

# **Computer Science** -A Journey of Discovery

## Essential Skills taught in Computer Science

Listening Speaking **Problem Solving** Creativity **Staying Positive Aiming High** Leadership Teamwork



Microsoft Small Basic





### Year 7

Unit	Unit 0 – Understanding the TGGS Computer	Unit	Unit 1 – Computer Crime and Cyber Security	Unit	Unit 2 – Computer Basics	Unit	Unit 3 – BlockPy Programming (Baseline	Unit	Unit 4 – Flowol (Sequencing Instructions)
	System and E-Safety						Assessment of programming skills)		
Detail	Make students aware of the TGGS system and get them to					Detail	Students will have undertaken programming using block-		
	logon to the system, understand how the email works and	Detail	This unit covers some of the legal safeguards regarding	Detail	Students are introduced to the different components that		based programming software for example Scratch. They will	Detail	Students will develop their understanding of sequencing
	get them to logon to OneDrive and MS Teams		computer use, including overviews of the Computer Misuse		make up a computer system. This builds on knowledge from		develop their programming using the BlockPy programming		sets of instructions and the need to break down computing
			Act, Data Protection Act and GDPR and Copyright Law and		KS2 and introduces them to the idea of linking computers		language.		problems into smaller components.
			their implications for computer use. Phishing scams and		together in networks, finding out about how computers	KS3 NC	use 2 or more programming languages, at least one of which		
	They then study the first C Cefety medule from CCOD		other email frauds, hacking, "data harvesting" identity theft		communicate with one another through developing an	Statement	is textual, to solve a variety of computational problems;		
	They then study the first E-safety module from CEOP,		and safe use of social media are discussed together with		understanding of Binary.		make appropriate use of data structures [for example, lists,		This will be taught using flowcharts through the Flowol
	looking at the use of social media and looking at the		ways of protecting online identity and privacy. Health and	KS3 NC	understand simple Boolean logic [for example, AND, OR and		tables or arrays]; design and develop modular programs that		programme and will emulate real-life situations in which the
	difference between positive and unhealthy attention.		Safety Law and environmental issues such as the safe	Statement	NOT] and some of its uses in circuits and programming;		use procedures or functions		students need to solve the problems
KS3 NC	understand a range of ways to use technology safely,		disposal of old computers are also discussed.		understand how numbers can be represented in binary, and			KS3 NC	use 2 or more programming languages, at least one of which
Statement	respectfully, responsibly and securely, including protecting	KS3 NC	understand a range of ways to use technology safely,		be able to carry out simple operations on binary numbers		undertake creative projects that involve selecting, using, and	Statement	is toytual to colve a variety of computational problems:
	their online identity and privacy; recognise inappropriate	Statement	respectfully, responsibly and securely, including protecting		[for example, binary addition, and conversion between		combining multiple applications, preferably across a range	Statement	is textual, to solve a variety of computational problems;
	content, contact and conduct, and know how to report		their online identity and privacy: recognise inappropriate		binary and decimal		of devices, to achieve challenging goals, including collecting		make appropriate use of data structures [for example, lists,
	concerns		content, contact and conduct, and know how to report				and analysing data and meeting the needs of known users		tables or arrays]; design and develop modular programs that
Builds on	use technology safely, respectfully and responsibly; recognise		concerns		understand the hardware and software components that	Builds on	desian, write and debug programs that accomplish specific goals.		use procedures or functions
KS2	acceptable/unacceptable behaviour; identify a range of ways to	Builds on	use technology safely, respectfully and responsibly; recognise		make up computer systems, and how they communicate	KS2	including controlling or simulating physical systems; solve problems		design use and evaluate computational abstractions that
	report concerns about content and contact	KS2	acceptable/unacceptable behaviour; identify a range of ways to		with one another and with other systems		by decomposing them into smaller parts		model the state and behaviour of real world problems and
SMSC	ability to recognise the difference between right and wrong		report concerns about content and contact	Builds on	understand computer networks, including the internet; how they				model the state and behaviour of real-world problems and
	and to readily apply this understanding in their own lives,			KS2	can provide multiple services, such as the World Wide Web, and the		use sequence, selection, and repetition in programs; work with	Duilde au	physical systems
	recognise legal boundaries and, in so doing, respect the civil				opportunities they offer for communication and collaboration		variables and various forms of input and output	Builds on	design, write and debug programs that accomplish specific goals,
	and criminal law of England			SMSC	sense of enjoyment and fascination in learning about	SMSC	sense of enjoyment and fascination in learning about	K52	by decomposing them into smaller parts
	understanding of the consequences of their behaviour and     actions		use search technologies effectively, appreciate now results are		themselves, others and the world around them		themselves, others and the world around them		by decomposing them into smaller parts
FBV	an understanding of how citizens can influence decision-making	SMSC	A splitty to recognise the difference between right and wrong		use of imagination and creativity in their learning	EBV/	Use of imagination and creativity in their learning		use sequence, selection, and repetition in programs; work with
	through the democratic process	Sivise	and to readily apply this understanding in their own lives	FBV	Not directly taught	Sequencing	This unit builds on the understanding that students develop at key		variables and various forms of input and output
Sequencing	This is the initial unit for learners, taught early on to allow them to		recognise legal boundaries and, in so doing, respect the civil	Sequencing	This unit builds on the understanding that students develop at key	Sequencing	stage 2, and acts as a baseline assessment so that all students	SMSC	sense of enjoyment and fascination in learning about
	use the system in a sensible and safe way.		and criminal law of England		stage 2 and then seeks to develop a rudimentary understanding of		develop and arrive at a common skill level, before they move onto		themselves, others and the world around them
Careers	Understanding the role of social media and how it is used in the		understanding of the consequences of their behaviour and		vear 9		programming with text-based programming languages. Students		use of imagination and creativity in their learning
	current workplace.		actions	Careers	Network Engineers / Hardware Engineers.		who show a deeper level of understanding have extension tasks to	FBV	Not directly taught
Essential	Speaking / Listening	FBV	an understanding of how citizens can influence decision-making				stretch their learning	Sequencing	This unit develops the students computational thinking skills. With
Skills			through the democratic process		The development of Problem-Solving skills.	Careers	Software Engineers / Game Developers		the use of flowcharts they are given progressively more difficult
		Sequencing	This unit builds on the work from unit 0, with the development of	Essential	Speaking / Listening / Problem Solving		The device set of Dachlery Collins and Countrille at 10		problems that they will need to solve using sequencing,
			students knowing how to keep their data safe.	Skills		Eccontial	I ne development of Problem-Solving and Creativity skills.	Careers	Software Engineers
		Careers	Legislative careers			skille	Froben Solving / Creativity		
						JKIIIS			The development of Problem-Solving and Creativity skills.
		Essential	Speaking / Listening					Essential	Problem Solving / Creativity / Aiming High
		Skills						Skills	

