



Computer Science	Working towards expected outcomes	Working at expected outcomes	Working beyond expected outcomes
<b>Year 8</b>	Your child is not yet making the expected progress within this course.	Your child is achieving the expected progress for this point within the course.	Your child is working beyond the expected progress for this point within the course.
<b>Autumn 1</b> E-Safety, Binary and Logic	<p>Students working <b>towards</b> expected outcomes in Year 8 can:</p> <p>Understands basic online safety principles but struggles to apply them to real-world scenarios.</p> <p>Beginning to recognise binary as a number system but cannot convert between binary and decimal independently.</p> <p>Can identify AND/OR/NOT symbols but needs help interpreting or completing simple logic problems.</p>	<p>Students working <b>at</b> expected in Year 8 can:</p> <p>Can apply online safety knowledge to everyday digital scenarios (SCAMS).</p> <p>Can convert between simple binary and decimal numbers with accuracy.</p> <p>Understands AND, OR, NOT logic operations and can complete basic truth tables.</p> <p>Recognises that computers store and process information using binary.</p>	<p>Students working <b>beyond</b> expected in Year 8 can:</p> <p>Shows strong digital literacy, confidently applying online safety strategies in unfamiliar situations.</p> <p>Converts between binary and decimal fluently and can explain why binary is used in computing.</p> <p>Can use logic to solve multi-step problems and explain how logic underpins decision making in computing systems.</p> <p>Begins to make links between binary, logic gates, and computational thinking.</p>
<b>Autumn 2</b> Bebras and Python	<p>Attempts computational thinking problems but finds it difficult to apply strategies such as decomposition, sequencing, or logical reasoning without guidance.</p> <p>Can write simple Python statements (e.g., print) but struggles to use variables correctly or apply them in problem-solving.</p> <p>Needs significant support to understand and use selection (if statements) in programs.</p> <p>Finds iteration (loops) challenging and requires step-by-step guidance to write or debug loop structures.</p> <p>Struggles to break problems into manageable parts and translate them into working code.</p>	<p>Can describe the contributions of well-known computer scientists and explain how their work relates to modern computing.</p> <p>Applies computational thinking skills (decomposition, pattern recognition, logical reasoning) to solve Bebras-style problems with some independence.</p> <p>Writes simple Python programs using variables to store and manipulate data.</p> <p>Uses selection (if/elif/else) to control program flow in straightforward scenarios.</p> <p>Can write basic iteration structures (for and while loops) to repeat actions when needed.</p>	<p>Gives detailed explanations of the contributions of several computer scientists and links their ideas to real-world technologies and programming.</p> <p>Uses advanced computational thinking strategies, such as abstraction and optimisation, to solve complex challenge problems.</p> <p>Writes well-structured Python programs using variables, selection, and iteration confidently and independently.</p> <p>Demonstrates strong debugging skills, identifying and correcting both syntax and logic errors.</p> <p>Designs and implements solutions to multi-step problems, showing clear decomposition and logical structure.</p>



		Breaks down structured problems into steps and translates these into working code with teacher guidance when necessary.	Experiments beyond the taught content (e.g., nested loops, functions, extended logic) to enhance program functionality.
<b>Spring 1</b> Excel and Databases	<p>Can write simple Python programs but struggles to use while loops independently or correctly.</p> <p>Often creates loops that do not run as intended (e.g., infinite loops or incorrect conditions).</p> <p>Needs considerable support during the programming assessment to recall and apply key concepts such as variables, selection, and iteration.</p> <p>Can enter data into Excel but struggles to organise it (e.g., formatting, sorting, filtering).</p> <p>Finds it difficult to use formulas or interpret data meaningfully.</p> <p>Requires guidance to understand how databases store information using fields, records, and tables.</p> <p>Can complete very simple queries but struggles with criteria, filtering, or multi-criteria searches.</p>	<p>Can use while loops effectively to control the flow of a Python program and explain how loop conditions work.</p> <p>Demonstrates secure understanding of core programming concepts during the assessment.</p> <p>Organises data in Excel using key tools such as sorting, filtering, cell formatting, and simple formulas (SUM, AVERAGE).</p> <p>Uses Excel to analyse data and draw sensible conclusions.</p> <p>Understands database structure and can create a table with appropriate fields and data types.</p> <p>Runs simple queries using single or combined criteria (AND/OR) to retrieve information.</p> <p>Understands how programming and data tools can be used together to solve practical, real-world problems.</p>	<p>Writes efficient, well-structured Python programs using while loops, input validation, and logical control flow.</p> <p>Performs strongly in the programming assessment, showing excellent debugging skills and independent problem-solving.</p> <p>Uses more advanced Excel features such as conditional formatting, multi-level sorting, charts, and nested formulas.</p> <p>Interprets real datasets confidently, explaining trends, patterns, and insights clearly.</p> <p>Designs well-structured databases with appropriate data types and validation rules.</p> <p>Writes complex multi-criteria queries and can explain how they work.</p> <p>Demonstrates clear understanding of how programming and data-handling techniques work together, applying them creatively to real-world scenarios.</p>
<b>Spring 2</b> The Internet	Can complete simple tasks in a database but struggles to run meaningful queries or understand how data is structured across fields and records.	<p>Understands how databases organise information using fields, records, and tables, and can run appropriate queries to retrieve data.</p> <p>Can explain how networks connect devices and describe, in simple terms, how data travels</p>	<p>Demonstrates strong understanding of how databases work, including complex queries, validation, and how data structures support real-world information systems.</p> <p>Explains clearly how data is transmitted across networks using packets, addressing, and key components such as routers, switches, and servers.</p>



