

Key Stage 3 Subject Timeline

Subject: Computer Science

Exam Board: N/A

Year 7						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	E-Safety and Using Chromebooks	Computational thinking and Algorithms	Scratch and Programming concepts	Spreadsheets and presenting data	Graphics and following a rubric/BAFTA YGD	HTML – creating web pages
Key skills and Concepts	<p>Focus on the development of ICT and online safety including:</p> <ul style="list-style-type: none"> - Digital footprint - Online safety course - Use of strong passwords - Relationships online -email etiquette -Saving documents - Opening and editing documents - Collaborative working - using Google Classroom - Using Sam learning 	<p>Focus on the development of computational thinking skills including:</p> <ul style="list-style-type: none"> -Bebras Competition - Decomposition and abstraction: breaking down problems, identifying key components, modelling real-world scenarios - Algorithmic thinking: designing, following, and writing algorithms using flowcharts, pseudocode, and program code - Applying sequence, selection, repetition, and iteration in algorithm design - Translating algorithms into working 	<p>Focus on developing algorithms into block-based coding</p> <ul style="list-style-type: none"> -Using Variables - Primitive data types (int, float, bool, str) - Input/output (print(), input()), type conversion - Arithmetic and logical operators <p>Create a working game</p>	<p>Focus on the development of analytical skills:</p> <ul style="list-style-type: none"> -Identifying elements of a spreadsheet -Recognising real life uses of spreadsheets and data produced -Create formulae for simple arithmetic -Simplify functions using autofill - Search and sort data in a spreadsheet - Create graphs and charts 	<p>Focus on creative digital media and its uses</p> <ul style="list-style-type: none"> - Identify differences between vector and bitmap images - Recognises uses for both - Manipulating images using application software – Gimp - Create original images using Inkscape - Creating rules and designs for an original game concept - Creating a playable, original game concept 	<ul style="list-style-type: none"> - Identifying elements in HTML coding - Creating tags - Creating headings - Adding images - Using CSS styling to improve output - Add hyperlinks for accessibility - Create an informative webpage
Threshold Concepts	Every online action leaves a lasting trace; responsible choices and self-monitoring online shape personal and public identity. Awareness of threats, ethical behaviour, and understanding one’s rights and responsibilities as a digital citizen. Interactions online require critical evaluation, empathy, and understanding of boundaries	Allowing students to isolate key elements, tackle sub-tasks, and integrate solutions effectively. Abstraction enables students to work with concepts at different levels of detail. With Bebras Students face problem-based, context-rich tasks designed to foster and assess these computational thinking skills. Activities are designed to	Realising that algorithms— step-by-step methods for solving problems— can be directly mapped to visual building blocks, each representing a computational action or logic structure. Students progress from just following instructions to designing modular, reusable, and logical code sequences that machines can execute. Experiencing the "Eureka!"	Recognising that spreadsheets are powerful tools for organising, managing, and interpreting real-world data—not just for math, but for event planning, budgeting, meal planning, list management, and more. Internalising that the data produced—summaries, analyses, charts—supports evidence-based decision-	Mastering that the <i>essence</i> of an image—pixels vs. mathematical paths—dictates how it can be scaled, edited, and used. Knowing <i>when and why</i> to choose a format based on the intended purpose and required flexibility. Moving from thinking in terms of “drawing pixels” to “assembling objects and paths” that can be endlessly modified without losing	Moving from a focus on visual outcomes to understanding that each part of a webpage (headings, images, links) is an <i>element</i> with purpose, attributes, and semantics, not just a "look." Seeing a webpage as a tree-structure of elements (DOM—Document Object Model) is transformative. Realising that an informative webpage