### Year 8

Unit	Unit 5 – Small Basic	Unit	Unit 6 – E-Safety and the Law	Unit	Unit 7 – Artificial Intelligence and Machine	Unit	Unit 8 – Web-Page Design (HTML)	Unit	Unit 9 – Programming with Python
					Learning				
Detail	Students will be introduced to a BASIC programming	Detail	The students learn about keeping themselves safe online,	Detail	The students will learn about how computers can be used to make life easier for humans, whilst also developing an	Detail	The students will now apply their learning to develop a web-	Detail	The students will develop their understanding of
	them to develop their programming skills in a "text-based"		looking at how data can be shared and discussing what they need to think about when sharing information online for		understanding of the risks associated with being too reliant on the use of computers.		develop their creativity. They will combine data from a		this case Python, which is a natural language interface) and
KS3 NC	problems to solve.	KS3 NC	example the sharing of "nudes". understand a range of ways to use technology safely,	KS3 NC Statement	understand the hardware and software components that make up computer systems, and how they communicate	KS3 NC Statement	understand how instructions are stored and executed within	KS3 NC Statement	design, use and evaluate computational abstractions that
Statement	is textual, to solve a variety of computational problems;	Statement	respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate		with one another and with other systems	Statement	(including text, sounds and pictures) can be represented and	Jatement	physical systems
	tables or arrays]; design and develop modular programs that		content, contact and conduct, and know how to report concerns		design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and		manipulated digitally, in the form of binary digits		use 2 or more programming languages, at least one of which
	use procedures or functions	SMSC	<ul> <li>knowledge of, and respect for, different people's faiths, feelings and values</li> <li>sense of enjoyment and fascination in learning about themselves</li> </ul>	SMSC	physical systems           • sense of enjoyment and fascination in learning about		combining multiple applications, preferably across a range		make appropriate use of data structures [for example, lists,
	computational thinking [for example, ones for sorting and searching]: use logical reasoning to compare the utility of		<ul> <li>others and the world around them</li> <li>use of imagination and creativity in their learning</li> </ul>		<ul> <li>themselves, others and the world around them</li> <li>use of imagination and creativity in their learning</li> </ul>		and analysing data and meeting the needs of known users		use procedures or functions
Builds on	alternative algorithms for the same problem		<ul> <li>willingness to reflect on their experiences</li> <li>understanding of the consequences of their behaviour and actions</li> <li>interest in investigating and offering reasoned views about moral</li> </ul>	FBV	Willingness to reflect on their experiences     an acceptance that people having different beliefs to oneself (or     having none) should be accented and tolerated, and should not be		create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design		understand several key algorithms that reflect computational thinking [for example, ones for sorting and
KS2	including controlling or simulating physical systems; solve problems by decomposing them into smaller parts		and ethical issues and ability to understand and appreciate the viewpoints of others on these issues	Sequencing	the cause of prejudicial or discriminatory behaviour g This sequence of lessons builds and develops the understanding of	SMSC	and usability <ul> <li>sense of enjoyment and fascination in learning about</li> </ul>		searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem
	use sequence, selection, and repetition in programs; work with	FBV	an acceptance that people having different beliefs to oneself (or having none) should be accepted and tolerated, and should not be the cause of prejudicial or discriminatory behaviour		the hardware and software components of computer systems, taught in unit 2. They will also be able to critically evaluate the		<ul> <li>themselves, others and the world around them</li> <li>use of imagination and creativity in their learning</li> </ul>	SMSC	<ul> <li>sense of enjoyment and fascination in learning about themselves, others and the world around them</li> </ul>
SMSC	sense of enjoyment and fascination in learning about themselves, others and the world around them	Sequencin	g This sequence of lessons builds upon the work completed in unit 0 and unit 1. This is taught now as there are "difficult" concepts and	Careers	issues than can be caused by an over-reliance on computers. Software Engineer / Software Developer / Security Analyst	FBA	an acceptance that people having different beliefs to oneself (or having none) should be accepted and tolerated, and should not be the cause of prejudicial or discriminatory behaviour	FBV	use of imagination and creativity in their learning Not directly taught This set of lessons allows students to build on the work from unit 2
FBV	use of imagination and creativity in their learning     Not directly taught	Careers	material to be studied and this is recognised in the lesson plans. This again allows students to appreciate those careers where			Sequencing	This set of lessons allows students to build on the work from unit 3, allowing them to develop work for an identified audience.	Jequencing	<ul><li>4, 5 and 8 allowing them to develop work for an identified audience.</li></ul>
Sequencing	This unit builds on the previous units (Unit 3 and Unit 4), and the students are introduced to a "text-based" BASIC programming	Essential	legislation is discussed and additionally builds on their ability to discuss issues effectively.	Essential	This unit allows students to understand how important it is for teams from different disciplines to work together.		They will cover the need for specialist languages (in this case HTML)		They will cover the use of non-specialist languages (in this case
	development, allowing them to tackle increasingly difficult problems that will need the use of modular development in order	Skills	Speaking / Estening / Teanwork / Anning Fight / Leadership	Skills	Speaking / Estening / Teanwork / Leadership / Trobern Solving	Careers	for specific applications. Web Designer / Web Developer The need to combine several Essential Skills	Careers	Python) for general applications. Software Engineer / Software Developer / Data Scientist
Careers	to provide solutions to the tasks set. Software Engineers / Software Developer					Essential Skills	Problem Solving / Creativity / Teamwork / Aiming High / Leadership	Essential Skille	Problem Solving / Creativity / Teamwork / Aiming High / Leadership
	The development of Problem-Solving and Creativity skills and the								

