St Cuthbert's RC High School
Curriculum Map – Computer Science

Computer Science Curriculum Map	
St. Cuthbert's Curriculum Vision	Here at St. Cuthbert's, our curriculum is rooted in our Catholic faith and the principles laid out in Catholic Social Teaching. Our goal is to help every child shine, feel valued, and make a positive mark in the world. With our core CARE values—Catholicity, Aspiration, Respect, and Excellence—guiding us, we aim to nurture each child's academic, social, emotional, and spiritual growth. We strive to foster an environment where every student feels secure, included, and supported, both inside the classroom and out. Complete curriculum vision.docx
Subject statement of intent	It is the aim of the department to enable students to develop skills and knowledge in Computer Science and Digital Technologies to prepare them for a future in a world where the use of this technology is fully embodied. Built on enthusiasm and a love of learning, it is the aim to encourage students to progress with this promising career path. It is the intent to develop problem solving skills through computational thinking which is at the core of the curriculum and embedded throughout units exploring algorithmic thinking and programming languages. Students will develop their ICT skills using a range of software applications and will develop a practical understanding of how to operate safely online. Students will explore what happens "under the hood", the communication of devices within networks and explore the wider issues of computing discussing ethical, legal and environmental issues. There will be no limitation placed on students with the programming skills the learners can develop, and they will be encouraged to undertake their own personal study and join further enrichment activity.

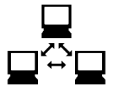
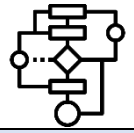
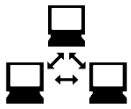
Curriculum Icons Key				
Catholic Mission	**Careers (CEIAG)**	**Cultural Capital and Enrichment Opportunities**	**Preparing for life in modern Britain**	**Skills for Life**

Computer Science 'at a glance'

KS3: Students have two lessons per fortnight, KS4: Students have five lessons per fortnight in Year 10 and six lessons per fortnight in Year 11.

AUTUMN	SPRING	SUMMER

St Cuthbert's RC High School
Curriculum Map – Computer Science

Year 7		
ICT Skills (Microsoft) Exploring a Digital World 	Scratch Programming Computer Systems 	Ethical Issues Mathematics and Logical Skills
Year 8		
Computer Systems HTML 	Python Programming 	Networks Ethical Issues 
Year 9		
Computer Systems Introduction to Business Studies 	Python Programming Algorithm Design 	ICT Skills (Spreadsheets) ICT Skills (APP Development)
Year 10		
System Architecture Memory Storage 	Computer Networks Network Security 	Algorithms Programming Techniques
Year 11		
Producing Robust Programs Programming Languages Boolean Logic 	System Software Ethics Revision 	Revision / Examination

St Cuthbert's RC High School
Curriculum Map – Computer Science

Year 7 Curriculum Map

YEAR 7		AUTUMN		SPRING		SUMMER	
Year 7	**Theme**	**ICT Skills (Microsoft Office Packages)**		**Scratch Programming**		**Ethical Issues**	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• Passwords • Presentation Software using PowerPoint • Word Processing Software • Spreadsheet Software • Formulas and Graphs	• Creation of passwords to protect schoolwork. • Creation of digital artefacts within software packages.	• Visual Programming • Variables • Loops – Iteration • If Statements – Selection • Maths Operators	• Creation of visual programs using Scratch which contain the following techniques: ○ Variables ○ Loops ○ If Statements ○ Operators	• Technology Development • Artificial Intelligence • Laws • Environment • Health and Safety	• Discussions of how robots and AI may impact jobs/careers. • Examples of the breaking of computer laws. • Examples of Health and Safety regulations
	Texts to be studied	**How spreadsheets work - Spreadsheets - KS3 ICT Revision - BBC Bitesize**		**Scratch - Starter Projects** **Use the Scratch starter packs to create a story!**		**Computers and the law - The law and ethics - KS3 Computer Science Revision - BBC Bitesize**	
	Rationale	**Previous Links:** Computer Programming, Logical Reasoning, Digital Product Creation and E-Safety are statutory requirements from the NC. Students will experience CS as a discrete subject for the first time in Year 7. **Future Links:** Established computer literacy and competency will enable students to		**Previous Links:** Students have developed skills in computer literacy. Computer Programming skills are statutory requirements at KS1/2. **Future Links:** Students will develop on their skills learnt in Visual Programming to practice Textual Programming in Year 8+. **Why?**		**Previous Links:** E-Safety will be built upon giving more breadth of how technology impacts a wider society. **Future Links:** Ethics and Laws are also part of the CS GCSE which allows students to gain a foundation of knowledge which can be expanded. **Why?**	

