

Curriculum Vision – *Computer Science*

What is the purpose of the curriculum?

- To build a strong foundation in digital skills, computational thinking and the understanding of technology in the world around them.

Why is *Computer Science* an important subject?

- Computer Science is an important subject because it helps students understand, use, and shape the technology that is part of everyday life
- It aims to equip students with the knowledge, skills and mindset to understand, use, understand and create technology confidently, safely and creatively.
- It builds problem solving skills, ensures students are kept safe online, encourages creativity and prepares students for the future.



Types of Knowledge – *Computer Science*

Knowledge of contexts

e.g. problem-space and the kinds of tasks computing is able to and is allowed to perform; knowledge of ethics, security, and safety, etc.

Knowledge of the composition and operations of computers

e.g. memory, processing, storage, input and output methods, hardware, software, and their interaction via machine code etc.

Knowledge of principles of computational thinking

e.g. algorithms, data structures, logics and semantics, heuristics, control systems, etc.

Knowledge of specific programming languages

e.g. knowledge of Scratch, Python: commands, syntax and structures

Habits of working in computing

e.g. decomposition, precision, debugging, paired programming, etc.

Ability to use ICT

e.g. files, emails, word processing, presentation and spreadsheet software etc.

Ability to program

e.g. ability to program effective responses to challenges

Credit: Ruth Ashbee. Curriculum. Theory, Culture and Subject Specialisms.



Curriculum Themes Overview – *Computer Science*

Big idea – helping students understand how computers work and how to use them to solve problems and understand the digital world.

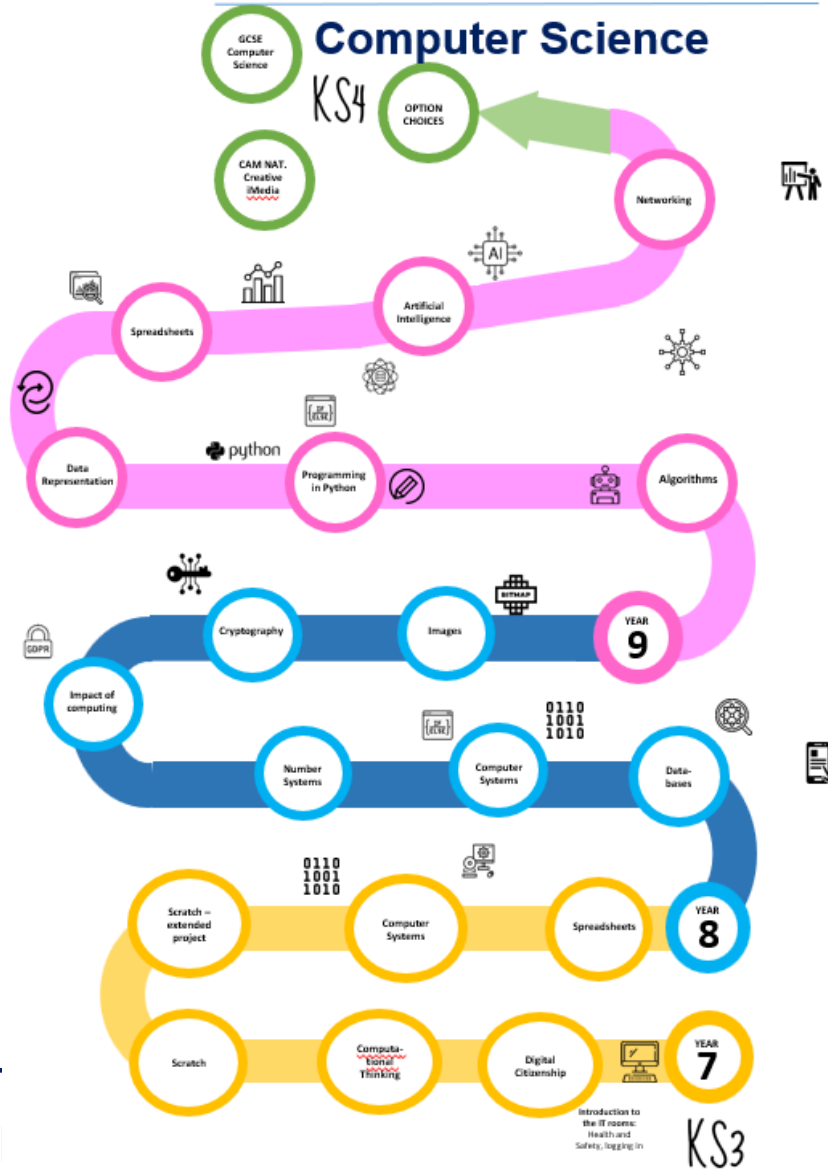
Theme/Big Idea/...	Description
<i>Theme 1 – Computational Thinking</i>	Help students to think logically and solve problems systematically.
<i>Theme 2 – Build Programming Skills</i>	Students learn how to write, test and debug programs.
<i>Theme 3 – Understand How Computers Work</i>	The underlying principals of hardware and software components, binary/data representation and networks.
<i>Theme 4 - Issues</i>	Develop responsible and ethical users that are aware of ethical, legal and environmental issues.
<i>Theme 5 - Software</i>	Apply concepts, solve problems and develop practical skills.

