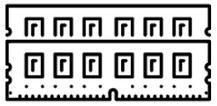
Key Stage 3 Curriculum Journey: Computer Science

The curriculum in Computer Science will introduce the key fundamental topics to give pupils a holistic view of the power of computing, and how to utilise technology effectively and safely.

YEAR 7 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	Staying Safe when using Technology	 Computer Systems	Representations	Computational Thinking	Physical Computing	Using Media – gaining support for a cause
Key Knowledge, Skills & Understanding	• 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 on the internet or other technologies. • Recognise acceptable and unacceptable behaviour • Recognise fake profiles • Aware of online abuse including grooming	• Explain the difference between a general-purpose computing system and a purpose-built device. • Describe the function of the hardware components used in computing systems • Describe how the hardware components used in computing systems work together in order to execute programs • Understand the use of logical gates in circuits	• Understand what binary is • Understand how to count using 0 & 1 only • Understand how to convert binary to denary, denary to binary • Understand how to complete binary addition • Understand how to convert hexadecimal to binary and binary to hexadecimal • Understand how binary numbers represent images • Understand how binary numbers represent sound	• Use abstraction to reduce complexity of problems • Decompose problems to make them easier to solve • Write algorithms for simple everyday problems using flowcharts, and pseudo code	• Use sequence to order instructions • Use and change the value of variables to store values • Use selection to check conditions • Use iteration to repeat instructions • Use and change the value of variables to store values • Use sub programs to improve efficiency of code • Apply skills to set problems	• Apply the key features of a word processor to format a document • Demonstrate an understanding of licensing issues involving online content by applying appropriate Creative Commons licences • Apply techniques to identify whether or not a source is credible • Construct a blog using appropriate software suitable for the audience • Create content for a blog based on credible sources
KS3 National Curriculum Links	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems	Understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming	Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
MAPs	1 x MAP	1 x MAP	1 x MAP	1 x MAP	1 x MAP	1 x MAP

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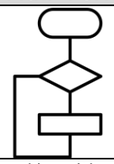
YEAR 8 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	Staying Safe when using Technology	Networking	 Algorithms	Programming in Python v1	Modelling Data	Modelling Data
Key Knowledge, Skills & Understanding	• Know actions to take to stay safe online, and the online challenges that they may face • Identify material that incites students to act in a certain way e.g. glamorising/gangs • Identify ways to keep yourself safe when live streaming/potential threats of live streaming	• Define what a computer network is and explain how data is transmitted between computers across networks • List examples of the hardware necessary for connecting devices to networks • Compare wired to wireless connections • Explain the difference between the internet, its services, and the World Wide Web	• Use of algorithms to solve problems. • Write algorithms to solve common problems. • Describe different searching and sorting algorithms • Compare different searching and sorting algorithms	• Create simple programs containing inputs and outputs • Create simple programs using selection • Use variables to store values • Know and use different data types to store data • Create simple programs using iteration to repeat code	• Describe the use of spreadsheets • Use Microsoft Excel to create a basic spreadsheet to model data • Format a spreadsheet • Use and create simple and complex formula and functions	• Produce outputs to visualise and analyse data • Independently create a spreadsheet solution to a problem
KS3 National Curriculum Links	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems	Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching] Use logical reasoning to compare the utility of alternative algorithms for the same problem	Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users
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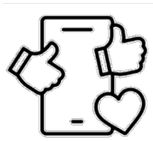
YEAR 9 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	 Staying Safe when using Technology	Impacts of technology, and new technologies	Cyber security	Algorithms	Programming in Python v2	Representations – going audio visual
Key Knowledge, Skills & Understanding	• Explain the need and importance of age restrictions on the internet • Identify online scams and common fraud techniques • Understand that internet content can be persuasive and explain common manipulation techniques	• Explain how certain technologies can be considered unethical • Explain how technology has changed/can affect different cultures • Explain how technology can harm the environment and strategies to reduce this • Explain the use of AI and other new technologies and their impact	• Describe different social engineering methods • Define hacking and brute force attacks • List the common malware threats • Examine how different types of malware cause problems for computer systems • Explain how networks can be protected from common security threats	• Producing simple algorithms for everyday problems • Produce algorithms for simple programming problems • Explain the use and compare the efficiency of different sorting, and searching algorithms	• Use of sub programs to improve efficiency of programs • Use of file handling to store data • Program independently to solve larger problems	• Describe how digital images are composed of individual elements • Perform basic image editing tasks using appropriate software and combine them in order to solve more complex problems requiring image manipulation • Describe how sounds are represented as sequences of bits • Perform basic sound editing tasks using appropriate software and combine them in order to solve more complex problems requiring sound manipulation
KS3 National Curriculum Links	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns	Evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy	Understand several key algorithms that reflect computational thinking Understand several key algorithms that reflect computational thinking	Use a textual programming language, to solve a variety of computational problems Make appropriate use of data structures Design and develop modular programs that use procedures or functions	Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals,

MAPs	1 x MAP	1 x MAP	1 x MAP	1 x MAP	1 x MAP	1 x MAP