		access their future learning using general Microsoft software packages. **Why?** This sets the expectation of working within the department, using Microsoft packages and improves their digital literacy which would be a foundation skill for many future careers, and part of their communication whilst at SCRCHS.	By studying Visual Programming, this will allow students to spot links between Visual and Textual Programming which they will study as part of the NC in Year 8/9 and as part of the GCSE.	Students need a broad understanding of ethical issues and support catholic social teaching.
	Theme	**Exploring a Digital World (E-Safety)**	**Computer Systems**	**Mathematics and Logical Thinking**
	Knowledge	**Substantive Knowledge** • Digital Footprint • Cyberbullying • Social Networks • Influencers • Risks of Video Games • Online Safety **Disciplinary Knowledge** • Creation of own digital footprint. • Reporting Cyberbullying • Research into Social Networks and Influencers. • Discussion of online safety pledges.	**Substantive Knowledge** • Computer Systems • Inputs and Outputs • Hardware and Software • Storage Devices **Disciplinary Knowledge** • Examples of computer systems that would fit the typical description. • Discussion of examples for scenarios.	**Substantive Knowledge** • Abstraction • Boolean Operators AND, OR and NOT • Encryption **Disciplinary Knowledge** • Practical application of abstraction to a given problem. • Production of programs utilising operators. • Application of encryption processes
	Texts to be studied	File sharing, cyberbullying and smartphones - eSafety - KS3 ICT Revision - BBC Bitesize	Computer devices - Digital devices - KS3 Computer Science Revision - BBC Bitesize	What is logical reasoning? - Logical reasoning - KS3 Computer Science Revision - BBC Bitesize
	Rationale	**Previous Links:** Computer Programming, Logical Reasoning, Digital Product Creation and E-Safety are statutory requirements from the NC. Students	**Previous Links:** Students have developed skills in computer literacy. Studying Computer Systems are statutory requirements at KS1/2.	**Previous Links:** Computer Programming in the Spring Term has given students opportunities to build logical thinking skills. **Future Links:**

		will experience CS as a discrete subject for the first time in Year 7. **Future Links:** Understanding of E-Safety will support students in wider areas of life, Ethics at KS4 Computer Science and within their Skills for Life lessons. **Why?** It is important that students understand E-Safety as some students may be experiencing social media for the first time.	**Future Links:** A secure platform for Computer Systems will support for learning in Year 8+ where knowledge is built upon. **Why?** Components of Computer Systems knowledge are transferrable skills that can be applied across key stages and is a key part of GCSE Computer Science.	Logical Skills are essential to access programming elements to a GCSE in CS, they are also key to solving many aspects of wider life. Boolean Logic also forms a unit of the GCSE CS. **Why?** Students need to establish a secure foundation of Computational Thinking skills to access Algorithm Design and Programming which is a key strand of Computer Science. Focus on Mathematics will not only support the skills required for this subject but also support the growth in attainment of Mathematics within the school.
	Assessment	KS3 Assessment strategy - Computer Science.docx Students will sit a formative assessment at the end of each unit of work. Scores will be recorded centrally and will be used to inform future teaching. Students class teacher will mark these and provide individual and whole class feedback. Some of the formative assessments will have a practical element due to the nature of the subject. Students will sit three summative assessments (data drop points), the class teacher will again provide individual and whole class feedback, offering verbal improvements to the classroom. As part of all lessons at KS3, students will have a review task where they will review their learning from that lesson.		
	Homework	Students will be set a piece of homework per half term on the topic they have been studying. They will be able to take their exercise books home to be able to complete this homework. This homework will be used to assess students learning and understanding of their knowledge and skills and will provide a revision resource for formative and summative assessments. Computer Science Homework Policy.docx		

Year 8 Curriculum Map

YEAR 8	AUTUMN	SPRING	SUMMER
Theme	**Computer Systems**	**Python Programming**	**Networks**

St Cuthbert's RC High School
Curriculum Map – Computer Science

Year 8	Knowledge	Substantive Knowledge	Disciplinary Knowledge	Substantive Knowledge	Disciplinary Knowledge	Substantive Knowledge	Disciplinary Knowledge

		• Year 7 Knowledge
		• Internal Computer Parts
		• Binary Numbers
		• Image Representation
		• Sound Representation
		• Text Representation
			• Converting between binary and denary numbers.
			• Recognising types of images
			• Recognising techniques within sound representation
				• Algorithm
				• Difference between visual and textual programming
				• Variables
				• Input statements
				• Sequential Statements
					• Creation of programs in visual blocks
					• Creation of programs in Edu Blocks
					• Creation of programs in Textual Python
					• Creation of programs in Python using the following techniques:
					  ○ Variables
					  ○ Input Statements
					  ○ Print Statements
						• Purpose of a Network
						• Advantages and Disadvantages of a Network
						• Types of Topologies
						• Difference between LAN and WAN
						• Network Hardware
							• Application of networks to a school setting
							• Applying topologies to creating a network.
							• Real-world examples of LAN and WAN.