Jnit	Unit 5 – Small Basic	Unit	Unit 6 – E-Safety and the Law	Unit	Unit 7 – Artificial Intelligence and Machine	Unit	Unit 8 – Web-Page Design (HTML)	Unit	Unit 9 – Programming with Python
				Detail	Learning				
Detail	Students will be introduced to a BASIC programming	Detail	The students learn about keeping themselves safe online,	Detail	The students will learn about now computers can be used to	Detail	The students will now apply their learning to develop a web-	Detail	The students will develop their understanding of
	language – they will use MS Small Basic, which will allow		looking at how data can be shared and discussing what they		make life easier for humans, whilst also developing an		page on a subject of their choice, thereby allowing them to		programming using text-based programming languages (in
	them to develop their programming skills in a "text-based"		need to think about when sharing information online for		understanding of the risks associated with being too reliant		develop their creativity. They will combine data from a		this case Python, which is a natural language interface) and
	programming language with increasingly more difficult		example the sharing of "nudes"		on the use of computers.		number of different sources to develop their web-page.		tackling computational problems of increasing complexity.
	problems to solve.	KS3 NC	understand a range of ways to use technology safely	KS3 NC	understand the hardware and software components that	KS3 NC	understand how instructions are stored and executed within	KS3 NC	design, use and evaluate computational abstractions that
S3 NC	use 2 or more programming languages, at least one of which	Statement	respectfully, responsibly and securely, including protecting	Statement	make up computer systems, and how they communicate	Statement	a computer system; understand how data of various types	Statement	model the state and behaviour of real-world problems and
tatement	is textual, to solve a variety of computational problems;		their online identity and privacy; recognise inappropriate		with one another and with other systems		(including text, sounds and pictures) can be represented and		physical systems
	make appropriate use of data structures [for example, lists.		content, content and conduct, and know how to report		destruction and evolution constant and shows that		manipulated digitally, in the form of binary digits		p., j
	tables or arrays]: design and develop modular programs that		content, contact and conduct, and know now to report		design, use and evaluate computational abstractions that				use 2 or more programming languages, at least one of which
	use procedures or functions	CMCC	CONCERNS		model the state and behaviour of real-world problems and		undertake creative projects that involve selecting, using, and		is textual, to solve a variety of computational problems;
		SIVISC	Knowledge of, and respect for, different people's faiths, feelings and values		physical systems		combining multiple applications, preferably across a range		make appropriate use of data structures [for example, lists,
	understand several key algorithms that reflect		<ul> <li>sense of enjoyment and fascination in learning about themselves,</li> </ul>	SMSC	sense of enjoyment and fascination in learning about		of devices, to achieve challenging goals, including collecting		tables or arrays]; design and develop modular programs that
	computational thinking [for example, ones for sorting and		others and the world around them		themselves, others and the world around them		and analysing data and meeting the needs of known users		use procedures or functions
	searching]: use logical reasoning to compare the utility of		use of imagination and creativity in their learning		use of imagination and creativity in their earning     willingness to reflect on their experiences				
	alternative algorithms for the same problem		Willingness to reflect on their experiences     understanding of the consequences of their behaviour and actions	FBV	an acceptance that people having different heliefs to oneself (or		create, reuse, revise and repurpose digital artefacts for a		understand several key algorithms that reflect
uilds on	desian, write and debua programs that accomplish specific goals.		<ul> <li>interest in investigating and offering reasoned views about moral</li> </ul>	150	having none) should be accepted and tolerated, and should not be		given audience, with attention to trustworthiness, design		computational thinking [for example, ones for sorting and
S2	including controlling or simulating physical systems: solve problems		and ethical issues and ability to understand and appreciate the		the cause of prejudicial or discriminatory behaviour		and usability		searching]; use logical reasoning to compare the utility of
	by decomposing them into smaller parts		viewpoints of others on these issues	Sequencing	This sequence of lessons builds and develops the understanding of	SMSC	sense of enjoyment and fascination in learning about		alternative algorithms for the same problem
		FBV	an acceptance that people having different beliefs to oneself (or		the hardware and software components of computer systems,		themselves, others and the world around them	SMSC	sense of enjoyment and fascination in learning about
	use sequence, selection, and repetition in programs; work with		having none) should be accepted and tolerated, and should not be		taught in unit 2. They will also be able to critically evaluate the		use of imagination and creativity in their learning		themselves, others and the world around them
	variables and various forms of input and output	Convensing	the cause of prejudicial or discriminatory behaviour		issues than can be caused by an over-reliance on computers.	FBV	an acceptance that people having different beliefs to oneself (or		<ul> <li>use of imagination and creativity in their learning</li> </ul>
MSC	sense of enjoyment and fascination in learning about	Sequencing	and unit 1. This is taught new as there are "difficult" concents and	Careers	Software Engineer / Software Developer / Security Analyst		having none) should be accepted and tolerated, and should not be	FBV	Not directly taught
	themselves, others and the world around them		material to be studied and this is recognised in the lesson plans				the cause of prejudicial or discriminatory behaviour	Sequencing	, This set of lessons allows students to build on the work from unit 3,
DV/	Use of imagination and creativity in their learning	Careers	This again allows students to appreciate those careers where			Sequencing	This set of lessons allows students to build on the work from unit 3,		4, 5 and 8 allowing them to develop work for an identified
equencing	This unit builds on the previous units (Unit 3 and Unit 4) and the		legislation is discussed and additionally builds on their ability to		This unit allows students to understand how important it is for		allowing them to develop work for an identified audience.		audience.
equencing	students are introduced to a "text-based" BASIC programming		discuss issues effectively.		teams from different disciplines to work together.		The will ensure the good for an exclusive law many of the this encould be		
	language. The software still scaffolds their programming	Essential	Speaking / Listening / Teamwork / Aiming High / Leadership	Essential	Speaking / Listening / Teamwork / Leadership / Problem Solving		for specific applications		They will cover the use of non-specialist languages (in this case
	development, allowing them to tackle increasingly difficult	Skills		Skills		Careers	Web Designer / Web Developer	Caroors	Python) for general applications.
	problems that will need the use of modular development in order						The need to combine several Essential Skills	Careers	Software Engineer / Software Developer / Data Scientist
	to provide solutions to the tasks set.					Eccontial	Problem Solving / Creativity / Teamwork / Aiming High / Leadership		Problem Colling (Constitute / Transmonth ( Alimina With ( transmonth)
areers	Software Engineers / Software Developer					Skills	Froben Solving / Cleativity / Teamwork / Anning Fight / LeaderShip	Essential	Problem Solving / Creativity / Teamwork / Alming High / Leadership
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#### Year 9

