • I can enhance digital images and photographs using crop, brightness, contrast & resize • I can manipulate shapes to create digital art 		
Information Technology: Data Handling	<p>I can identify a chart.</p> <ul style="list-style-type: none"> • I can sort physical objects, take a picture and discuss what I have done. • I can present simple data on a digital device 	<ul style="list-style-type: none"> • I can sort images or text into two or more categories on a digital device. • I can collect data on a topic. 	<ul style="list-style-type: none"> • I can sort digital objects into a range of charts such as Venn diagrams, Carroll diagrams and bar charts using different 	<ul style="list-style-type: none"> • I can create my own sorting diagram and complete a data handling activity with it using images and text. 	<ul style="list-style-type: none"> • I can create my own online multiple choice questionnaire. • I can input data into a spreadsheet and export 	<ul style="list-style-type: none"> • I can create and publish my own online questionnaire and analyse the results. • I can use simple formulae to solve 	



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Skills Progression	EYFS	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
		<ul style="list-style-type: none"> I can create a tally chart and pictogram. I can record myself explaining what I have done and what it shows me. 	apps and software. <ul style="list-style-type: none"> I can orally record myself explaining what the data shows me. I can create a branching database using questions 	<ul style="list-style-type: none"> I can start to input simple data into a spreadsheet. I can create a feelings chart exploring a story or character's feelings. 	the data in a variety of ways: charts, bar charts, pie charts. <ul style="list-style-type: none"> I understand how data is collected 	calculations including =sum and other statistical functions <ul style="list-style-type: none"> I can edit and format difference cells in a spreadsheet 	
Information Technology: Presentations, web design and eBook Creation				I can create an interactive comic with sounds, formatted text and video. <ul style="list-style-type: none"> I can annotate an image with videos I can create a simple web page. 			I can create a web site which includes a variety of media. <ul style="list-style-type: none"> I can design an app prototype that links multimedia pages together with hyperlinks. I can choose applications to communicate to a specific audience. I can evaluate my own content and consider ways to improvements
Information Technology: Animation				I can create animations of faces to speak in role with more life-like realistic outcomes. <ul style="list-style-type: none"> I can improve stop motion animation clips 			



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Skills Progression	EYFS	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
				with techniques like onion skinning. • I can use animation tools in presenting software to create simple animations.			
Information Technology: Video Creation						I can use cutaway and split screen tools in iMovie. • I can evaluate and improve the best video tools to best explain my understanding. • I can further improve green screen clips using crop and resize and explore more creative ways to use the tool - wearing green clothes and the masking tool	I can use the green screen masking tool with more than one character. • I can use picture in picture tools in iMovie. • I can add animated subtitles to my film to further enhance my creation. • I can create videos using a range of media - green screen, animations, film and image
Information Technology: Sound			• Create a musical composition using software • I can record my own sound effects. • I can record my voice over a		Edit sound effects for a purpose. • Create a simple four chord song following the correct rhythm. • I can record a radio broadcast or audiobook		



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Skills Progression	EYFS	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
			compositions to perform a song				
Computer Science: Computational Thinking	I can follow simple oral algorithms <ul style="list-style-type: none"> I can spot simple patterns I can sequence simple familiar tasks 	<ul style="list-style-type: none"> I understand what algorithms are I can write simple algorithms I understand the sequence of algorithms is important I can debug simple algorithms I understand that algorithms are implemented as programs on digital devices 	<ul style="list-style-type: none"> I can write algorithms for everyday tasks I can use logical reasoning to predict the outcome of algorithms I understand decomposition is breaking objects/processes down I can implement simple algorithms on digital devices (Bee Bots, Apps: Daisy the Dino) I can debug algorithms 	I can create algorithms for use when programming <ul style="list-style-type: none"> I can decompose tasks (such as animations) into separate steps to create an algorithm I understand abstraction is focusing on important information I can identify patterns in an algorithm I can use repetition in algorithms 	I can use abstraction to focus on what's important in my design <ul style="list-style-type: none"> I can write increasingly more precise algorithms for use when programming. I can use simple selection in algorithms I can use logical reasoning to detect and correct errors in programs 	I can solve problems by decomposing them into smaller parts <ul style="list-style-type: none"> I can use selection in algorithms I can recognise the need for conditions in repetition within algorithms I can use logical reasoning to explain how a variety of algorithms work I can use logical reasoning to detect and correct errors in algorithms I can evaluate my work and identify errors 	I can recognise, and make use, of patterns across programming projects <ul style="list-style-type: none"> I can write precise algorithms for use when programming I can identify variables needed and their use in selection and repetition I can decompose code into sections for effective debugging I can critically evaluate my work and suggest improvements
Computer Science: Coding and Programing	I can use a mouse, touch screen or appropriate access device to target and select options on screen <ul style="list-style-type: none"> I can input a simple sequence of commands to control a digital device with support (Bee Bot) 	I can create a simple program e.g. sequence of instructions for a Bee Bot <ul style="list-style-type: none"> I can use sequence in programs I can 	I understand programs execute by following precise and unambiguous instructions <ul style="list-style-type: none"> I can create programs on a variety of digital devices 	I can design and create programs <ul style="list-style-type: none"> I can write programs that accomplish specific goals I can use repetition in programs I can 	<ul style="list-style-type: none"> I can use simple selection in programs I can work with various forms of output I can use logical reasoning to systematically detect and correct errors in programs 	I can create programs by decomposing them into smaller parts <ul style="list-style-type: none"> I can use selection in programs I can use conditions in repetition commands 	I can use a range of sequence, selection and repetition commands combined with variables as required to implement my design