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	and authenticity to foster safe relationships	develop core algorithmic and structural thinking	moment when abstract coding concepts combine into a functioning, engaging digital product, demonstrating mastery of the computational thinking cycle.	making and communication. Comprehending that visualisation tools (like bar, line, and pie charts) convert raw data into visual stories, making trends and relationships accessible at a glance	definition. Realising that a playable game is more than the sum of its parts—it emerges from the <i>integration</i> of design, logic, and implementation, and is improved through iterative testing and refinement.	results from <i>systematically combining</i> tags, structure, content, media, links, and styling—moving from isolated code fragments to a coherent, usable, and accessible page
Endpoints	<ul style="list-style-type: none"> - Students will complete an online safety course to identify online risks, use reporting mechanisms, and apply safe online practices. - Students will understand the concept of a digital footprint and how their online actions can affect their long-term reputation and privacy. - Students will use Google Classroom to access resources, complete assignments, communicate with teachers, and manage feedback. 	<ul style="list-style-type: none"> - Students will break down complex problems into manageable parts through decomposition and abstraction, identifying essential elements and modelling scenarios drawn from real life. - Students will develop algorithmic thinking by designing, following, and writing algorithms using tools such as flowcharts, pseudocode, and program code - Students will compete in the Bebras computational thinking competition 	<ul style="list-style-type: none"> - Students will use variables to store, update, and retrieve data within their block-based programs. - Students will identify and apply primitive data types such as integers, floats, Booleans, and strings in programming tasks. - Students will design and create a working game using block-based coding that incorporates variables, user input, data types, and logical conditions 	<ul style="list-style-type: none"> - Students will identify and describe main elements of a spreadsheet such as cells, columns, rows, and ranges. - Students will create and use simple arithmetic formulae and functions, utilising features like autofill to streamline calculations. - Students will search, sort, and visually present data by creating graphs and charts in a spreadsheet. 	<ul style="list-style-type: none"> - Student will identify and explain key differences between vector and bitmap images and recognise practical uses for each type of graphic. - Student will manipulate and create original digital images using application software such as GIMP and Inkscape. - Student will design rules for an original game concept and develop a playable, original game using their own graphics and assets. 	<ul style="list-style-type: none"> - Students will create structured webpages using proper HTML tags, including headings, images, and hyperlinks for clear, accessible content. - Students will enhance webpage design and presentation using CSS for styling. - Students will build an informative webpage that integrates images, styled content, and accessible navigation links.
Assessment	<ul style="list-style-type: none"> ✓ OSA certificates 	<ul style="list-style-type: none"> ✓ Completion of Bebras online competition ✓ Assessment: Given a real-world problem, students produce a decomposition, flowchart, pseudocode, and a coded solution 	<ul style="list-style-type: none"> ✓ Project: Create a playable game using variables, input, process and output 	<ul style="list-style-type: none"> ✓ Assessment: Identification of spreadsheet elements and terminology and graphic representation of data in graph or chart. 	<ul style="list-style-type: none"> ✓ Project: completion of game concept showing rules, original characters, objects and artistic backgrounds for 3 different levels 	<ul style="list-style-type: none"> ✓ Project: Create an informative web page showing headings, emphasis colour and hyperlinks