Unit	Unit 10 – App Development with AppShed	Unit	Unit 11 – Handling Data on Computers	Unit	Unit 12 – Turing Tumble (Developing Logical	Unit	Unit 13 – Girls Who Code (Advanced Python)	Unit	Unit 14 – Online Safety and Data Security
					Operations)				
Detail	The students will combine their learning from the previous	Detail	The students learn about how data and memory is used in	Detail	The students learn about how logical operations are	Datall	The students undertaile a consider of <b>D</b> there as disc	Data II	The students identify and discuss the continue threads that
	units that they have studied to make an App that can be		computers, converting between different numbering		undertaken on computers. This is done through a game	Detail	The students undertake a number of Python coding	Detail	The students identify and discuss the various threats that
	used to solve a problem that they have identified.		systems (denary / binary / hexadecimal). They also learn		(Turing Tumble) and is introduced as a self-paced unit that		challenges, that build upon earlier programming work.		there are for data security and develop how their digital
KS3 NC	understand how instructions are stored and executed within		about how searches and sorts can be used on data and		will allow the students to develop their understanding from		These tasks have been deigned to engage girls in		footprint is arrived at.
Statement	a computer system; understand how data of various types		finally they see how this can be applied in order to store		unit 11 and to appreciate how AND. OR and NOT logic gates		programming and they get progressively more challenging		
	(including text, sounds and pictures) can be represented and		sound and images effectively		work in reality		as they progress through the unit.		They develop a sound understanding of the various methods
	manipulated digitally in the form of binary digits	KS3 NC	understand several key algorithms that reflect computational	KS3 NC	understand several key algorithms that reflect computational	KS3 NC	design, use and evaluate computational abstractions that model the		that can be used for keeping data safe online.
	interiptideed digitality, in the form of binary digits	Statement	thinking [for example, ones for sorting and searching]: use logical	Statement	thinking [for example, ones for sorting and searching]: use logical	Statement	state and behaviour of real-world problems and physical systems.	KS3 NC	design, use and evaluate computational abstractions that model
	undertake creative projects that involve selecting, using, and		reasoning to compare the utility of alternative algorithms for the		reasoning to compare the utility of alternative algorithms for the			Statement	the state and benaviour of real-world problems and physical
	combining multiple applications, preferably across a range		same problem.		same problem.		understand several key algorithms that reflect computational		understand several key algorithms that reflect computational
	of devices, to achieve challenging goals, including collecting						thinking for example, ones for sorting and searching); use logical		thinking [for example, ones for sorting and searching]; use logical
	and analysing data and meeting the needs of known users		understand simple Boolean logic [for example, AND, OR and NOT]		understand simple Boolean logic [for example, AND, OR and NOT]		reasoning to compare the utility of alternative algorithms for the		reasoning to compare the utility of alternative algorithms for the
	and analysing data and meeting the needs of known users		and some of its uses in circuits and programming; understand how		and some of its uses in circuits and programming; understand how		same problem.		same problem.
	create, reuse, revise and repurpose digital artefacts for a		numbers can be represented in binary, and be able to carry out		numbers can be represented in binary, and be able to carry out		use 2 or more programming languages, at least one of which is		design, use and evaluate computational abstractions that model
	given audience, with attention to trustworthiness, design		simple operations on binary numbers [for example, binary addition,		simple operations on binary numbers [for example, binary addition,		textual, to solve a variety of computational problems; make		the state and behaviour of real-world problems and physical
	and usability		and conversion between binary and decimal].		and conversion between binary and decimal].		appropriate use of data structures [for example, lists, tables or		systems.
