

Computer Science Key Stage 3 Curriculum Map

Year 7

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Unit title: Using Google Apps – Climate Change Project</p>	<p>Unit title: Using Google Apps – Climate Change Project</p>	<p>Unit title: Writing algorithms to model real-life problems using Flowol and VEXcode VR</p>	<p>Unit title: Writing algorithms to model real-life problems using Flowol and VEXcode VR</p>	<p>Unit title: Introduction to programming in Python and Python Turtle</p>	<p>Unit title: Introduction to programming in Python and Python Turtle</p>
<p>Description: Students undertake a project on researching and presenting information at a climate change expo at the Excel Centre in London. As part of that involves using different Google apps to investigate and analyse the effects of climate change. They then create a website to promote their presentation at the expo. Finally, they plan and present a presentation to the</p>	<p>Description: Students undertake a project on researching and presenting information at a climate change expo at the Excel Centre in London. As part of that involves using different Google apps to investigate and analyse the effects of climate change. They then create a website to promote their presentation at the expo. Finally, they plan and present a presentation to the</p>	<p>Description: Students will use Flowol to create flow charts to model real life scenarios such as modelling traffic lights at a crossing and controlling a fair ground ride. They will also use blocks in VEXcode VR to control a robot to perform various tasks.</p>	<p>Description: Students will use Flowol to create flow charts to model real life scenarios such as modelling traffic lights at a crossing and controlling a fair ground ride. They will also use blocks in VEXcode VR to control a robot to perform various tasks.</p>	<p>Description: Students will learn basic coding in Python including drawing in Python Turtle</p>	<p>Description: Students will learn basic coding in Python including drawing in Python Turtle</p>

<p>The following concepts covered in the Computer Science KS2 National Curriculum:</p> <ul style="list-style-type: none"> ● Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content ● Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and 	<p>The following concepts covered in the Computer Science KS2 National Curriculum:</p> <ul style="list-style-type: none"> ● Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content ● Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and 	<p>The following concepts covered in the Computer Science KS2 National Curriculum:</p> <ul style="list-style-type: none"> ● Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts ● Use sequence, selection, and repetition in programs; 	<p>The following concepts covered in the Computer Science KS2 National Curriculum:</p> <ul style="list-style-type: none"> ● Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts ● Use sequence, selection, and repetition in programs; 	<p>The following concepts covered in the Computer Science KS2 National Curriculum and the previous unit on writing algorithms:</p> <ul style="list-style-type: none"> ● Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts ● Use sequence, selection, and repetition in programs; work with variables and various forms 	<p>The following concepts covered in the Computer Science KS2 National Curriculum and the previous unit on writing algorithms:</p> <ul style="list-style-type: none"> ● Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts ● Use sequence, selection, and repetition in programs; work with variables and various forms
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<p>content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p>content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p>work with variables and various forms of input and output</p> <ul style="list-style-type: none"> • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 	<p>work with variables and various forms of input and output</p> <ul style="list-style-type: none"> • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 	<p>of input and output</p> <ul style="list-style-type: none"> • Use logical reasoning to detect and correct errors in algorithms and programs 	<p>of input and output</p> <ul style="list-style-type: none"> • Use logical reasoning to detect and correct errors in algorithms and programs
<p>Introduces:</p> <ul style="list-style-type: none"> • Presenting data and information • Meeting the needs of a user 	<p>Introduces:</p> <ul style="list-style-type: none"> • Presenting data and information • Meeting the needs of a user 	<p>Introduces:</p> <ul style="list-style-type: none"> • The concept of abstraction • Using algorithms to model real-world behaviour • Evaluating the 	<p>Introduces:</p> <ul style="list-style-type: none"> • The concept of abstraction • Using algorithms to model real-world behaviour • Evaluating the 	<p>Introduces:</p> <ul style="list-style-type: none"> • Programming in a textual based language (Python) 	<p>Introduces:</p> <ul style="list-style-type: none"> • Programming in a textual based language (Python)

		effectiveness of students own algorithms	effectiveness of students own algorithms		
<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> 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 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> 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 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop

<ul style="list-style-type: none"> • Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthines s, design and usability 	<ul style="list-style-type: none"> • Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthines s, design and usability 			<p>modular programs that use procedures or functions</p>	<p>modular programs that use procedures or functions</p>
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Year 8

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Unit title:	Unit title:	Unit title:	Unit title:	Unit title:	Unit title:

<ul style="list-style-type: none"> ● Presenting data and information ● Meeting the needs of a user 	<ul style="list-style-type: none"> ● Presenting data and information ● Meeting the needs of a user 	<ul style="list-style-type: none"> ● Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration 	<ul style="list-style-type: none"> ● Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration 	<ul style="list-style-type: none"> ● Python unit covered in Year 7 	<ul style="list-style-type: none"> ● Python unit covered in Year 7
<p>Introduces:</p> <ul style="list-style-type: none"> ● Use of text based scripting via HTML and CSS 	<p>Introduces:</p> <ul style="list-style-type: none"> ● Use of text based scripting via HTML and CSS 	<p>Introduces:</p> <ul style="list-style-type: none"> ● Computer hardware components 	<p>Introduces:</p> <ul style="list-style-type: none"> ● Computer hardware components 	<p>Introduces:</p> <ul style="list-style-type: none"> ● Use of more advanced data structures 	<p>Introduces:</p> <ul style="list-style-type: none"> ● Use of more advanced data structures