	Texts to be studied	Representing data – Representing text, images and sound – KS3 Computer Science Revision – BBC Bitesize		Arithmetic – Programming basics – KS3 Computer Science Revision – BBC Bitesize		What is a network? – Introduction to networks – KS3 Computer Science Revision – BBC Bitesize	
	Rationale	**Previous Links:** Students will revisit previous learning of inputs, outputs, hardware and software they did in Year 7, they will then develop this knowledge of hardware to looking at specific components inside the computer. **Future Links:**		**Previous Links:** Students have experienced a Visual Based Programming language in year 7 where they have started to develop programming skills. They will seek to embed all of these skills into using a textual programming language. These skills will be built upon in Year 9+. **Future Links:**		**Previous Links:** Students have learnt how computers work and their internal components, they will now expand their knowledge by exploring how they communicate with other devices externally. **Future Links:** Networks and Network Security forms two units at KS4 therefore is vital to	

		Knowledge that is provided throughout computer systems will provide a further foundation for access at Year 9 and KS4 Computer Science curriculum. **Why?** Students need an in-depth knowledge of computer systems to access a large amount of learning at KS4.	Further Textual Programming will be learnt in Year 9 and at GCSE. This provides students with a platform to build their problem-solving skills and understanding of computational thinking. **Why?** Students need an in-depth understanding of programming. This is a large proportion of the GCSE and essential learning for Paper 2, all skills will be transferrable across KS4. This also supports learning at KS4 not having to deliver for the first time but to revisit taught content. If the teacher feels it necessary, there will be an option to use Small Basic for the first few lessons before moving onto Python Programming / continuing with visual programming.	have a foundation of learning in these units. **Why?** Students need a secure foundation of the structure and purpose of networks to develop their understanding in future learning about Networks at KS4.

Theme	**HTML**		**Python Programming**		**Ethical Issues**	
Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
	• Features of positive website design • Knowledge of HTML tags	• Creation of digital artefact to represent web design • Creation of HTML website using HTML tags and design features	• Selection Statements • Iteration Statements (For and While)	• Creation of programs in Textual Python • Creation of programs in Python using the following techniques:	• Spam and Phishing • Types of Hackers • Network Recovery Techniques • Real and Fake Information	• Application of Spam and Phishing to given examples. • Examples of real-world hacking scenarios

					○ Selection Statements (if-elif-else) ○ Iteration (for / while)		• Applying understanding of real and fake information to examples
	Texts to be studied	**www.w3schools.com** **Create your own!**		**Selection - Selection in programming - KS3 Computer Science Revision - BBC Bitesize**		**Bias and reliability - Bias and reliability - KS3 Computer Science Revision - BBC Bitesize**	
	Rationale	**Previous Links:** Students started looking at visual programming in year 7, they will explore their first (of two) textual programming languages using HTML. **Future Links:** The knowledge gained using HTML will not be visited directly again, but another textual language will be taught further in the year and onwards. HTML does form a part of A-Level if students do consider further study. **Why?** Students should experience a breadth of learning in textual programming to secure transferrable skills in computational thinking. Students must study two textual languages; HTML provides an accessible approach to this introduction and raises aspirations informing students of future careers in web design.		**Previous Links:** Students have experienced a Visual Based Programming language in year 7 where they have started to develop programming skills. They will seek to embed all of these skills into using a textual programming language. These skills will be built upon in Year 9+. **Future Links:** Further Textual Programming will be learnt in Year 9 and at GCSE. This provides students with a platform to build their problem-solving skills and understanding of computational thinking. **Why?** Students need an in-depth understanding of programming. This is a large proportion of the GCSE and essential learning for Paper 2, all skills will be transferrable across KS4. This also supports learning at KS4 not having to deliver for the first time but to revisit taught content. If the teacher feels it necessary, there will		**Previous Links:** Students will build upon E-Safety / Ethics that was learnt in year 7 by broadening knowledge to scenarios which could affect them in work, school and leisure settings. **Future Links:** Students will experience breadth in the curriculum by exploring real life issues which could affect them in the future. **Why?** Elements of the ethical unit will also be explored within Ethics at KS4 CS. This also links to the previous topic identifying risks with networks and technology.	

			be an option to use Small Basic for the first few lessons before moving onto Python Programming / continuing with visual programming.	
	Assessment	KS3 Assessment strategy - Computer Science.docx Students will sit a formative assessment at the end of each unit of work. Scores will be recorded centrally and will be used to inform future teaching. Students class teacher will mark these and provide individual and whole class feedback. Some of the formative assessments will have a practical element due to the nature of the subject. Students will sit three summative assessments (data drop points), the class teacher will again provide individual and whole class feedback, offering verbal improvements to the classroom. As part of all lessons at KS3, students will have a review task where they will review their learning from that lesson.		
	Homework	Students will be set a piece of homework per half term on the topic they have been studying. They will be able to take their exercise books home to be able to complete this homework. This homework will be used to assess students learning and understanding of their knowledge and skills and will provide a revision resource for formative and summative assessments. Computer Science Homework Policy.docx		

