









## St Paul's Academy

### ICT Curriculum Overview

#### Why We Teach ICT | Computer Science at St Paul's Academy




The ICT Curriculum has been designed to enable every student at St Paul's to learn and gain fundamental knowledge of digital communication technology.

Our aim is for all students to become masters of technology and enhance their learning across all subjects whilst at school and thereafter by;

-  How to stay safe while using technology within the online world.
-  Identifying how computers work.
-  How computers are programmed.
-  Utilising specialist software application to present data.
-  Communicating and collaborating within the digital world.
-  Applying logic and sequence to problem solve.



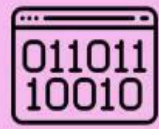

#### School Values | Career Links

Our rich ICT curriculum considers the 'global impact of digital literacy and competency in a rapidly changing world' [the school run; 2022] We equip our students with digital competency at all levels to successfully explore opportunities available to them. These are;

-  Employability skills through programming at KS3 | KS4
-  Linking the curriculum to careers | Computing | Engineering | IT | Data
-  KS4 pathways: BTEC DIT Tech Award II to Level III at Sixth form or College Computer Science to A-Level Computer Science


#### Disciplinary Knowledge

Our students will develop disciplinary knowledge within the following categories to fully apply the substantive knowledge

<b>Digital Literacy</b>	
<b>Information Technology</b>	
<b>Computer Science</b>	
<b>Good Online Practices</b>	

#### Substantive Knowledge

Our learning is mapped with a sequence of substantive knowledge from information communication technology and computer science to enable students to build concepts through KS3 and KS4 with four main ideas

<b>E-Safety</b>	
<b>Technology</b>	
<b>Programming</b>	
<b>Data</b>	

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ICT Key Stage 3 Curriculum Map – Topics by Term

<i>SK Themes and colours</i>	SK1 Programming	SK2 E-Safety	SK3 Technology	SK4 Data
<i>DK Big Ideas and colours</i>	DK1 Digital Literacy	DK2 Information Technology	DK3 Computer Science	DK4 Good Online Practices

KS3	Autumn 1				Autumn 2				Spring 1				Spring 2				Summer 1				Summer 2									
Year 7	<b>Theme:</b> Using School Systems & Data Representation				<b>Theme:</b> Understanding Computers				<b>Theme:</b> Networks & E-Safety				<b>Theme:</b> Graphic Design & Copyright				<b>Theme:</b> Algorithms & Computational Thinking				<b>Theme:</b> Scratch Game Development									
	<u>Outline:</u> Intro to file organisation, safety, and data basics.				<u>Outline:</u> Hardware, input/output devices, storage, and software				<u>Outline:</u> Learn about computer networks and internet safety.				<u>Outline:</u> Use graphics software and understand copyright issues				<u>Outline:</u> Introduction to algorithmic thinking with flowcharts.				<u>Outline:</u> Design and code interactive games in Scratch.									
	<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Hardware</li> <li>● Software</li> <li>● Files</li> <li>● Password</li> <li>● Data</li> </ul>				<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● CPU</li> <li>● Input</li> <li>● Memory</li> <li>● OS</li> <li>● Utility</li> </ul>				<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Network</li> <li>● Browser</li> <li>● E-Safety</li> <li>● Cyberbullying</li> </ul>				<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Design</li> <li>● Image</li> <li>● Photoshop</li> <li>● Copyright</li> </ul>				<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Algorithm</li> <li>● Sequence</li> <li>● Loop</li> <li>● Pseudocode</li> </ul>				<u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Sprite</li> <li>● Loop</li> <li>● Condition</li> <li>● Variable</li> </ul>									
	SK			SK3	SK4					SK2					SK3					SK1					SK1					
	DK	DK1					DK3					DK4			DK2						DK2						DK2			
Year 8	<b>Theme:</b> Computational Thinking: Turtle Programming				<b>Theme:</b> Networking Basics				<b>Theme:</b> Data Representation				<b>Theme:</b> Programming: Text-based Game (Python)				<b>Theme:</b> Computers: Hardware & Software				<b>Theme:</b> Using Tech Safety and Impact of Technology									
	<u>Outline:</u> Use loops, selection, parameters, and lists in				<u>Outline:</u> Understand networks, domains, IP, protocols, security, and how to stay				<u>Outline:</u> Explore how computers represent text, numbers, images, and sound				<u>Outline:</u> Code simple games using text-based Python: loops				<u>Outline:</u> Examine the role of operating systems, application software,				<u>Outline:</u> Discuss safe use of tech, social impact, ethical									