		<ul style="list-style-type: none"> • Functions of the processor 	<ul style="list-style-type: none"> • Functions of the processor 	<ul style="list-style-type: none"> • Use of functions in Python 	<ul style="list-style-type: none"> • Use of functions in Python
<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> • Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems • Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> • Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems • Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability 	<p>Link to National Curriculum KS3 programme of study:</p> <p>Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</p> <p>Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting</p>	<p>Link to National Curriculum KS3 programme of study:</p> <p>Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems</p> <p>Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including</p>	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> • 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 2 or more programming languages, at 	<p>Link to National Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> • 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 2 or more programming languages, at

		and analysing data and meeting the needs of known users Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability	collecting and analysing data and meeting the needs of known users Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability	least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions	least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions
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Year 9

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<p>Unit Name: Data Representation</p>	<p>Unit Name: Data Representation</p>	<p>Unit Name: Boolean Logic</p>	<p>Unit Name: Boolean Logic</p>	<p>Unit Name: Programming Key Algorithms</p>	<p>Unit Name: Programming Key Algorithms Programming Key Algorithms</p>
<p>Description: Students will learn how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] Students will learn how instructions are stored and executed within a computer system; Students will also learn how data of various</p>	<p>Description: Students will learn how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion</p>	<p>Description: Students will learn how to use simple Boolean logic (AND, OR and NOT) to create logic circuits and some of its uses in circuits and programming</p>	<p>Description: Students will learn how to use simple Boolean logic (AND, OR and NOT) to create logic circuits and some of its uses in circuits and programming</p>	<p>Description: Students will look at and compare common searching (linear search and binary search) and sorting (bubble and insertion) algorithms. They will look at how these algorithms work and how they can be coded in Python.</p>	<p>Description: Students will look at and compare common searching (linear search and binary search) and sorting (bubble and insertion) algorithms. They will look</p>

types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits	between binary and decimal] Students will learn how instructions are stored and executed within a computer system; Students will also learn how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits				at how these algorithms work and how they can be coded in Python.
Assessment: <ul style="list-style-type: none"> • Mid unit test on binary, denary and hexadecimal • End of unit test covering number conversions, representation of characters, images, 	Assessment: <p>Mid unit test on binary, denary and hexadecimal</p> <p>End of unit test covering number conversions,</p>	Assessment: <p>Mid unit test on creating a circuit for an alarm system in LogicSim</p>	Assessment: <p>Mid unit test on creating a circuit for an alarm system in LogicSim</p>	Assessment: <ul style="list-style-type: none"> • Create a presentation on the different searching and sorting algorithms (linear and binary search, bubble and insertion sort) • Create Python programs to 	Assessment: <p>Create a presentation on the different searching and sorting algorithms (linear and</p>

sound and the use of compression	representation of characters, images, sound and the use of compression			demonstrate the use of these searches and sorts.	binary search, bubble and insertion sort) <ul style="list-style-type: none"> • Create Python programs to demonstrate the use of these searches and sorts.
Builds upon:	Builds upon:	Builds upon: Data Representation (covered in previous term)	Builds upon: Data Representation (covered in previous term)	Builds upon: Python units covered in Year 7 and Year 8. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Build upon: Python units covered in Year 7 and Year 8.
Introduces:	Introduces:	Introduces:	Introduces:	Introduces:	Introduces:
Link to National Curriculum KS3 programme of study:	Link to National Curriculum KS3	Link to National Curriculum KS3	Link to National Curriculum KS3	Link to National Curriculum KS3 programme of study:	Link to National

<ul style="list-style-type: none"> Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] 	<p>programme of study:</p> <ul style="list-style-type: none"> Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to 	<p>programme of study:</p> <ul style="list-style-type: none"> understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for 	<p>programme of study:</p> <ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve 	<ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other 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 Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to 	<p>Curriculum KS3 programme of study:</p> <ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with
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	<p>carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]</p>	<p>example, binary addition, and conversion between binary and decimal]</p> <ul style="list-style-type: none"> • 	<p>challenging goals, including collecting and analysing data and meeting the needs of known users</p> <ul style="list-style-type: none"> • Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability 	<p>trustworthiness, design and usability</p>	<p>other systems</p> <ul style="list-style-type: none"> • Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to
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					<p>achieve challenging goals, including collecting and analysing data and meeting the needs of known users</p> <ul style="list-style-type: none">● Create, reuse, revise and repurpose digital artefacts for a
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					given audience, with attention to trustworthiness, design and usability
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