SMSC	knowledge of and respect for different people's faiths		understand the hardware and software components that make up		understand the hardware and software components that make up		arrays]; design and develop modular programs that use procedures		understand a range of ways to use technology safely, respectfully,
511150	feelings and values		computer systems, and how they communicate with one another		computer systems, and how they communicate with one another		or functions.		identity and securely, including protecting their online
	<ul> <li>sense of enjoyment and fascination in learning about</li> </ul>		and with other systems		and with other systems	SMSC	sense of enjoyment and fascination in learning about themselves,		and conduct and know how to report concerns
	themselves, others and the world around them			SMSC	sense of enjoyment and fascination in learning about themselves,		others and the world around them	SMSC	sense of enjoyment and fascination in learning about
	use of imagination and creativity in their learning		understand how instructions are stored and executed within a		others and the world around them		use of imagination and creativity in their learning     willingness to reflect on their experiences		themselves, others and the world around them
	willingness to reflect on their experiences		computer system; understand how data of various types (including		use of imagination and creativity in their learning	FBV	Respecting the values, ideas and beliefs of others whilst not		<ul> <li>use of imagination and creativity in their learning</li> </ul>
FBV	an understanding of how citizens can influence decision-making		text, sounds and pictures) can be represented and manipulated	501/	willingness to reflect on their experiences		imposing our own others.		willingness to reflect on their experiences
	through the democratic process		digitally, in the form of binary digits.	FBV	This sequence of lessons builds upon the work completed in unit 2	Sequencing	This sequence of lessons builds upon the work completed in unit 3,	FBV	Respecting the values, ideas and beliefs of others whilst not
Sequencing	This set of lessons builds on the work from the previous units in the	SMSC	sense of enjoyment and fascination in learning about themselves,	Sequencing	(from year 7) and unit 11 this practical understanding of how logic		unit 5 and unit 9. It is designed to give students increasingly more		imposing our own others.
	development of an App to solve a problem for a given audience that		others and the world around them		(itom year 7) and unit II – this practical understanding of now logic		complex problems to solve and to develop their confidence in	Sequencing	This sequence of lessons builds upon the work completed in unit 0,
	they have identified.		willingness to reflect on their experiences	Careers	Software Analyst / Software Engineer / Systems Analyst / Network		tackling programming problems.		unit 1 and unit 6. The students apply their knowledge from the
Careers	Systems Analyst / Web Developer / Software Engineer / Software	FBV	Not directly taught	Curcers	Engineer.	Careers	Software Analyst / Software Engineer / Systems Analyst		course to this point to allow them to assess the risks to their online
	Developer	Sequencing	This sequence of lessons builds upon the work completed in unit 2						security and to prepare them for using data from another outside
	Opportunity to work with local businesses		in year 7 and allows students to understand more clearly why issues		This unit allows a number of Essential Skills to be tackled	E	This unit allows a number of Essential Skills to be tackled		source in unit 15.
	Opportunity to work with local busillesses.		such as overflow errors occur – that even computer systems have	Essential	Listening / Problem Solving / Creativity / Staying Positive / Aiming	Essential	Listening / Problem Solving / Creativity / Staying Positive / Alming	Careers	Software Analyst / Software Engineer / Systems Analyst /Cyber
	The need to combine several Essential Skills		limitations.	Skills	High			<b>-</b>	Security Specialist
Essential	Speaking / Listening / Problem Solving / Creativity / Teamwork /	Careers	Software Analyst / Software Engineer / Systems Analyst / Network						This unit allows a number of Essential Skills to be tackled
Skills	Aiming High / Leadership		Engineer.					Essential	Listening / Problem Solving / Creativity / Staving Positive / Aiming
		-	This unit allows a number of Essential Skills to be tackled					Skills	High
		Essential	Listening / Problem Solving / Creativity / Staying Positive / Aiming						
		Skills	High						