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Cultural Capital	<ul style="list-style-type: none"> ✓ Coding club ✓ students are building essential digital cultural capital—the knowledge, behaviours, and skills that empower them to participate safely, confidently, and responsibly in the digital world. 	<ul style="list-style-type: none"> ✓ Coding club (logic puzzles, text-based games); interdisciplinary projects (using data from other subjects); algorithmic thinking workshops. BEBRAS challenge. Problem-solving workshops; links to engineering and business (process modelling) 	<ul style="list-style-type: none"> ✓ Building foundational programming knowledge helps students grasp the core principles behind all forms of coding, preparing them for further study or careers in digital fields ✓ This growing understanding of how to build, adapt, and interact with code not only supports academic achievement but also enhances students’ ability to participate meaningfully in the digital world and future economy 	<ul style="list-style-type: none"> ✓ Essential digital literacy: Understanding how to organize, calculate, and visualize data with spreadsheets prepares students for everyday life, higher education, and the workplace, where data handling skills are increasingly valued ✓ Development of problem-solving and independence: Experimenting with formulas, functions, and data presentation nurtures logical thinking, attention to detail, and a growth mindset, helping students become resilient and adaptable learners 	<ul style="list-style-type: none"> ✓ Critical awareness of image authenticity: Engaging in digital image manipulation helps students understand both the creative possibilities and ethical considerations of this practice. They learn that manipulated images can shape perceptions, blur the lines between reality and fiction, and carry both creative and social responsibility. ✓ Game design and digital storytelling: By developing their own playable game with original assets, students combine coding, design principles, and narrative thinking 	<ul style="list-style-type: none"> ✓ Empowerment as creators, not just consumers: By moving from viewing to building the web, students gain agency, creativity, and practical skills that underpin many fields in the modern economy—ranging from business to media, technology, and beyond ✓ Transferable skills for lifelong learning: Building webpages develops attention to detail, logical thinking, and project management, as well as fostering independence and resilience through iterative design and improvement
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Year 8						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	Working with AI	Data Representation: Advanced Spreadsheets and project planning	Data Representation II: Binary Characters, Images & Sound,	Graphics and Project Design	Programming Languages: Python	Cybersecurity and Networking
Key skills and Concepts	<p>Focus on uses, dangers and benefits of AI</p> <ul style="list-style-type: none"> - Code Scratch to respond to user input - Output text in response to user input - Create decision statements - Creating a chat bot in Scratch - Effectively question an AI program - Use AI to help me learn - Recognise Smart cities and use of AI 	<p>Focus on Presenting data to specific audiences to inform and educate</p> <ul style="list-style-type: none"> - Analyse and interpret data in a spreadsheet - Create materials to inform and educate - Identify demographics considered when choosing a target audience - Create materials for specific audience - Complete a task using a client brief - Meet success criteria within a timeframe 	<p>Focus on data representation using binary</p> <ul style="list-style-type: none"> - Explain why computers use binary - Recognise number systems – base 10, and base 2 - Convert between base 10 and base 2 - Identify binary used to convert letters into 7-bit ASCII character - Create and decode Bitmap images in binary - Explain analogue and digital sound - Understand the use of binary in representation of sound 	<p>Focus on applications and AI used to create images</p> <ul style="list-style-type: none"> - Differentiating bitmap graphics from vector graphics - Using layers to combine images - Creating original digital artwork - Investigating use of AI in image creation - I can interpret and implement a client brief - respond to feedback and improve work - Work to a deadline 	<p>Focus on Programming languages: Python Basics</p> <ul style="list-style-type: none"> - Identifying data types in Python - Creating and using variables - Implementing logic decisions - Combining coding to create a simple Python game - Improving on game by using definitions - Debugging simple Python code 	<p>Focus on Cybersecurity and how this is used in a network</p> <ul style="list-style-type: none"> - Explain why computers are connected in a network - Discuss types of networks (LAN, WAN) - Investigating wired vs wireless connectivity and performance - Understand the need for Firewalls - Explain types of malware <ul style="list-style-type: none"> o Virus o Worm o Trojan o Bots - Determine methods of preventing malware from affecting networks
Threshold Concepts	<ul style="list-style-type: none"> - Mastering the way AI responds to human input lets us create meaningful, interactive digital agents while highlighting how algorithms can interpret—and sometimes misinterpret—what people say. 	<ul style="list-style-type: none"> - the realisation that data has little impact unless it is presented with empathy and strategic thought for the intended audience, shifting focus from purely factual reporting to purposeful communication. - deconstruct a client brief, extract core objectives 	<ul style="list-style-type: none"> - Recognising that all forms of digital media—letters, pictures, and sounds—are fundamentally binary allows learners to fully comprehend how computers achieve universal and flexible data processing 	<ul style="list-style-type: none"> - Investigating AI’s role reveals questions about creativity, ethics, and authorship but also offers new capabilities for responding rapidly to client needs, generating variations, and integrating feedback efficiently. 	<ul style="list-style-type: none"> - These threshold concepts move learners from writing isolated lines of code to engineering, testing, and improving structured, interactive software in Python 	<ul style="list-style-type: none"> - Understanding the purpose and structure of networks is foundational to recognising where and why cybersecurity measures are necessary. - These threshold concepts shift learners’ perspectives from viewing networks as simple connections to