Year 9 Curriculum Map

YEAR 9		AUTUMN		SPRING		SUMMER	
Year 9	**Theme**	**Computer Systems**		**Python Programming**		**ICT Skills (ICT Skills)**	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• Year 7/8 Knowledge • Hardware (Inside the Computer – focus on CPU) • Accessibility Devices	• Practical application examples to understand purpose of given devices.	• Year 8 Programming Knowledge • Operators • Types of Loops • Lists • Random Function	• Creation of textual programs in Python using the following techniques: ○ Operators (mathematical)	• Structure of Spreadsheets • Formulas • Graphs • Conditional Formatting • Pivot Tables	• Creation of formulas – basic and advanced • Creation of graphs • Application of conditional

		• Storage Devices • RAM and ROM • Application and System Software • Operating Systems		• Turtle Graphics • Debugging	○ Loops (for / while) ○ Lists (arrays) ○ Functions (random) ○ Turtle Graphics	• Bitmap and Vector Images	formatting to data • Creation of a pivot table • Manipulating vector images to create logos • Manipulating bitmap images using photo editing skills.
	Texts to be studied	**What is the purpose of the CPU? - The CPU and the fetch-execute cycle - KS3 Computer Science Revision - BBC Bitesize**		**Errors and documenting code - Writing error-free code - KS3 Computer Science Revision - BBC Bitesize**		**How spreadsheets work - Spreadsheets - KS3 ICT Revision - BBC Bitesize**	
	Rationale	**Previous Links:** Students have learnt the purpose of Computer Systems and how they communicate internally and externally in year 7/8, this will be built upon and developed. **Future Links:** Computer Systems is an essential part of the KS4 NC and will be covered in further depth within the GCSE Specification (1.1). **Why?** All skills being learnt are transferrable across the curriculum and beyond if the students choose to study at A-Level.		**Previous Links:** Students will revisit Textual based programming learnt in the Spring Term of Year 8 and develop this into more advanced techniques. Students can embed their logical thinking skills that they have developed in Year 7/8. **Future Links:** Students will continue to develop their programming knowledge at KS4 and will require these skills as they are a huge part of the course, particularly Section B of the Programming Paper. **Why?** Students need a broad understanding of mathematics and logical thinking		**Previous Links:** Students will develop their ICT skills in Excel which they learnt in Year 7 and utilised within other activities. Students will also develop their understanding of bitmap and vector images. **Future Links:** Practice with further ICT software applications will support the students see similarities and develop confidence across the curriculum. **Why?** Students will experience skills with different software packages that they can use in future ICT courses such as the Digital IT BTEC which is offered in	

				skills to access computer science. Providing these skills early in the curriculum planning will allow them to be embedded, section B is also the improvement area of the GCSE which needs focus within the school.		school and potential career choices for the future	
	Theme	**Introduction to Business Studies**		**Algorithm Design**		**ICT Skills (App Design)**	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• Risk and Rewards • Entrepreneur • Market Mapping • Sole Traders and Partnerships • The Marketing Mix • Revenue, Cost and Profit	• Creation of market maps for given businesses • Calculating of revenue, profits and costs.	• Flowchart Shapes	• Creation of flowcharts for a given scenario. • Link the flowchart to programming techniques, e.g. OUTPUT to print	• App Design • Structure of Apps • User Interface • User Experience • App Functionality • Java Script Programming Language features.	• Design of logo to meet user experience needs • Application of JavaScript Programming.
	Texts to be studied	**The concept of risk and reward - The role of business enterprise and entrepreneurship - OCR - GCSE Business Revision - OCR - BBC Bitesize**		**What is an algorithm? - Algorithms - KS3 Computer Science Revision - BBC Bitesize**		**How do you make a good app? - BBC Bitesize**	
	Rationale	**Previous Links:** Some students may have some knowledge from their own personal knowledge or watching the news but have never been taught these concepts before. **Future Links:**		**Previous Links:** Students can embed their logical thinking skills that they have developed in Year 7/8. **Future Links:** Students will continue to develop their programming knowledge at KS4 and will require these skills as they are a		**Previous Links:** Students have explored visual and textual programming in Year 7/8/9 which will be revisited here as a combined language. This allows all students in each set to be able to access the scheme of learning and can personalise their own designs.	

