Computer Science Key Stage 3 Curriculum Map

Year 7

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

rest of the class on	rest of the class on				
their view on climate	their view on climate				
change.	change.				
Assessment:	Assessment:	Assessment:	Assessment:	Assessment:	Assessment:
Students are assessed	Students are assessed	End of unit	End of unit	End of unit	End of unit
on the following	on the following	assessment activity	assessment activity	assessment	assessment
pieces of work that	pieces of work that	consisting of tasks in	consisting of tasks in	consisting of a series	consisting of a series
they produce as part	they produce as part	both Flowol and	both Flowol and	of tasks involving	of tasks involving
of the project:	of the project:	VEXcode VR themed	VEXcode VR themed	Python coding and	Python coding and
Climate	Climate	on the 'automatic	on the 'automatic	the use of Python	the use of Python
Change plan	Change plan	home'	home'	Turtle	Turtle
(Google Docs)	(Google Docs)				
 Climate 	Climate				
Change	Change				
questionnaire	questionnaire				
(Google Forms)	(Google Forms)				
 Analysis of 	 Analysis of 				
climate change	climate change				
data (Google	data (Google				
Sheets)	Sheets)				
Website to	Website to				
promote the	promote the				
expo (Google	expo (Google				
Sites)	Sites)				
• Expo	• Expo				
presentation	presentation				
(Google Slides)	(Google Slides)				
Builds upon:	Builds upon:	Builds upon:	Builds upon:	Builds upon:	Builds upon:

The following concepts covered in the Computer Science KS2 National Curriculum:

- 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

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 - 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

The following concepts covered in the Computer Science KS2 National Curriculum:

• 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;

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- Use sequence, selection, and repetition in

programs;

smaller parts

The following concepts covered in the Computer Science KS2 National Curriculum and the previous unit on writing algorithms:

- Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts
- sequence,
 selection,
 and
 repetition in
 programs;
 work with
 variables and
 various forms

Use

The following concepts covered in the Computer Science KS2 National Curriculum and the previous unit on writing algorithms:

- 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

		_ 1 91	_ 1 ••1	- (
content that	content that	work with	work with	of input and	of input and
accomplish	accomplish	variables and	variables and	output	output
given goals,	given goals,	various forms	various forms	Use logical	Use logical
including	including	of input and	of input and	reasoning to	reasoning to
collecting,	collecting,	output	output	detect and	detect and
analysing,	analysing,	 Use logical 	 Use logical 	correct errors	correct errors
evaluating and	evaluating and	reasoning to	reasoning to	in algorithms	in algorithms
presenting	presenting	explain how	explain how	and	and
data and	data and	some simple	some simple	programs	programs
information	information	algorithms	algorithms		
		work and to	work and to		
		detect and	detect and		
		correct errors	correct errors		
		in algorithms	in algorithms		
		and	and		
		programs	programs		
		programs	programs		
Introduces:	Introduces:	Introduces:	Introduces:	Introduces:	Introduces:
 Presenting 	 Presenting 	 The concept 	 The concept 	 Programming 	 Programming
data and	data and	of	of	in a textual	in a textual
information	information	abstraction	abstraction	based	based
 Meeting the 	 Meeting the 	Using	Using	language	language
1	I VICCIIIS LIC	l A Collig			
needs of a user	needs of a user	ı			(Python)
needs of a user	1	algorithms	algorithms	(Python)	(Python)
needs of a user	1	algorithms to model	algorithms to model		(Python)
needs of a user	1	algorithms to model real-world	algorithms to model real-world		(Python)
needs of a user	1	algorithms to model real-world behaviour	algorithms to model		(Python)
needs of a user	1	algorithms to model real-world	algorithms to model real-world		(Python)

		effectiveness	effectiveness		
		of students	of students		
		own	own		
		algorithms	algorithms		
Link to National	Link to National	Link to National	Link to National	Link to National	Link to National
Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3
programme of study:	programme of study:	programme of	programme of	programme of	programme of
 Undertake 	 Undertake 	study:	study:	study:	study:
creative	creative	 Design, use 	Design, use	Use 2 or	Use 2 or
projects that	projects that	and evaluate	and evaluate	more	more
involve	involve	computation	computation	programming	programming
selecting,	selecting,	al	al	languages, at	languages, at
using, and	using, and	abstractions	abstractions	least one of	least one of
combining	combining	that model	that model	which is	which is
multiple	multiple	the state and	the state and	textual, to	textual, to
applications,	applications,	behaviour of	behaviour of	solve a	solve a
preferably	preferably	real-world	real-world	variety of	variety of
across a range	across a range	problems	problems	computation	computation
of devices, to	of devices, to	and physical	and physical	al problems;	al problems;
achieve	achieve	systems	systems	make	make
challenging	challenging			appropriate	appropriate
goals, including	goals, including			use of data	use of data
collecting and	collecting and			structures	structures
analysing data	analysing data			[for example,	[for example,
and meeting	and meeting			lists, tables	lists, tables
the needs of	the needs of			or arrays];	or arrays];
known users	known users			design and	design and
				develop	develop

			modular	modular
revise and			programs	programs
repurpose			that use	that use
digital			procedures	procedures
artefacts for a			or functions	or functions
given				
audience, with				
attention to				
trustworthines				
s, design and				
usability				
	repurpose digital artefacts for a given audience, with attention to trustworthines s, design and	repurpose digital artefacts for a given audience, with attention to trustworthines s, design and	repurpose digital artefacts for a given audience, with attention to trustworthines s, design and	repurpose digital artefacts for a given audience, with attention to trustworthines s, design and