Unit	Unit 15 – Mars Insight (Applied Programming and
	Data Modelling)
Detail	The students are given a problem to solve (which is to create
	a game that is suitable for younger ages students aged 8 to
	11), where they will need to choose the software and
	undertake the complete Analyse – Design – Implement –
	Test – Evaluate cycle (ADITE).
	They then complete the course by analysing data from the
	Mars InSight mission.
KS3 NC	design, use and evaluate computational abstractions that model the
Statement	state and behaviour of real-world problems and physical 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 2 or more programming languages, at least one of which is
	appropriate use of data structures [for example, lists, tables or
	appropriate use of data structures [for example, lists, tables of
	or functions.
	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 trustworthiness, design and usability.
SMSC	<ul> <li>sense of enjoyment and fascination in learning about themselves,</li> </ul>
	use of imagination and creativity in their learning
	willingness to reflect on their experiences
FBV	Respecting the values, ideas and beliefs of others whilst not
	imposing our own others.
Sequencing	This sequence of lessons is intended to allow the students a degree
	of freedom, choosing the most suitable software and independently
	developing the criteria for the project.
Careers	Software Analyst / Software Engineer / Systems Analyst
	This unit allows a number of Essential Skills to be tackled
Essential	Listening / Problem Solving / Creativity / Staying Positive / Aiming
Skills	High / Teamwork / Leadership

use of their skills in developing resilience.