		Business Studies will be explored by some students at KS4, all topics being taught here will feature within this course. **Why?** Students will get to experience a variety of topics that they may explore at Business Studies. This is a subject which students have no prior knowledge of and therefore will make more informed choices within their options. This must be placed here so it takes place before the options are chosen.	huge part of the course, particularly Section B of the Programming Paper. **Why?** Students need a broad understanding of mathematics and logical thinking skills to access computer science. Providing these skills early in the curriculum planning will allow them to be embedded, section B is also the improvement area of the GCSE which needs focus within the school. Students also need to be able to apply computational thinking to the design of algorithms or searching / sorting algorithms at KS4. This learning acts as a foundation for the GCSE specification.	**Future Links:** Students studying Computer Science will utilise the logical thinking and programming skills that they have developed. The project nature of the scheme of learning will also support students studying the BTEC Digital IT who will have to manage time and develop a range of products. **Why?** Having this topic here grips students enthusiasm entering Year 9 where they may be considering not continuing with the subject yet provides programming skills for the students continuing with Computer Science.
	Assessment	KS3 Assessment strategy - Computer Science.docx Students will sit a formative assessment at the end of each unit of work. Scores will be recorded centrally and will be used to inform future teaching. Students class teacher will mark these and provide individual and whole class feedback. Some of the formative assessments will have a practical element due to the nature of the subject. Students will sit three summative assessments (data drop points), the class teacher will again provide individual and whole class feedback, offering verbal improvements to the classroom. As part of all lessons at KS3, students will have a review task where they will review their learning from that lesson.		
	Homework	Students will be set a piece of homework per half term on the topic they have been studying. They will be able to take their exercise books home to be able to complete this homework. This homework will be used to assess students learning and understanding of their knowledge and skills and will provide a revision resource for formative and summative assessments. Computer Science Homework Policy.docx		

Year 10 Curriculum Map

YEAR 10	AUTUMN	SPRING	SUMMER

St Cuthbert's RC High School
Curriculum Map – Computer Science

Year 10	**Theme**	**System Architecture**		**Computer Networks**		**Algorithms**	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• The fetch-decode-execute cycle • CPU components • Von Neumann architecture • CPU Performance • Embedded Systems	• Application of knowledge to examples of embedded systems. • Knowledge of how the data flows through the Von Neumann Architecture.	• Types of Networks • Performance of Networks • Network Hardware • Internet (DNS, Hosting, Cloud) • Network Topologies • Wired and Wireless Connections • IP and MAC Addressing • Standards • Protocols • Layers	• Real world examples of networks. • Application of learning of networks to given scenarios e.g. a business • Creation of IP and MAC Addresses	• Computational Thinking • Structure Diagrams • Pseudocode • Flowchart • Trace Tables • Searching Algorithms • Sorting Algorithms	• Producing structure diagrams • Producing pseudocode and flowcharts • Producing trace tables • Carrying out searching algorithms for a given data set • Carrying our sorting algorithms for a given data set
	Texts to be studied	The architecture of the Central Processing Unit (CPU) – Systems architecture – OCR – GCSE Computer Science Revision – OCR – BBC Bitesize		Networks – Computer networks and topologies – OCR – GCSE Computer Science Revision – OCR – BBC Bitesize Modes of connection – Wired and wireless networks, protocols and layers – OCR – GCSE Computer Science Revision – OCR – BBC Bitesize		Principles of computational thinking – Computational thinking – OCR – GCSE Computer Science Revision – OCR – BBC Bitesize Algorithm production – Designing, creating and refining algorithms – OCR – GCSE Computer Science Revision – OCR – BBC Bitesize Standard search algorithms – Searching and sorting algorithms –	

				OCR – GCSE Computer Science Revision – OCR – BBC Bitesize
	Rationale	**Previous Links:** Students have learnt the purpose of parts of the computer, such as RAM, including further detail of the CPU in Y9. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Both units are included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to System Architecture to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.	**Previous Links:** Students were given a platform of understanding in Y8 about Networks. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Networks are included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to Networking to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.	**Previous Links:** Algorithm Design (Flowcharts) was studied during Y9 Spring Term. **Future Links:** The understanding of programming will provide them with logical thinking skills to be applied in a wide range of context. It will also support them for the context of Translators and Robust Programming. Learning will be revisited within Y11 and prior to their mocks to embed topics. Both units are included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to Algorithms, Computational Thinking and Programming Techniques to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification. Students will complete their Mock Examinations during this term; this will allow planning to be made for Y11 to ensure all learners receive the support required and plug the gaps in learning they may have.