Year 8

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

HTML & CSS	HTML & CSS	Hardware and	Hardware and	Advanced Python	Advanced Python
		Networks	Networks	Programming	Programming
Description:	Description:	Description:	Description:	Description:	Description:
Students will learn how	Students will learn how	Students learn	Students learn	Students use Python	Students use Python
to create web pages	to create web pages	about the	about the	to solve a variety of	to solve a variety of
using Hyper Text	using Hyper Text	components that	components that	computational	computational
Mark-up Language	Mark-up Language	make up a modern	make up a modern	problems making use	problems making use
(HTML) and Cascading	(HTML) and Cascading	PC system and	PC system and	of sequence,	of sequence,
Style Sheets (CSS) using	Style Sheets (CSS) using	how they work.	how they work.	selection and	selection and
Hyper Builder	Hyper Builder	Students will also	Students will also	iteration	iteration
		learn the benefits	learn the benefits		
		of connecting	of connecting		
		computer systems	computer systems		
		together in	together in		
		networks and the	networks and the		
		hardware that is	hardware that is		
		required to do this.	required to do		
			this.		
Assessment:	Assessment:	Assessment:	Assessment:	Assessment:	Assessment:
Students will be	Students will be	Students will	Students will	Mid-Point	Mid-Point
assessed on a website	assessed on a website	produce a	produce a	assessment:	assessment:
they have created for a	they have created for a	presentation that	presentation that	Create a quiz	Create a quiz
local retailer using	local retailer using	they will deliver to	they will deliver to	in Python	in Python
Hyper Builder and	Hyper Builder and	the class	the class		
other suitable tools	other suitable tools	recommending PC	recommending PC		
		and network	and network		
		hardware for a	hardware for a		
		gaming centre	gaming centre		
Builds upon:	Builds upon:	Builds upon:	Builds upon:	Builds upon:	Build upon:

 Presenting data and information Meeting the needs of a user 	 Presenting data and information Meeting the needs of a user 	• Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportuniti es they offer for communica tion and collaborati on	• Understan d computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportuniti es they offer for communic ation and collaborati on	Python unit covered in Year 7	Python unit covered in Year 7
Introduces: • Use of text	Introduces: • Use of text	Introduces: • Computer	Introduces: • Computer	Introduces: • Use of more	Introduces: ■ Use of more
based scripting	based scripting	Computer hardware	Computer hardware	advanced data	advanced data
via HTML and	via HTML and	component	component	structures	structures
CSS	CSS	S	S		

		Functions of the processor	Functions of the processor	Use of functions in Python	Use of functions in Python
Link to National	Link to National	Link to National	Link to National	Link to National	Link to National
Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3	Curriculum KS3
programme of study:	programme of study:	programme of	programme of	programme of study:	programme of study:
Use 2 or more	 Use 2 or more 	study:	study:	 Understand 	 Understand
programming	programming	Understand the	Understand the	several key	several key
languages, at	languages, at	hardware and	hardware and	algorithms	algorithms
least one of	least one of	software	software	that reflect	that reflect
which is textual,	which is textual,	components that make up computer	components that make up computer	computational	computational
to solve a	to solve a	systems, and how	systems, and how	thinking [for	thinking [for
variety of	variety of	they communicate	they communicate	example, ones	example, ones
computational	computational	with one another	with one another	for sorting	for sorting
problems	problems	and with other	and with other	and	and
 Create, reuse, 	Create, reuse,	systems	systems	searching];	searching];
revise and	revise and	Undertake creative	Undertake	use logical	use logical
repurpose	repurpose	projects that	creative projects	reasoning to	reasoning to
digital artefacts	digital artefacts	involve selecting,	that involve	compare the	compare the
for a given	for a given	using, and	selecting, using,	utility of	utility of
audience, with	audience, with	combining	and combining	alternative	alternative
attention to	attention to	multiple	multiple	algorithms for	algorithms for
trustworthiness,	trustworthiness,	applications,	applications,	the same	the same
design and	design and	preferably across a	preferably across a	problem	problem
usability	usability	range of devices, to achieve	range of devices, to achieve	 Use 2 or more 	Use 2 or more
		challenging goals,	challenging goals,	programming	programming
		including collecting	including	languages, at	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
Unit Name:	Unit Name:	Unit Name:	Unit Name:	Unit Name:	Unit Name:
Data Representation	Data	Boolean Logic	Boolean Logic	Programming Key Algorithms	Programming
	Representation				Key
					Algorithms
					Programming
					Key
					Algorithms
Description:	Description:	Description:	Description:	Description:	Description:
Students will learn how	Students will	Students will learn	Students will learn	Students will look at and	Students will
numbers can be represented	learn how	how to use simple	how to use simple	compare common searching	look at and
in binary, and be able to	numbers can be	Boolean logic	Boolean logic (AND,	(linear search and binary	compare
carry out simple operations	represented in	(AND, OR and NOT)	OR and NOT) to	search) and sorting (bubble	common
on binary numbers [for	binary, and be	to create logic	create logic circuits	and insertion) algorithms.	searching
example, binary addition,	able to carry out	circuits and some	and some of its uses	They will look at how these	(linear search
and conversion between	simple	of its uses in	in circuits and	algorithms work and how	and binary
binary and decimal]	operations on	circuits and	programming	they can be coded in Python.	search) and
Students will learn how	binary numbers	programming			sorting
instructions are stored and	[for example,				(bubble and
executed within a computer	binary addition,				insertion)
system; Students will also	and conversion				algorithms.
learn how data of various					They will look