Problem Solving / Creativity / Aiming High

Essential

Skills

HEME 1 - HARDWARE       THEME 5 - OPERATING SYSTEMS         1 Architecture       5.1 Managing Resources         2 Input / Output       5.2 Interfaces         3 Storage       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       6.1 Levels of Computer         2.1 Working Systematically       6.1 Levels of Computer         2.2 Abstraction       Language         4EME 2 - LOGICAL OPERATIONS       THEME 7 - SOFTWARE ENGINEERING         1 Logical Operators       7.1 Software Tools         2 Boolean Logic       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.8 Project Work and Practical Examination Preparation         2.5 Handling Data       2.2.9 Security Textual Examination Preparation         2.6 Sorting / Searching       2.1 Sills Development         2.1 Skills Development       2.2.9 Security Techniques         EMEM 2 - COMMUNICATION       THEME 8 - PROGRAM CONSTRUCTION
1 Architecture       5.1 Managing Resources         2 Input / Output       5.2 Interfaces         3 Storage       5.3 Utility Software         4 Additional Components       5         5 Embedded Systems       5 <b>HEME A - PROBLEM SOLVING THEME 6 - PRINCIPLES OF PROGRAMMING</b> 2.1 Working Systematically       6.1 Levels of Computer         2.2 Abstraction       Language <b>FEME 2 - LOGICAL OPERATIONS THEME 7 - SOFTWARE ENGINEERING</b> 1 Logical Operators       7.1 Software Tools         2 Boolean Logic       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.8 Project Work and Practical Examination Preparation         2.5 Handling Data       2.2.9 Security Techniques         2.6 Sorting / Searching       2.2.9 Security Techniques         2.7 Testing and Evaluation <b>THEME E - SECURITY AND AUTHENTICATION</b> 3.1 Skills Development       2.2.9 Security Techniques <b>TEME S - COMMUNICATION THEME 8 - PROGRAM CONSTRUCTION</b> 1 Networks       8.1 Compilers, Interpreters and Assemblers
2 Input / Output       5.2 Interfaces         3 Storage       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       5.3 Utility Software         4EME A - PROBLEM SOLVING       THEME 6 - PRINCIPLES OF PROGRAMMING         2.1 Working Systematically       6.1 Levels of Computer         2.2 Abstraction       Language         1 Logical Operators       7.1 Software Tools         2 Boolean Logic       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.2.9 Security Techniques         2.5 Handling Data       2.2.9 Security Techniques         4EME C - PYTHON PROGRAMMING       2.2.9 Security Techniques         4EME S - COMMUNICATION       THEME E - PROGRAM CONSTRUCTION         3.1 Skills Development       2.2.9 Security Techniques
3 Storage       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       5.3 Utility Software         4 Additional Components       5.3 Utility Software         5 Embedded Systems       6.1 Levels of Computer         2.2 Abstraction       Language         4 EME 2 - LOGICAL OPERATIONS       THEME 7 - SOFTWARE ENGINEERING         1 Logical Operators       7.1 Software Tools         2 Boolean Logic       7.1 Software Tools         4 Programming Constructs       7.1 Software Tools         2.5 Handling Data       2.2.8 Project Work and Practical Examination Preparation         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         4EME 3 - COMMUNICATION       THEME 8 - PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers
4 Additional Components       -         5 Embedded Systems       -         FEME A - PROBLEM SOLVING       THEME 6 - PRINCIPLES OF PROGRAMMING         2.1 Working Systematically       6.1 Levels of Computer         2.2 Abstraction       Language         FEME 2 - LOGICAL OPERATIONS       THEME 7 - SOFTWARE ENGINEERING         1 Logical Operators       7.1 Software Tools         2 Boolean Logic       -         FEME B - ALGORITHMS AND PROGRAMMING CONSTRUCTS       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       -         2.5 Handling Data       -         2.6 Sorting / Searching       -         2.7 Testing and Evaluation       -         FEME 2 - COMMUNICATION       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         *EME 3 - COMMUNICATION       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       -
5 Embedded Systems         HEME A - PROBLEM SOLVING         14 EME A - PROBLEM SOLVING         2.1 Working Systematically         2.2 Abstraction         Language         HEME 2 - LOGICAL OPERATIONS         1 Logical Operators         2 Boolean Logic         HEME B - ALGORITHMS AND PROGRAMMING CONSTRUCTS         2.3 Algorithms         2.4 Programming Constructs         2.5 Handling Data         2.6 Sorting / Searching         2.7 Testing and Evaluation         HEME 2 - CPYTHON PROGRAMMING         3.1 Skills Development         1 Lewes 3 - COMMUNICATION         1 Networks         2 Internet
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2.2 Abstraction       Language         HEME 2 - LOGICAL OPERATIONS       THEME 7 - SOFTWARE ENGINEERING         1 Logical Operators       7.1 Software Tools         2 Boolean Logic       THEME D - PYTHON PROGRAMMING         +EME B - ALGORITHMS AND PROGRAMMING CONSTRUCTS       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.2.8 Project Work and Practical Examination Preparation         2.5 Handling Data       2.2.8 Project Work and Practical Examination Preparation         2.6 Sorting / Searching       2.7 Testing and Evaluation         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         HEME 3 - COMMUNICATION       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 – DECOMPARATION