St Cuthbert's RC High School
Curriculum Map – Computer Science

	Theme	Memory, Storage and Data Representation		Network Security		Programming Techniques	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• Primary Storage • RAM and ROM • Virtual Memory • Secondary Storage • Types of Storage • Characteristics of Storage • Units of data Storage • Binary Numbers • Denary Numbers • Hexadecimal Numbers • Character Representation • ASCII and Unicode • Image Representation • Metadata, Colour Depth and Resolution • Sound Representation	• Conversion of Number Systems (binary, denary and hexadecimal) • Binary addition • Binary shifts • Converting between units of data	• Malware • Social Engineering • Forms of Attack • SQL injections • Prevention Methods including physical security	• Application of learning of networks to given scenarios e.g. a business	• Variables, Constants, Operators, Inputs, Outputs and Assignments • Programming Constructs • Arithmetic Operators • Boolean Operators • Data Types • String Manipulation • File Handling Operations • SQL • Arrays • Sub Programs • Random Generation	• Creation of programs in a textual language (Python) o Input statements o Print statements o Variable / constant assignments o Use of Boolean, comparison and mathematical operators o Casting of data types o Applying string manipulation o Producing outputs to a file / reading from a file o Creation of SQL statements

		• Sampling, Sample Rate/interval, Bit Depth • Compression					○ Producing lists (array) ○ Creation of functions and procedures ○ Utilising libraries.
	Texts to be studied	Primary storage - Memory and storage - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize Units of data - Units and data representation - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize		Forms of attack - Network security - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize		Variables and constants - Programming fundamentals - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize The use of basic string manipulation - Programming techniques - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize	
	Rationale	**Previous Links:** Students have learnt how data is represented in Y8 focusing on text, images and sound. They have also learnt how to convert numbers from binary to denary. In Y7 they are introduced to storage types and capacity (e.g. bytes) which is referenced throughout KS3. **Future Links:** The concepts learnt can be transferred to Paper 2 in some instances, e.g. creating a program to complete data conversions. Knowledge of Binary will support their introduction to Logic Gates. Learning will be revisited within Year 11 and prior to their mocks to embed topics.		**Previous Links:** Students have learnt the dangers associated with Networks. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Network Security is included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to Network Security to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.		**Previous Links:** Students were given a platform of understanding in Textual Based Programming in Y8/9 after focusing on Visual Based Programming in Y7. **Future Links:** The understanding of programming will provide them with logical thinking skills to be applied in a wide range of context. It will also support them for the context of Translators and Robust Programming. Learning will be revisited within Y11 and prior to their mocks to embed topics. Both units are included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to Algorithms, Computational Thinking and	

		Both units are included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to Memory, Storage and Data Representation to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.		Programming Techniques to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification. Students will complete their Mock Examinations during this term; this will allow planning to be made for Y11 to ensure all learners receive the support required and plug the gaps in learning they may have.
	Assessment	• There should be a large amount of exam question practice within the lessons, ideally each lesson after learning the content the students need, they should be shown how to link this to the exam to address the bigger picture. • At the end of each scheme of work, students will be expected to complete a formative assessment, this is formally marked by the teacher and a grade is given for this piece of work. Whole class feedback will be given to the students which links to misconceptions. All results will be centrally tracked which enables the teacher to deliver material to address any gaps the students may need. • At three points of the year, students will be expected to complete a summative assessment, for the first data drop this will be an average of the end of unit tests completed so far, with reasonable adjustments due to the difficulty of topics. For the second data drop an assessment will be produced which covers all knowledge and skills students have learnt so far. For the third data drop a formal mock will be completed within the hall which covers the entirety of Year 10 content.		
	Homework	Students should be set exam questions fortnightly, that supports the teacher timetable to be able to set, receive, mark and track homework. The teacher may decide to mark these individually or may choose to mark these within the lessons with the students to provide feedback. These exam questions should link to the students current learning or may be used to revisit past topics. Computer Science Homework Policy.docx		

Year 11 Curriculum Map

St Cuthbert's RC High School
Curriculum Map – Computer Science

YEAR 11		AUTUMN		SPRING		SUMMER	
Year 11	Theme	Producing Robust Programs		System Software		Revision	
	Knowledge	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**	**Substantive Knowledge**	**Disciplinary Knowledge**
		• Defensive Design • Input validation • Maintainability • Purpose of Testing • Types of Testing • Syntax and Logic Errors • Test Data • Refining Algorithms	• Choosing and applying test data • Producing test tables • Finding and correcting syntax and logic errors	• Functionality of Operating Systems • User Interfaces • Memory and Peripheral Management • User and File Management • Utility Software • Encryption • Defragmentation • Compression	• Application of given example to a function of the operating system. • Application of scenario e.g. defragmentation.	• Retrieval of knowledge from all units.	• Application of learning to given scenarios for all topics.
	Texts to be studied	Defensive design considerations - Producing robust programs - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize		Systems software - Systems software - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize		**Knowledge Organisers** **Document "Read/Listen/Watch"** **CGP Textbook**	
	Rationale	**Previous Links:** Students should revisit the learning from Year 10 using a sequence of Mastery Sessions in Lessons due to the break of the Summer Holidays. Students have some experience of robust programming from their experience with Textual Programming, the knowledge will be familiar and transferrable but using more detailed terminology.		**Previous Links:** Students in Y9 have started to explore the purpose of an Operating System, and have looked at the range of User Interfaces, across KS3 the difference between application software and system software is referenced. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Unit is included within A-Level Computer Science.		**Previous Links:** Students will be revisiting all taught aspects of KS4 Computer Science. **Future Links:** Units are included within A-Level Computer Science. **Why?** Revision is essential at this stage of the curriculum to provide the students with the support they require before sitting the final	