	<p>Turtle. Learn abstraction, decomposition, debugging.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Iteration</li> <li>Selection</li> <li>Parameters</li> <li>List</li> <li>Function</li> <li>Debugging</li> </ul>	<p>safe online</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>IP address</li> <li>domain</li> <li>browser</li> <li>VoIP</li> <li>Packet</li> <li>Protocol</li> <li>Firewall</li> </ul>	<p>using binary.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Binary</li> <li>Bit</li> <li>Byte</li> <li>Character set</li> <li>Metadata</li> <li>Compression</li> </ul>	<p>decisions, variables.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Python</li> <li>Loop</li> <li>IF statement</li> <li>Print</li> <li>Input</li> <li>Variable</li> <li>Condition</li> </ul>	<p>and digital footprints.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>OS</li> <li>RAM</li> <li>ROM</li> <li>app software</li> <li>Hardware</li> <li>GUI</li> </ul>	<p>and responsible use of digital systems.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Online safety</li> <li>Cyberbullying</li> <li>Social Media</li> <li>Reporting</li> <li>Evaluation</li> </ul>
	SK SK1	SK2 SK3	SK4	SK1	SK3	SK2
	DK	DK3	DK4	DK3	DK1	DK4
Year 9	<p><b>Theme:</b> Text-based Programming (Python)</p> <p><u>Outline:</u> Learn Python basics: variables, input/output, calculations, conditionals.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Variable</li> <li>Input</li> <li>Print</li> <li>Syntax</li> <li>Integer</li> </ul>	<p><b>Theme:</b> Python Project Development</p> <p><u>Outline:</u> Further programming: loops, functions, logic, modular design.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>While</li> <li>For</li> <li>Function</li> <li>Parameter</li> </ul>	<p><b>Theme:</b> Introduction to Linux</p> <p><u>Outline:</u> Command-line file management, system navigatio, OS comparison</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Command line</li> <li>Directory</li> <li>Shell</li> <li>OS</li> </ul>	<p><b>Theme:</b> Artificial Intelligence</p> <p><u>Outline:</u> History, development and ethical issues of AI</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>AI</li> <li>Ethics</li> <li>Turing Test</li> <li>Algorithm</li> </ul>	<p><b>Theme:</b> Cryptography and Networks</p> <p><u>Outline:</u> Encryption methods, Caesar cipher, hashing, secure transmission.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Cipher</li> <li>Encryption</li> <li>Decryption</li> <li>Packet</li> </ul>	<p><b>Theme:</b> Data Representation &amp; Boolean Logic</p> <p><u>Outline:</u> Binary, logic gates, FDE cycle, Boolean operators, Cloud computing</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>Binary</li> <li>Logic gate</li> <li>FDE</li> <li>Truth Table</li> </ul>
	SK SK1	SK1	SK3	SK3	SK2	SK4
	DK	DK3	DK2	DK2	DK3	DK3

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ICT Key Stage 4 Curriculum Map – Topics by Term

<i>SK themes and colours</i>	SK1 Programming	SK2 E-Safety	SK3 Technology	SK4 Data
<i>DK Big Ideas and Colours</i>	DK1 Digital Literacy	DK2 Information Technology	DK3 Computer Science	DK4 Good Online Practices