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	<ul style="list-style-type: none"> - AI technologies shape how we live and learn, from personal learning tools to city-wide smart systems. Recognising these applications arms you with the knowledge to innovate and adapt 	<ul style="list-style-type: none"> (content, tone, delivery style), and translate these into concrete, actionable steps. - Cultivate the discipline to work effectively within specified timeframes, adjusting your process as needed to balance quality and deadlines 		<ul style="list-style-type: none"> - Effective use of AI in digital art requires understanding both its power (speed, idea generation, complexity) and its constraints (potential for bias, originality concerns, over-reliance on automation). 		<ul style="list-style-type: none"> dynamic digital ecosystems requiring strong, context-dependent security protocols to operate safely and reliably.
Endpoints	<ul style="list-style-type: none"> - Students can explain how AI systems can respond to user input and code a simple chatbot in Scratch to demonstrate how chatbots can personalise user experience through automated decision-making 	<ul style="list-style-type: none"> - Students can create materials (e.g., reports, infographics, presentations) that communicate data-driven messages tailored to a specified demographic - Students can interpret a client brief to develop and deliver a data presentation or educational material that meets defined success criteria and is completed within a set timeframe 	<ul style="list-style-type: none"> - Students can explain binary's role in computers and can convert between denary, binary, and hexadecimal. - Students can create binary images and discuss how binary is used to convey sound 	<ul style="list-style-type: none"> - Students can distinguish between bitmap and vector graphics and apply the correct image type for a given design scenario - Students can analyse the role and effectiveness of AI in generating or enhancing images by experimenting with AI-powered tools and critically reflecting on their output, comparing the creative process and results with traditional methods 	<ul style="list-style-type: none"> - Students can apply Python Constructs in Practical Tasks as well as analyse output based on input and process to ascertain accuracy. - Students can also debug to improve on and ensure accuracy of coding. 	<ul style="list-style-type: none"> - Students Learners will be able to describe why computers are connected in networks and explain the differences between LAN and WAN - Students can identify common types of malware (virus, worm, trojan, bots) and demonstrate appropriate methods for preventing malware from affecting networks, such as using firewalls, software updates, and safe user practices.
Assessment	Assessment via quiz and Scratch chatbot produced	Project: spreadsheet and poster created	Project: poster created showing binary in action with sound, characters, images and numbers represented	Project: AI magazine cover for specified audience and purpose	Assessment – application of Python in short programming tasks	Assessment: Students will label diagrams and answer short and multiple choice questions

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Cultural Capital	<ul style="list-style-type: none"> ✓ Engaging with essential aspects of 21st-century technology and communication that are highly relevant in the modern digital world ✓ Gain insight into how AI shapes digital interactions—from customer service to social media and smart devices—enhancing their ability to navigate, question, and contribute meaningfully in AI-driven environments 	<ul style="list-style-type: none"> ✓ Understand the power of data in shaping public understanding, marketing, education, and policy, deepening their awareness of how information influences decisions in modern society ✓ Prepare students to be competent, confident, and responsible contributors to the digital economy and civic life, strengthening their readiness for future learning, employment, and engagement in a data-informed world 	<ul style="list-style-type: none"> ✓ Cultural and historical awareness: Appreciating the origins and impact of binary and digital representation connects students with major milestones in human creativity and technological achievement ✓ Insight into digital representation: Recognizing how text, images, and sound are encoded enables students to move beyond seeing computers as “black boxes” and to appreciate the logic and creativity involved in digital innovation 	<ul style="list-style-type: none"> ✓ Critical engagement with emerging technology: By experimenting with AI-powered image-generation tools and reflecting on the differences compared to traditional methods, students deepen not only their technical expertise but also their evaluative skills. They gain firsthand experience in how AI is reshaping creativity, productivity, and authorship in visual communication ✓ Awareness of contemporary debates: Students are positioned to participate in ongoing discussions about authenticity, originality, and ethical issues related to AI in art and design—a key aspect of digital citizenship and cultural literacy in a media-rich society 	<ul style="list-style-type: none"> ✓ Confidence in technology: The ability to build, analyse, and improve their own programs helps students become active participants in the digital world rather than passive users, demystifying technology and empowering creative exploration ✓ Transferable skills for the future: Debugging and accuracy-checking reinforce critical thinking and attention to detail; qualities sought after in STEM fields and beyond. Python’s widespread use in everything from web development to AI and science means these abilities have direct relevance to current and emerging careers 	<ul style="list-style-type: none"> ✓ Core digital knowledge and everyday relevance: Understanding how and why devices connect through networks, and what distinguishes LANs and WANs, gives students foundational insight into how modern communication, businesses, education, and entertainment systems operate ✓ Career-ready knowledge: Networking and cybersecurity form the backbone of many careers in technology, and early understanding helps widen access to those opportunities and develop applicable skills for future progression in IT, computer science, and digital infrastructure roles.
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