	<p>Finds it difficult to explain how data is stored, retrieved, or organised within database systems.</p> <p>Has a basic idea of what a network is but struggles to describe how data moves between devices or across the internet.</p> <p>Confuses network components (e.g., routers, switches) or requires support to understand their roles.</p> <p>Has limited understanding of who controls online systems or how governance and ownership affect the information people see.</p> <p>Can identify examples of Internet of Things devices but struggles to explain how they communicate or their impact.</p> <p>Requires support to discuss ethical or societal issues in computing, often giving simple opinions without reasoning or examples.</p>	<p>across different types of networks and the internet.</p> <p>Understands that online systems are controlled by organisations, governments, and service providers, and can explain how this affects access and information.</p> <p>Can describe what IoT devices are, how they communicate, and their benefits in everyday life.</p> <p>Identifies ethical, legal, and societal issues related to computing, including privacy, digital rights, and access to technology.</p> <p>Can describe the impact of important figures in computing and link their contributions to modern systems and technologies.</p> <p>Understands the structure and purpose of connected systems and can explain their impact on modern society.</p>	<p>Shows advanced understanding of internet governance, including issues around data ownership, global infrastructure, and the role of large technology companies.</p> <p>Analyses the benefits and risks of Internet of Things devices, including security vulnerabilities, privacy issues, and societal impact.</p> <p>Discusses ethical and societal issues with maturity, offering well-reasoned arguments and using real-world examples (e.g., bias in algorithms, digital surveillance, global inequalities).</p> <p>Makes thoughtful connections between historical figures, modern innovators, and today's connected technologies.</p> <p>Demonstrates deep understanding of the structure and influence of connected systems, using detailed explanations and critical thinking.</p>
<p><b>Summer 1</b>  <b>Images, Sound and Compression</b></p>	<p>Can recognise that computers store images and sound using numbers but struggles to explain how this works or what data is being stored.</p> <p>Finds it difficult to understand key concepts such as pixels, sampling, resolution, or bit depth without step-by-step support.</p> <p>Can identify that larger files take up more space but struggles to explain why file size changes with quality.</p>	<p>Can explain how images are represented digitally using pixels, resolution, and colour depth, and understands how these factors affect quality and file size.</p> <p>Understands how sound is represented digitally through sampling, sample rate, and bit depth.</p> <p>Can describe the difference between lossy and lossless compression and give examples of when each is used.</p>	<p>Gives clear and detailed explanations of image and sound representation, including how pixel data, sampling theory, and bit patterns are used in digital systems.</p> <p>Can calculate file sizes using resolution, colour depth, sample rate, and duration, and explain how adjustments impact quality and storage.</p> <p>Demonstrates deep understanding of lossy and lossless compression, comparing their advantages, limitations, and use cases with real-world examples.</p>



	<p>Has limited understanding of the difference between lossy and lossless compression and may confuse how each method works.</p> <p>Needs guidance to analyse examples of compressed images or audio and to describe what changes have occurred.</p> <p>Requires support to revise key concepts and recall prior knowledge linked to KS4 foundations.</p>	<p>Can explain why compression is necessary and how it helps reduce storage or transmission time.</p> <p>Analyses simple examples of compressed data and can describe differences in quality or file size.</p> <p>Uses revision strategies effectively to consolidate learning and recall key information in preparation for GCSE content.</p>	<p>Analyses compressed media critically, explaining the technical reasons for quality loss or efficiency gains.</p> <p>Shows emerging GCSE-level thinking by connecting data representation to wider topics such as bandwidth, storage capacity, and system performance.</p> <p>Uses advanced revision strategies, retrieves knowledge confidently, and explains concepts to others with clarity.</p>
<p><b>Summer 2</b> Cyber Security and AI</p>	<p>Can identify some basic online threats but struggles to explain how cyber attacks work or how to protect themselves effectively.</p> <p>Finds it difficult to recognise social engineering techniques and may not understand how attackers manipulate trust.</p> <p>Has a limited understanding of what AI is and may confuse it with general automation or simple programmed behaviour.</p> <p>Struggles to explain how machines are trained or how they interpret images, voice, or patterns in data.</p> <p>Can identify a few real-world AI applications but cannot fully explain how they work or why they are used.</p> <p>Needs support to express opinions on ethical issues such as AI bias, decision-making, or privacy.</p>	<p>Understands what cybersecurity is and can explain common online threats such as phishing, malware, and social engineering tactics.</p> <p>Knows how to protect themselves online using secure passwords, privacy settings, and careful evaluation of online content.</p> <p>Understands the basics of how AI systems are trained using large datasets and how this affects their decision-making.</p> <p>Can explain how AI recognises images and voice patterns at a simple level (e.g., identifying features, matching patterns).</p> <p>Identifies a range of AI applications (recommendation systems, virtual assistants, facial recognition) and can explain their purpose.</p> <p>Can discuss ethical questions about AI such as bias, fairness, and whether machines should make decisions in certain situations.</p>	<p>Provides detailed explanations of cybersecurity risks, including how social engineering exploits human behaviour and how attacks can be prevented.</p> <p>Gives mature, thoughtful advice on digital safety, including advanced strategies such as multi-factor authentication and evaluating online trustworthiness.</p> <p>Explains AI training processes clearly, including the role of data quality, bias, and how models improve through iteration.</p> <p>Demonstrates strong understanding of how AI processes images and audio through feature extraction and pattern matching.</p> <p>Evaluates real-world AI systems critically, considering benefits, risks, limitations, and long-term social implications.</p> <p>Engages deeply with ethical debates (e.g., bias in training data, surveillance, autonomous decision-making) using well-reasoned arguments.</p>



			Shows emerging GCSE-level understanding by linking AI and cybersecurity to broader concepts such as algorithms, data representation, and networks.
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