

Computer Science Curriculum Map 2025/26

Our specialisms: Fundamentals of components of a computer, networking & the internet, programming and Different way computers represent data.

KS3 Computer Science

Over three years, students build a strong foundation in computer science, exploring a variety of essential topics and skills. They learn about e-safety, the inner workings of computer components, malware, laws affecting technology, logic gates, and network topologies. Alongside technical knowledge, students also examine important legal and ethical issues such as intellectual property, data protection, and online privacy. By Year 9, the focus shifts to programming fundamentals, algorithms, pseudocode, and deeper understanding of hardware, software, digital systems, and programming languages, with Python.

KS4 GCSE Computer Science

In Years 10 and 11, students dive deeper into computer science with a comprehensive curriculum covering programming, algorithms, data representation, computer systems, databases, cybersecurity, and emerging topics like artificial intelligence. Year 10 builds a strong grasp of core concepts and introduces advanced areas like databases and system architecture. Year 11 is hands-on, with practical programming projects, real-world problem solving, and revision to prepare for the formal written exam. This rigorous program equips students with the skills and knowledge they need for further study or a career in technology.

KS5	A	Level	Computer	Science
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At A-Level, students deepen their understanding of computer science through a rigorous and engaging curriculum designed to prepare them for higher education and careers in tech. They explore advanced topics such as software development, system architecture, algorithms, and data structures in greater detail. Students also study programming paradigms, computational thinking, and problem-solving techniques, with a strong emphasis on developing efficient, maintainable code. Practical programming projects are a key part of the course, allowing students to apply their knowledge and showcase their skills. The course covers crucial themes like cybersecurity, ethical considerations in computing, databases, and modern technologies including artificial intelligence and machine learning. Assessment includes written exams focusing on theory and problem-solving, alongside a substantial programming project that demonstrates the student's ability to design, develop, test, and evaluate software solutions. This comprehensive course equips students with both the theoretical knowledge and practical skills essential for success in computer science degrees or technology-focused careers.

Term	Autumn 1	Te	Autumn 2	Te	Spring 1	Spring 2	Pr	Summer 1	Summer 2
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Year 8	Social Engineering Learn how attackers manipulate people to gain unauthorized access to information or systems. Public Network Attack Understand the risks of using public Wi-Fi and how attackers can exploit these networks. Embedded Systems Explore specialized computer systems built into devices like cars, appliances, and gadgets. Input, Process, Output Study the basic cycle of how computers take input, process data, and produce output.	Test	Computer Components – Software Learn about different types of software and their roles within a computer system. Binary Basics Understand the binary number system and why computers use it. Binary to Decimal Learn how to convert binary numbers into decimal numbers.	Test	Learning the Basics of HTML and Projects This topic teaches students the fundamentals of HTML (Hypertext Markup Language) for creating web pages. Students will learn about basic HTML tags, structure, and elements like headings, paragraphs, links, and images. They will apply this knowledge to create their own simple web projects.	Learning the Basics of HTML and Projects This topic teaches students the fundamentals of HTML (Hypertext Markup Language) for creating web pages. Students will learn about basic HTML tags, structure, and elements like headings, paragraphs, links, and images. They will apply this knowledge to create their own simple web projects.	Practical	Binary to Hex Learn how to convert binary numbers into hexadecimal format, which is a compact way to represent binary data. Images Explore how digital images are created, stored, and displayed using pixels and colour codes. Networking Understand how computers connect and communicate over networks, including basic concepts and types of networks.	Flowcharts Learn how to use flowcharts to visually represent the steps and decisions in a process or algorithm. Ethical, Cultural, and Environmental Issues with AI Explore the challenges AI poses to society, including privacy concerns, cultural impacts, and environmental effects. Technology Evolution Understand how technology has developed over time and how advances shape our world today. EOY

Year 9	Secondary Storage – How They Work Learn about different types of secondary storage devices (like hard drives, SSDs, USB drives) and how they store data long-term.		Logic gates When learning about logic gates, students will learn about the basic building blocks of digital circuits and computer systems. Logic gates are the fundamental elements of digital circuits, used to process and transmit binary signals.		Python This topic introduces students to Python, a beginner-friendly programming language. Students will learn basic concepts such as variables, data types, loops, and conditionals, and how to write simple programmes.	Python This topic introduces students to Python, a beginner-friendly programming language. Students will learn basic concepts such as variables, data types, loops, and conditionals, and how to write simple programmes.		Types of Networks Learn about different network types, such as LAN, WAN, and PAN, and how they connect devices over various distances.	Law Explore key laws related to computing, including data protection, intellectual property, and cybercrime regulations.
	Secondary Storage – Search Project (Cloud Storage) Investigate cloud storage services, how they store data online, and their advantages and challenges.		Binary and hexadecimal Students will learn how to convert decimal numbers (base 10) to binary (base 2) and hexadecimal (base 16) representations. They will learn the concepts and algorithms used to perform these conversions, as well as the advantages and disadvantages of different number systems.					Networking Topologies Explore common network structures like star, bus, and ring, and how devices are connected in each layout.	History of the Computer Learn about the major milestones and pioneers in computer development from early machines to modern technology.
	Artificial Intelligence (AI) Understand the basics of AI, how machines simulate human intelligence, and its applications.							Networking Threats Understand the risks networks face, including hacking, malware, and denial-of-service attacks.	EOY
			Networking students will learn about the technology that enables computers and other devices to communicate					Networking Hardware Discover the devices that make networks work, such as routers, switches, hubs, and access points.	