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Year 10	<p><b>Theme:</b> Systems Architecture</p> <p><u>Outline:</u> CPU, Von-Neumann, ALU/CPU, fetch-decode-execute, performance factors</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● CPU</li> <li>● ALU</li> <li>● CU</li> <li>● Register</li> <li>● Cache</li> <li>● FDE</li> </ul>	<p><b>Theme:</b> Memory and Storage</p> <p><u>Outline:</u> RAM, ROM, virtual memory, storage media, cloud storage</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● RAM/ROM</li> <li>● SSD</li> <li>● HDD</li> <li>● Optical</li> <li>● Flash</li> </ul>	<p><b>Theme:</b> Networks and Protocols</p> <p><u>Outline:</u> Network types, topologies, protocols, IP/DNS, layers of communication</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● LAN</li> <li>● WAN</li> <li>● IP</li> <li>● DNS</li> <li>● HTTP</li> <li>● TCP/IP</li> </ul>	<p><b>Theme:</b> Network Security</p> <p><u>Outline:</u> Malware, attacks, protection, access control, secure passwords</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● Malware</li> <li>● Phishing</li> <li>● Firewall</li> <li>● Brute Force</li> <li>● Password</li> </ul>	<p><b>Theme:</b> Systems Software</p> <p><u>Outline:</u> OS functions, utility software, managing files, memory and processes.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● OS</li> <li>● Utility</li> <li>● Backup</li> <li>● Compression</li> <li>● Multitasking</li> </ul>	<p><b>Theme:</b> Legal, Ethical and Environmental Issues</p> <p><u>Outline:</u> Data Protection, CMA, copyright, social/environmental impacts of computing.</p> <p><u>Key Vocab:</u></p> <ul style="list-style-type: none"> <li>● GDPR</li> <li>● CMA</li> <li>● Copyright</li> <li>● Ethics</li> <li>● Sustainability</li> </ul>	
	<i>SK</i>	SK3	SK4	SK3	SK2	SK3	SK3
	<i>DK</i>	DK3	DK3	DK3	DK4	DK2	DK4

Year 11	<b>Theme:</b> Algorithms & Problem Solving  <u>Outline:</u> Sorting/searching algorithms, abstraction, decomposition, flowcharts, pseudocode  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Bubble sort</li> <li>● Merge sort</li> <li>● Binary search</li> <li>● Flowchart</li> </ul>			<b>Theme:</b> Programming Fundamentals  <u>Outline:</u> Variables, inputs/outputs, sequence, selection, iteration, data types.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Variable</li> <li>● Loop</li> <li>● Condition</li> <li>● Input</li> <li>● Output</li> <li>● Data type</li> </ul>			<b>Theme:</b> Robust programs & Boolean Logic  <u>Outline:</u> Defensive programming, validation, logic gates (AND, OR, NOT), testing strategies  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Syntax error</li> <li>● Validation</li> <li>● Logic gate</li> <li>● Test Plan</li> </ul>			<b>Theme:</b> Programming Languages and IDEs  <u>Outline:</u> Translators, compilers vs. interpreters, IDE features and their uses.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● IDE</li> <li>● Compiler</li> <li>● Interpreter</li> <li>● Runtime error</li> </ul>			Revision and Exam Preparation		
	SK	SK1		SK1		SK1		SK3							
	DK		DK3		DK3		DK3	DK2							



Year 11	<b>Theme:</b> Component 3A- Cyber Security  <u>Outline:</u> Learn about threats to digital systems, both internal and external, and their impacts.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Malware</li> <li>● Phishing</li> <li>● Social Engineering</li> <li>● Hacking</li> </ul>				<b>Theme:</b> Component 3B -Prevention and Policy  <u>Outline:</u> Explore security policies and how organisations prevent, manage, and respond to threats.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Access</li> <li>● Control</li> <li>● Backup</li> <li>● Encryption</li> <li>● Firewalls</li> </ul>				<b>Theme:</b> Component 3C Wider Implications  <u>Outline:</u> Understand the legal, environmental and ethical impacts of technology use.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● GDPR</li> <li>● CMA</li> <li>● Legislation</li> <li>● Net neutrality</li> <li>● Accessibility</li> </ul>				<b>Theme:</b> Component 3D- Communication and Preparation  <u>Outline:</u> Learn about vocational scenarios and revise for Component 3 exam.  <u>Key Vocab:</u> <ul style="list-style-type: none"> <li>● Scenario</li> <li>● Structure</li> <li>● Response</li> </ul>				Revision and Exam Preparation			
	SK		SK2			SK2				SK3				SK3						
	DK			DK4			DK4		DK1				DK1							