<table>
<tr><td></td><td></td><td colspan="2">Future Links:
Learning will be revisited within Year 11 and prior to their mocks to embed topics. Unit is included within A-Level Computer Science
Why?
Students experience a breadth of learning linked to Producing Robust Programs to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.</td><td colspan="2">Why?
Students experience a breadth of learning linked to System Software to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.</td><td colspan="2">examination. Students can then decide to use this GCSE in future study including A-Level Courses, vocational courses and eventually through to University Degree Level Courses.</td></tr>
<tr><td></td><td>Theme</td><td colspan="2">Boolean Logic
Programming Languages</td><td colspan="2">Ethics / Revision</td><td colspan="2">Revision / Exam</td></tr>
<tr><td></td><td>Knowledge</td><td>Substantive Knowledge</td><td>Disciplinary Knowledge</td><td>Substantive Knowledge</td><td>Disciplinary Knowledge</td><td>Substantive Knowledge</td><td>Disciplinary Knowledge</td></tr>
<tr><td></td><td></td><td>• AND, OR and NOT Logic Gates
• Truth Tables
• High-Level and Low-Level Languages
• Purpose of translators
• Compiler and Interpreter
• IDE</td><td>• Producing Logic gate diagrams
• Producing truth tables
• Practical use of an IDE</td><td>• Ethical Issues
• Legal Issues
• Cultural Issues
• Environmental Issues
• Privacy Issues
• The Data Protection Act
• Computer Misuse Act
• Copyright</td><td>• Application of given example to a law or environmental issue.
• Extended writing giving opinions on a particular statement surrounding ethics.</td><td>• Retrieval of knowledge from all units.</td><td>Application of learning to given scenarios for all topics.</td></tr>
</table>

				• Software licences			
	Texts to be studied	[Why data is represented in binary form - Boolean logic - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize] [High level languages - Programming languages and Integrated Development Environments - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize]		[Impacts of digital technology on wider society - Ethical, legal and environmental impacts of digital technology - OCR - GCSE Computer Science Revision - OCR - BBC Bitesize]		**Knowledge Organisers** **Document "Read/Listen/Watch"** **CGP Textbook**	
	Rationale	**Previous Links:** Students have experienced Boolean logic terminology throughout programming at KS3/4. Students have had practical experience of translators and using an IDE but have not experienced the theoretical knowledge which links to the exam paper. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Both units are included within A-Level Computer Science **Why?** Students experience a breadth of learning linked to Translators and Logic Gates to secure transferrable skills which will be revisited in preparation for their Computer		**Previous Links:** Students in Y7/8 have learnt topics related to E-Safety and explored wider ethical/legal issues that surround Computing. They will be familiar with names of legislation and environmental risks. **Future Links:** Learning will be revisited within Year 11 and prior to their mocks to embed topics. Unit is included within A-Level Computer Science. **Why?** Students experience a breadth of learning linked to ethics to secure transferrable skills which will be revisited in preparation for their Computer Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.		**Previous Links:** Students will be revisiting all taught aspects of KS4 Computer Science. **Future Links:** Units are included within A-Level Computer Science. **Why?** Revision is essential at this stage of the curriculum to provide the students with the support they require before sitting the final examination. Students can then decide to use this GCSE in future study including A-Level Courses, vocational courses and eventually through to University Degree Level Courses.	

		Science examination. This will also be developed if students opt for Post 16 education in Computer Science. It is an essential part of the J277 Computer Science specification.		
	Assessment	• There should be a large amount of exam question practice within the lessons, ideally each lesson after learning the content the students need, they should be shown how to link this to the exam to address the bigger picture. • At the end of each scheme of work, students will be expected to complete a formative assessment, this is formally marked by the teacher and a grade is given for this piece of work. Whole class feedback will be given to the students which links to misconceptions. All results will be centrally tracked which enables the teacher to deliver material to address any gaps the students may need. • At two points of the year, students will be expected to complete a summative assessment, for the first data drop this will be a mock exam of two papers, paper two will be given full (the more challenging paper), paper one will be given with the omission of two topics. This then gives a realistic grade as whilst there is content missing the more challenging content has been assessed. The second data drop will then consist of paper one and paper two with the grade boundaries from that year being used.		
	Homework	Students should be set exam questions fortnightly, that supports the teacher timetable to be able to set, receive, mark and track homework. The teacher may decide to mark these individually or may choose to mark these within the lessons with the students to provide feedback. These exam questions should link to the students current learning or may be used to revisit past topics. This may be adapted to suitable revision related to the individual class as time progresses. Computer Science Homework Policy.docx		