			with each other over a network.						
Year 10	Students will gain a fundamental understanding of digital logic and computer systems. They will learn about the basic building blocks of digital logic, such as AND, OR, and NOT gates, and how they are used to perform logical operations. Students will also learn about decimal to binary and hexadecimal conversions, which are important for understanding how computers store and process data. Additionally, students will learn about computational thinking, which involves breaking down complex problems into smaller, more manageable steps and using algorithms and logic to find solutions.	Assessment 1	When learning about data representation with images and sound, and compression, students will learn about the different methods and technologies used to store, process, and transmit multimedia data such as images, audio, and video. They will learn about different image and audio file formats, such as JPEG, PNG, and MP3, and how they are used to represent images and sound in a digital format.	Assessment 2	Python programming and ethical, legal, cultural, and environmental impacts, students will gain a foundation in programming concepts and practices. They will learn how to write code in Python, a widely used programming language, and understand the basic syntax and structure of a program. They will also learn about variables, data types, control structures, functions, and more.	Defensive design and the architecture of the CPU, students will gain a deeper understanding of computer systems and how they are designed to operate securely. They will learn about defensive design techniques and strategies, including input validation, error handling, and security testing, to create software that is resilient against security threats.	Assessment 3	When learning about secondary storage and utility software, students will gain an understanding of the different types of storage used in computing systems. They will learn about secondary storage devices, including hard disk drives, solid-state drives, and cloud storage, and how they are used to store and retrieve data. Additionally, students will learn about utility software, including tools and applications used to manage, maintain, and optimize computer systems. This includes understanding the different types of utility software, such as disk defragmenters, backup software, and anti-virus software, and how they can be used to increase efficiency, ensure data security, and improve overall system performance. By the end of the unit, students will have a solid understanding of secondary storage and utility software, and how they are used to manage and maintain computer systems.	

Year 11	Students will gain an in-depth understanding of the central processing unit (CPU) and how it functions within a computer system. They will learn about the different components of the CPU, including the control unit, arithmetic logic unit, and cache, and how they work together to execute instructions and perform tasks. Additionally, students will learn about CPU performance and how it can be measured and optimized. This includes understanding the different factors that influence CPU performance, such as clock speed, number of cores, and memory, and how they can be used to improve the overall performance of a computer system. By the end of the unit, students will have a solid understanding of the architecture of the CPU and CPU performance, and how they impact the performance and efficiency of a computer system.	Mock Exam 2	Students will understand of the different types of network configurations and how they are used to connect devices. They will learn about different network topologies, including bus, star, and mesh networks, and the advantages and disadvantages of each. Additionally, students will learn about the various security threats that can impact computer systems, including viruses, malware, and hacking, and how to protect against these threats. This includes understanding the different types of security measures, such as firewalls, antivirus software, and encryption, and how they can be used to secure computer systems and networks. By the end of the unit, students will have a solid understanding of networking topology and the various security threats to computer systems, and how to protect against them.	Mock Exam 3	When learning about different searching and sorting algorithms, students will gain an understanding of various methods used to search and sort data. They will learn about different types of searching algorithms, such as linear search, binary search, and hash table, and how they can be used to find specific data within a large dataset. Additionally, students will learn about different sorting algorithms, including bubble sort, insertion sort, and quick sort, and how they can be used to efficiently sort data. This includes understanding the different trade-offs, such as time and space complexity, of each algorithm and when to use each one based on the specific	Revision in preparation for end of year exams.
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Year 12	System Architecture Understanding the internal structure of the CPU, including the fetch-decode-execute cycle, registers, and how the CPU processes instructions. Memory and Storage Study different types of memory (RAM, ROM, cache) and storage devices, their characteristics, and their roles in computing systems. Data Representation Learn how data is represented in binary, including number systems (binary, hexadecimal), character encoding (ASCII, Unicode), and data types. Networks Explore network types, topologies, protocols, and the hardware involved in data transmission and communication.	Mock Exam 2	System Security Understand threats to computer systems, methods of protection, and ethical, legal, and environmental impacts of computing. Software Study different types of software, including operating systems, utility programs, and application software. System Performance Investigate factors affecting system performance and how to improve efficiency. Legal, Ethical, and Environmental Issues Examine the laws, ethics, and environmental considerations relevant to computing technologies.	Mock Exam 3	Algorithms Study how to design, analyze, and evaluate algorithms for solving problems efficiently, including searching and sorting algorithms. Programming Techniques Learn programming concepts such as iteration, selection, recursion, and data structures like arrays and records. Algorithm Design and Problem Solving Develop skills in designing algorithms using pseudocode and flowcharts to solve complex problems. Data Structures Understand different data structures including lists, stacks, queues, and trees, and their applications. Practical Programming Project Complete a substantial programming project to demonstrate practical skills in designing, implementing, testing, and evaluating a software solution.	