Curriculum Five Year Journey – *Computer Science*



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Curriculum Themes Map – Computer Science

Theme/Big Idea/...	Description	Year 7	Year 8	Year 9	Year 10	Year 11
<i>Theme 1 – Computational Thinking</i>	Core problem-solving skills used in computing. Encouraging students to think systematically and logically to solve problems. It includes; decomposition, pattern recognition, abstraction, algorithms and logical reasoning.	T2 – Computational Thinking	T5 – Cryptography	T1 – Algorithms	2-Algorithms 6-Boolean Logic 8-Representation of Numbers 11-Searching & Sorting algorithms	5 – Databases & SQL
<i>Theme 2 – Build Programming Skills</i>	Focuses on developing students’ ability to write, understand, and improve programs. It builds on computational thinking by putting ideas into practice using code. It includes; programming fundamentals, sequencing, selection, iteration, variable, input/output and debugging.	T4/5 -Scratch	TX – Python (2027/8)	T2 – Python	1-Sequence 3-Selection 5-Iteration 7-Subroutines 9-Strings & Lists	1 – Dictionaries & data files 3-Python Project 7-HTML Project
<i>Theme 3 – Understand How Computers Work</i>	The theory behind computing systems - helping students understand what is happening inside a computer, not just how to use or program one. It includes; computer systems/hardware, fetch-decode-execute, binary and data representation, Boolean logic, networks and data storage	T3 – Computer Systems	T2 – Computer Systems T3 – Number Systems	T3 – Data Representation T6 – Networking	4 – Computer Systems 8-Representation of number 10 – Representation of text, images, sound 12 – Data Compression	2 – Network fundamentals 4 – The internet & web technologies
<i>Theme 4 - Issues</i>	Explores the ethical, legal, cultural, and environmental impacts of technology. This strand helps students understand how computing affects individuals and society—not just how it works. It includes; safety, privacy, cyber security, ethical and legal issues and reliability.	T1 - Digital Citizenship	T4 – Impacts of Computing	T5 – AI	13 – Data Science	6 - Cyber threats & security
<i>Theme 5 - Software</i>	Focuses on understanding different types of software, how they are used, and how they are designed to meet users’ needs. It includes; spreadsheets, presentation software, databases and digital graphics software.	T6 – Spreadsheets T1 – Digital Citizenship (PowerPoint)	T1 – Databases T6 – Images (Photoshop)	T4 – Spreadsheets		

Careers opportunities – *Computer Science*

Year	Specific opportunities for teaching about carers linked to Computer Science
7	- Term 2 - Computer systems. IT and technical support, computer engineering, cyber security, software development, robotics - Term 4 – Scratch. Games developer, Software developer, Animator, Web Developer, Programmer, Cyber Security expert, AI Developer, Data Analyst - Term 6 – Spreadsheets. Data analyst, Accountant, Entrepreneur/Business owner, Office Administrator, Human Resources, Scientist/Researcher
8	- Term 2 - Computer systems. IT and technical support, computer engineering, cyber security, software development, robotics - Term 5 – Cryptography. Cybersecurity, Intelligence, software, finance, business - Term 6 – Images. Creative and design, media and entertainment, science, business and marketing
9	- Term 3 – Python. Software development, Data and AI, Cyber security, robotics, - Term 4 – Spreadsheets. Data analyst, Accountant, Entrepreneur/Business owner, Office Administrator, Human Resources, Scientist/Researcher - Term 5 – AI. AI, Machine learning engineer, software and technology, cybersecurity, engineering, robotics, healthcare/science, business. - Term 6 – Networking. Network and IT, Cybersecurity, Cloud and modern technology, telecommunications, software
10	- Unit 3 – Computer Systems – Understand what system engineers and IT support technicians do - Unit 8 & Unit 10 – Data representation – Understand what data analysts and data scientists do - Unit 13 – Data Science – Understand what AI Engineers do
11	- Unit 2 – Network fundamentals – Understand what network engineers do - Unit 6 – Cyber Threats – Understand what cyber security analysts do - Unit 7 – HTML Project – Understand what Software Developers do