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.
Mid unit test on binary, denary and hexadecimal End of unit test covering number conversions,	Assessment: Mid unit test on binary, denary and hexadecimal End of unit test covering	Assessment: Mid unit test on creating a circuit for an alarm system in LogicSim	Assessment: Mid unit test on creating a circuit for an alarm system in LogicSim	Assessment: • Create a presentation on the different searching and sorting algorithms (linear and binary search, bubble and insertion sort)	Assessment: Create a presentation on the different searching and sorting
representation of characters, images,	number conversions,			Create Python programs to	algorithms (linear and

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) • Create Python progra ms to demon strate the use of these search es 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

Understand simple	programme of	programme of	programme of	 Understand the 	Curriculum
Boolean logic [for	study:	study:	study:	hardware and	KS3
example, AND, OR	Understa	understand	 Understand 	software components	programme of
and NOT] and some	nd	simple	the hardware	that make up	study:
of its uses in circuits	simple	Boolean	and software	computer systems,	• Unders
and programming;	Boolean	logic [for	components	and how they	tand
understand how	logic [for	example,	that make up	communicate with	the
numbers can be	example,	AND, OR	computer	one another and with	hardw
represented in	AND, OR	and NOT]	systems, and how they	other systems	are and
binary, and be able to	and	and some	communicate	 Undertake creative 	softwa
carry out simple	NOT]	of its uses	with one	projects that involve	re
operations on binary	and	in circuits	another and	selecting, using, and	compo
numbers [for	some of	and	with other	combining multiple	nents
example, binary	its uses	programmi	systems	applications,	that
addition, and	in	ng;	Undertake	preferably across a	make
conversion between	circuits	understand	creative	range of devices, to	up
binary and decimal]	and	how	projects that	achieve challenging	compu
, , , , , , , , , , , , ,	program	numbers	involve	goals, including	ter
	ming;	can be	selecting,	collecting and	system
	understa	represente	using, and	analysing data and	s, and
	nd how	d in binary,	combining	meeting the needs of	how
	numbers	and be able	multiple	known users	they
	can be	to carry out	·	 Create, reuse, revise 	comm
	represen	simple	applications, preferably	and repurpose digital	unicat
	ted in	operations	·	artefacts for a given	e with one
	binary,	on binary	across a	audience, with	anothe
	and be	numbers	range of	attention to	r and
	able to	[for	devices, to		with
	30.00		achieve		

carry out	example,	challenging	trustworthiness,	other
simple	binary	goals,	design and usability	system
operatio	addition,	including		S
ns on	and	collecting		Undert
binary	conversion	and analysing		ake
numbers	between	data and		creativ
[for	binary and	meeting the		e
example,	decimal]	needs of		project
binary		known users		s that
addition,	•	Create,		involve
and		reuse, revise		selecti
conversi		and		ng,
on		repurpose		using,
between		digital		and
binary		artefacts for		combi
and		a given		ning
decimal]		audience,		multipl
		with		е
		attention to		applica
		trustworthin		tions,
		ess, design		prefera
		and usability		bly
				across
				а
				range
				of
				device
				s, to

		achiev
		e
		challen
		ging
		goals,
		includi
		ng
		collecti
		ng and
		analysi
		ng
		data
		and
		meetin
		g the
		needs
		of
		known
		users
		Create,
		reuse,
		revise
		and
		repurp
		ose
		digital
		artefac
		ts for a

audien
ce,
with
attenti
on to
trustw
orthin
ess,
design
and
usabili
ty