Catholic Social Teaching	**Preparing for Life in Modern Britain**
In all areas of the curriculum careers are referenced. (Option for the Poor and Vulnerable) Year 7: Students develop Email Skills (Dignity of the human person), Students look at their digital footprints, cyberbullying, social networks and video games (Dignity of the human person, Dignity of Work, Rights and Responsibilities and Solidarity and the Common Good), Students look at Robotics / AI, Laws, Health and Safety (Dignity of the Human Person, Dignity of Work and	Students are encouraged in all aspects of the classroom to have mutual respect for others, particularly when giving their viewpoint and answers. Teachers should be respectful to their answers and not discourage engagement. Year 7: Students are encouraged to share their viewpoints and have detailed discussion particularly within the E-Safety unit of work (democracy). Discussion of other beliefs and tolerance of

Solidarity and the Common Good) Students also explore environmental issues (Stewardship). Year 8: Students study topics including Spam, Phishing, Hackers, Network Recovery and Real / Fake Information (Dignity of the Human Person, Dignity of Work and Solidarity of the Common Good) Year 9: Students explore video / photo editing which links to the Copyright Act (Rights and Responsibilities and Dignity of the Human Person) Year 10: Students develop understanding of Network Security Threats (Dignity of the Human Person and Rights and Responsibilities). Year 11: Students complete a unit of work on Ethics, Legal, Cultural and Environmental Issues (Stewardship, Rights and Responsibilities, Solidarity and the Common Good and Dignity of the Human Person) 	cultures is demonstrated within the video games lesson, how there may be differences in ethical views. Within the Ethics unit, students explore different laws (rule of law) in relation to technology. Year 8: Students are encouraged to share their viewpoints and have detailed discussion particularly within Term 3 (democracy). Discussion of other beliefs and tolerance of other cultures is demonstrated within the ethics unit. Year 9: Mutual respect must be established in the classroom to ensure that no app design is deemed offensive and everything included within the app design is age range appropriate. Year 11: Students discuss their viewpoints in relation to legal, cultural, environmental and ethical issues.
Careers Careers have been references for each individual unit at KS3 and KS4 for reference within students learning. Several activities will also link to careers directly and areas related to the field. Whole School Events such as Careers Day/Week will also play a factor into the focus that is put into this section. All KS4 Lessons have example careers within the Teacher PowerPoint: 	**Skills for Life** Year 7: ICT Skills within HT1 is essential for building ICT competency for all areas of life in leisure and in work. Many E-Safety topics cross over with the curriculum in Skills for Life due to social media and Technology being such a huge impact in everyday life. Programming provides students with logical thinking and application skills. Year 8: Many topics discussed within the ethics unit of work crosses over with Skills for Life. Programming provides students with logical thinking and application skills. Year 9:

	ICT Skills is essential for building ICT competency for all areas of life in leisure and in work. Programming provides students with logical thinking and application skills. KS4: Students are gaining logical thinking and application skills through all units of work. Students are also gaining practice use of ICT applications using Microsoft Packages which they will be able to apply to future careers and job roles.

Cultural Capital and Enrichment Opportunities

KS3

Investigate 2025/2026 of a trip related to technology. In the past students have completed trips to Universities to complete technology exploration days / gaming days, also had visitors into school from various companies to explore these niches.

Coding Club to run after school to promote love of programming / robotics.

KS4:

Investigate 2025/2026 of a trip related to technology. E.g. Bletchley Park or a Gaming Course at University. Explore this year a revision course towards the end of the Year with other schools.

Year 7:

Discussion of topics in E-Safety/Ethics allow students to explore different viewpoints and cultures. Students complete a PowerPoint "about me", which enables students to start talking about their lifestyle and interest to other students in the group. Programming allows students to embrace their interests, having free scope in the game design element they can apply it to their culture.

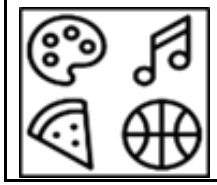
Year 8:

Programming allows students to embrace their interests, they have further freedom around the web design and creating small programs which are influenced by their current interests and hobbies, e.g. typing tests. Students explore hackers in Ethical issues to show the different skill sets and intentions that hackers may have.

Year 9:

Programming allows students to embrace their interests; they have further freedom when creating programs which are influenced by their current interests and hobbies. Flowchart design is centred around general household activities. Exploring further ICT software packages allows students to gain ideas into how lots of roles incorporate together and future hobbies / careers.

KS4:

St Cuthbert's RC High School
Curriculum Map – Computer Science

Programming allows some students to embrace their interests as they may engage with this at home. Scenarios will always be relatable so students can see how this impacts their day-to-day life.