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Skills Progression	EYFS	Key Stage 1	Lower Key Stage 2		Upper Key Stage 2	
		locate and fix bugs in my program <ul style="list-style-type: none"> • I can debug programs of increasing complexity • I can use logical reasoning to predict the outcome of simple programs 	work with various forms of input <ul style="list-style-type: none"> • I can work with various forms of output 	<ul style="list-style-type: none"> • I can work with variables • I can create programs that control or simulate physical systems • I can evaluate my work and identify errors 	<ul style="list-style-type: none"> • I can create procedures to hide complexity in programs • I can identify and write generic code for use across multiple projects • I can critically evaluate my work and suggest improvements • I can identify and use basic HTML tags (See Computer Networks objectives) 	
Computer Science: Computer Networks (KS2 only)			<ul style="list-style-type: none"> • I understand that computers in a school are connected together in a network • I understand why computers are networked • I understand the difference between the Internet and the World Wide Web (WWW) 	<ul style="list-style-type: none"> • I understand that servers on the Internet are located across the planet • I understand how email is sent across the Internet • I understand how the Internet enables us to collaborate 	<ul style="list-style-type: none"> • I understand how we view web pages on the Internet • I use search technologies effectively • I understand that web spiders index the web for search engines • I appreciate how pages are ranked in a search engine 	<ul style="list-style-type: none"> • I understand what HTML is and recognize HTML tags • I know a range of HTML tags and can remix a web page • I can create a webpage using HTML



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Promoting SMSC and British Values in Computing

Spiritual	Moral	Social	Cultural
<ul style="list-style-type: none"> • Online Interactions—E-Safety • Respect others and themselves. • Values, principles and beliefs. • Understanding feelings, emotions and impact. • An appreciation of the intangible 	<ul style="list-style-type: none"> • E-Safety / Online. • Collaborative working—respect (coding, making films). • Respect for others’ feelings. 	<ul style="list-style-type: none"> • E-Safety / Online. • Working collaboratively on projects. • Appreciate rights and responsibilities. 	<ul style="list-style-type: none"> • Online interactions—E-Safety. • Using range of cultural pics/names etc for creating publishing. • Use language & understand images / icons.

Democracy	The Rule of Law	Individual Liberty	Respect	Tolerance of those with different faiths
<ul style="list-style-type: none"> ○ In computing we are learning to understand and be considerate to the views of other internet users. ○ We understand that we are each part of the democracy of the internet and that we can each, in our own small way, affect the way the internet exists. 	<ul style="list-style-type: none"> ○ In computing we understand the use of rules on computers and the internet, such as when we are allowed to use social media and what we are allowed to post and share. ○ We understand that rules are to keep others and ourselves safe and to help the internet to 	<ul style="list-style-type: none"> ○ In computing we understand how to use our right to freedom of speech in a respectable and thoughtful way, being considerate of how this speech will affect others. ○ We understand the freedom the internet and computers offer us in discovering 	<ul style="list-style-type: none"> ○ In computing we appreciate and understand the views of others, our right to challenge, question and discuss opinions and views, and to do this in a respectable and thoughtful way. ○ We understand that as we are connected with the world while 	<ul style="list-style-type: none"> ○ In computing we understand that we are connected to people across the whole world. We understand that these are people from different communities, cultures, faiths and beliefs. ○ We use the opportunities offered in computing to question,



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	be an enjoyable and engaging place.	information and connecting us with the world.	accessing the internet, we are exposed to the widest range of views, and we are learning to respect them.	challenge and understand people with these different characteristics to support and develop our tolerance of them.
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