HEME 2 - LOGICAL OPERATIONSTHEME 7 - SOFTWARE ENGINEERING1 Logical Operators7.1 Software Tools2 Boolean Logic7.1 Software ToolsHEME B - ALGORITHMS AND PROGRAMMING CONSTRUCTSTHEME D - PYTHON PROGRAMMING2.3 Algorithms2.2.8 Project Work and Practical Examination Preparation2.4 Programming Constructs2.2.8 Project Work and Practical Examination Preparation2.5 Handling Data2.2.8 Project Work and Practical Examination Preparation2.6 Sorting / Searching7.1 Software Tools2.7 Testing and Evaluation7.1 Software Security AND AUTHENTICATION3.1 Skills Development2.2.9 Security TechniquesHEME 3 - COMMUNICATIONTHEME 8 - PROGRAM CONSTRUCTION1 Networks8.1 Compilers, Interpreters and Assemblers2 Internet7.1 Software Tools
1 Logical Operators       7.1 Software Tools         2 Boolean Logic       THEME B - ALGORITHMS AND PROGRAMMING CONSTRUCTS         1 Logical Operators       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.2.8 Project Work and Practical Examination Preparation         2.5 Handling Data       2.2.8 Project Work and Practical Examination Preparation         2.6 Sorting / Searching       THEME C - PYTHON PROGRAMMING         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         4EME 3 - COMMUNICATION       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 – DEVERTION PROGRAM CONSTRUCTION
2 Boolean Logic       THEME B - ALGORITHMS AND PROGRAMMING CONSTRUCTS       THEME D - PYTHON PROGRAMMING         2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.2.8 Project Work and Practical Examination Preparation         2.5 Handling Data       2.2.8 Project Work and Practical Examination Preparation         2.6 Sorting / Searching       2.7 Testing and Evaluation         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         1 EME 3 - COMMUNICATION       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       Function of the provide optimized o
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2.3 Algorithms       2.2.8 Project Work and Practical Examination Preparation         2.4 Programming Constructs       2.5 Handling Data         2.5 Handling Data       2.6 Sorting / Searching         2.6 Sorting / Searching       2.7 Testing and Evaluation         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         1EME 3 - COMMUNICATION       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 – DECOMPTION DECOMPT
2.4 Programming Constructs       2.5 Handling Data         2.5 Handling Data       2.6 Sorting / Searching         2.6 Sorting / Searching       2.7 Testing and Evaluation <b>HEME C - PYTHON PROGRAMMING THEME E - SECURITY AND AUTHENTICATION</b> 3.1 Skills Development       2.2.9 Security Techniques <b>HEME 3 - COMMUNICATION THEME 8 – PROGRAM CONSTRUCTION</b> 1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 – COMMUNICATION
2.5 Handling Data       2.6 Sorting / Searching         2.6 Sorting / Searching       2.7 Testing and Evaluation         2.7 Testing and Evaluation       THEME E - SECURITY AND AUTHENTICATION         4EME C - PYTHON PROGRAMMING       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         4EME 3 - COMMUNICATION       THEME 8 - PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 - OPPORT
2.6 Sorting / Searching       2.7 Testing and Evaluation         1 EME C - PYTHON PROGRAMMING       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         1 Networks       THEME 8 – PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers
2.7 Testing and Evaluation       THEME C - PYTHON PROGRAMMING         HEME C - PYTHON PROGRAMMING       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         HEME 3 - COMMUNICATION       THEME 8 - PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 - COMMUNICATION
HEME C - PYTHON PROGRAMMING       THEME E - SECURITY AND AUTHENTICATION         3.1 Skills Development       2.2.9 Security Techniques         HEME 3 - COMMUNICATION       THEME 8 - PROGRAM CONSTRUCTION         1 Networks       8.1 Compilers, Interpreters and Assemblers         2 Internet       THEME 9 - COMMUNICATION
3.1 Skills Development     2.2.9 Security Techniques       IEME 3 - COMMUNICATION     THEME 8 - PROGRAM CONSTRUCTION       1 Networks     8.1 Compilers, Interpreters and Assemblers       2 Internet     THEME 9 - PROGRAM CONSTRUCTION
HEME 3 - COMMUNICATION     THEME 8 - PROGRAM CONSTRUCTION       1 Networks     8.1 Compilers, Interpreters and Assemblers       2 Internet     9 Sector 2 Sect
1 Networks     8.1 Compilers, Interpreters and Assemblers       2 Internet     9.1 Compilers, Interpreters and Assemblers
2 Internet
HEME 4 - ORGANISATION AND STRUCTURE OF DATA       THEME 9 – SECURITY AND DATA MANAGEMENT
1 Representation of Numbers 9.1 Data Security
2 Representation of Graphics and Sound 9.2 Data Management
3 Storage of Characters 9.3 Compression
4 Data Types 9.4 Network Security
5 Data Structures 9.5 Cybersecurity
6 File Design
7 Data Verification and Validation
10 1 Ethical
10.3 Environmental Issues

Course component	Description
Component 1 - Programming and System	This component investigates programs, data
Development	structures, algorithms, logic, programming
	methodologies and the impact of computer
	science on society
Component 2 - Computer Architecture, Data,	This component investigates computer
Communication and Applications	architecture, communication, data
	representation, organisation and structure of
	data, programs, algorithms and software
	applications.
Component 3 – Programmed Solution to a	Candidates discuss, investigate, design,
Problem	prototype, refine and implement, test and
	evaluate a computerised solution to a problen
	chosen by the candidate which must be solved
	using original code (programming).

