KS 4 Computer Science Curriculum 2022-2023

Curriculum Intent

The IT curriculum will equip all pupils with the knowledge needed to use computational thinking and creativity to understand the digital world around them.

Curriculum Implementation

Year	Start When	No of lessons	Topic	Summary	Big Questions	Assessment for learning	Cultural Capitol Opportunities
10	Autumn	6	Computational Thinking	Links to programming in Year 8/9	Understand the computational constructs Understand programming syntax Understand the facilities of languages and translators Understand how to break problems down	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Links to other uses of problem solving including real world problems
10	Autumn	10	Programming Techniques	Computational thinking methods and constructs	Understand syntax for logical programming Understand syntax for iteration Understand how nesting can be used	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Bebras challenge How tech works
10	Autumn	12	Programming Techniques	Previous programming techniques and Computational thinking	Understand different types of error Understand how to make code more maintainable Understanding string manipulation techniques	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Links to real world programming How tech works Solving real world problems

10	Spring	12	Programming Techniques	Previous programming techniques and Computational thinking	Understand different data structures and why they are needed Understand how to access files and databases	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Links to real world programming How tech works Solving real world problems
10	Spring	4	Programming Techniques	Previous programming techniques and Computational thinking	Understand defensive design considerations Understand different types of error Understand how to test solutions thoroughly	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Links to real world programming How tech works Solving real world problems
10	Spring	8	Programming Techniques	Previous programming techniques and Computational thinking	Using skills learnt to solve a programming project	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Links to real world programming How tech works Solving real world problems
10	Summer	6	Boolean Logic	Boolean operators	Students will study logic circuits and how data flows through them following the laws of Boolean logic.	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Possible Visit www.georgeboole.comVisit Computing history centre in Cambridge or the National museum of computing at Bletchleypark
10	Summer	6	Standard algorithms	Programming techniques	Students will study the standard search and sort algorithms that are used widely in programs. This	Cold Calling AFL by Questioning	Play a card game (sorting the cards in your hand)

					will include how to trace them and write them.	One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	
10	Summer	2	Translators and the IDE	Programming techniques	Students will recap how an IDE can help write and debug programs and they will also learn about different types of programming languages.	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Possible - Visit Computing history centre in Cambridge Watch/ read Hidden figures
10	Summer	5	Systems architecture	Programming techniques	Students will learn about the CPU and how it is used with other components of a computer.	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Possible - Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park Watch Tron
10	Summer	10	Memory and storage	Systems architecture Programs Boolean logic Basic numeracy skills (Maths)	Students will learn how data is stored by computers. This will include the devices data is stored on and how each type of data can be represented in binary.	Cold Calling AFL by Questioning One 50-mark, 1 hour assessment each half term focusing on all topics up to this point	Watch The Emoji movie, The Martian, Tron, Calculating Ada Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park
11	Autumn	4	Search and sort algorithms revision	Strong links to writing and	Students will study how to read and write the standard search and sort algorithms	One 60 mark, 1 hour assessment focusing on all topics up to this	Take part in the Cyber Discovery challenge:

				understanding algorithms		point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	https://joincyberdiscovery.com/Learn a new programming language
11	Autumn	4	Algorithms and programming revision	Programming techniques Algorithms Boolean logic	Students will recap how to read and write algorithms. Physical computing will be used to help students engage with the tasks	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Take part in the Cyber Discovery challenge: https://joincyberdiscovery.com/Learn a new programming language Exploring the Internet of Things

11	Autumn	4	Networks and security revision	Systems architecture Memory and storage Programs	Students will study how networks are created and their uses. They will also learn how to protect computer systems from attack.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Watch Wreck it Ralph: Breaks the internet, The imitation game Take part in the Cyber Discovery challenge: https://joincyberdiscovery.com/Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park
11	Autumn	4	Systems software revision	System architecture Memory and storage Networks and security	Students will learn about the software needed to manage and run a computer.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Improve your computer's performance by running a disk clean up and defragmentation.
11	Autumn	5	Ethical, Legal, Cultural and Environmental (ELCE) impacts revision	Networks and security	Students will learn about the positive and negative impacts of technology as well as the laws that govern its use.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2	Watch/ read Ready Player One, Watch The Circle, The Social network Read articles from BBC technology: Technology -BBC News

						One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	
11	Autumn	2	Systems architecture revision	Systems architecture Memory and storage Programs	Students will recap the CPU and how it is used with other components of a computer.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park Watch Tron
11	Spring	5	Memory and storage revision	Systems architecture Memory and storage Programs Boolean logic Basic numeracy skills (Maths)	Students will recap how data is stored by computers. This will include the devices data is stored on and how each type of data can be represented in binary.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Watch The Emoji movie, The Martian, Tron, Calculating Ada Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park

11	Spring	2	Boolean logic revision	Previous learning on Boolean logic and Boolean operators	Students will recap the rules of logic gates and how to apply them in truth tables	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Creating logic circuits on logic.ly/demo
11	Spring	3	Networks and security revision	Systems architecture Memory and storage Programs	Students will recap how networks are created and their uses. They will also learn how to protect computer systems from attack.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Watch Wreck it Ralph: Breaks the internet, The imitation game Take part in the Cyber Discovery challenge Visit Computing history centre in Cambridge or the National museum of computing at Bletchley park
11	Spring	4	Algorithms and programming revision	Programming techniques Algorithms Boolean logic	Students will recap how networks are created and their uses. They will also learn how to protect computer systems from attack.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2	Learn a new programming language Take part in Discovery Challenge

						One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	
11	Spring	3	Ethical, Legal, Cultural and Environmental (ELCE) impacts revision	Networks and security ELCE impacts	Students will recap the positive and negative impacts of technology as well as the laws that govern its use.	One 60 mark, 1 hour assessment focusing on all topics up to this point including year 9 and 10 split into component 1 and component 2 One full mock consisting of one paper on Computer systems and a second paper on Algorithms and programming	Watch/ read Ready Player One, Watch The Circle, The Social network Read articles from BBC technology: Technology -BBC News
11	Summer	9	General Revision	All Topics	Students will recap all previous topics	Component 1 final exam Component 2 final exam	