

KS3 Computing Overview

Topic	Autumn				Summer
	Digital Literacy	Understanding Computers	Block Programming - Scratch	Spreadsheets	Computer Networks
Key Learning Content	<ul style="list-style-type: none"> Understand social networks, personal data and privacy settings Understand and explain cyberbullying and how to report it Explain dangers to computers when online and how to avoid these Understand and explain surveillance, GPS and tracking 	<ul style="list-style-type: none"> Distinguish between hardware and software Identify Input, Output and Storage devices Understand how processor speed affects computation time Define a Bit, Byte, KB Name three types of optical storage device Review the history and development of communication Understand how modern communication and computing devices combine 	<ul style="list-style-type: none"> Relate computational abstractions and simple programming code to on-screen actions Design simple algorithms to solve problems Sequence instructions to make things happen Use variables in programming structures 	<ul style="list-style-type: none"> Identify columns, rows, cells, and cell references in spreadsheet software Use formatting techniques in a spreadsheet Use basic formulas with cell references to perform calculations in a spreadsheet Explain the difference between data and information Explain the difference between primary and secondary sources of data 	<ul style="list-style-type: none"> Define what a computer network is and explain how data is transmitted between computers across networks Define 'protocol' and provide examples of non-networking protocols List examples of the hardware necessary for connecting devices to networks

	<ul style="list-style-type: none"> • Look at different Computer Legislations • Be able to explain the difference between ethical and unethical computer misuse • Be able to discuss the use of ethical and unethical computer misuse 	<ul style="list-style-type: none"> • multiple technologies • Discuss the different ways and applications in which modern technology is used 	<ul style="list-style-type: none"> • Assemble code in procedural blocks • Modify a program to include selection • Create conditions that use comparison operators • Create conditions that use logic operators • Define iteration as a group of instructions that are repeatedly executed • Describe the need for 	<ul style="list-style-type: none"> • Create appropriate charts in a spreadsheet • Use the functions SUM, COUNTA, MAX, and MIN in a spreadsheet • Use a spreadsheet to sort and filter data • Use the functions AVERAGE, COUNTIF, and IF in a spreadsheet • Use conditional formatting in a spreadsheet 	<ul style="list-style-type: none"> • Compare wired to wireless connections • Define 'bandwidth' • Define what the internet is • Explain how data travels between computers across the internet • Describe key words such as 'protocols', 'packets', and 'addressing' • Explain the difference between the internet, its services, and the World Wide Web • Explain the term 'connectivity' as the capacity for connected
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			<p>iteration</p> <ul style="list-style-type: none"> Identify where count-controlled iteration can be used in a program Implement count-controlled iteration in a program Carry out simple tests to debug their project 		<p>devices ('Internet of Things')</p> <ul style="list-style-type: none"> Describe how internet-connected devices can affect me Describe components (servers, browsers, pages, HTTP and HTTPS protocols, etc.) and how they work together
National Curriculum Links	<ul style="list-style-type: none"> Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise 	<ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems Understand how instructions are stored and executed within a computer system; 	<ul style="list-style-type: none"> Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures (e.g. 	<ul style="list-style-type: none"> Design, use, and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems Undertake creative projects that involve 	<ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems

	<p>inappropriate content, contact and conduct and know how to report concerns.</p>	<p>understand how data of various types (including text, sounds, and pictures) can be represented and manipulated digitally, in the form of binary digits; be able to convert between binary and decimal, and perform simple binary arithmetic</p>	<p>lists, tables, or arrays); design and develop modular programs that use procedures or functions</p> <ul style="list-style-type: none"> Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem Understand simple Boolean logic (e.g. and, or, and not) 	<p>selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users</p>	
Assessment	<p>Written assessment 4 sections 15 marks per section 60 marks total</p>	<p>Online assessment 38 marks total</p>	<p>Online assessment 20 marks total</p>	<p>Practical assessment task</p>	<p>Online assessment 24 marks total</p>

Year 8

Topic	Autumn					Summer
	Digital Literacy	Networks	Python Programming	Developing for the Web	Graphics	
Key Learning Content	<ul style="list-style-type: none">Understand social networks, personal data and privacy settingsUnderstand and explain cyberbullying and how to report itExplain dangers to computers when online and how to avoid theseUnderstand and explain surveillance, GPS and trackingLook at different Computer LegislationsBe able to explain the difference	<ul style="list-style-type: none">Understand what the Internet and World Wide Web are and how they differUnderstand the different types of network media (cables)Identify different network topologies including:<ul style="list-style-type: none">Bus networkStar networkUnderstand how packet switching works and be able	<ul style="list-style-type: none">Describe what algorithms and programs are and how they differWrite simple Python programs that display messages, assign values to variables, and receive keyboard inputLocate and correct common syntax errors	<ul style="list-style-type: none">Describe what HTML isUse HTML to structure static web pagesModify HTML tags using inline styling to improve the appearance of web pagesDisplay images within a web pageApply HTML tags to	<ul style="list-style-type: none">Use tools to draw and modify shapesChange the position and rotation shapesExplain how z-order determines what is visibleUse tools to align and distribute	

	<ul style="list-style-type: none"> • Be able to discuss the use of ethical and unethical computer misuse 	<ul style="list-style-type: none"> • to simulate it to send information • Bandwidth and how it affects file transfer time • Understand the difference between LANs and WANs • Be able to give examples of each type of network • Know the hardware required to build a LAN • Understand the terms: <ul style="list-style-type: none"> ◦ Client-server model ◦ Peer to peer network ◦ Cloud computing 	<ul style="list-style-type: none"> • Use multi-branch selection (if, elif, else statements) to control the flow of program execution • Describe how iteration (while statements) controls the flow of program execution • Use iteration (while loops) to control the flow of program execution • Use variables as counters in iterative programs • Combine iteration and selection to 	<ul style="list-style-type: none"> • construct a web page structure from a provided design • Describe what CSS is • Use CSS to style static web pages • Assess the benefits of using CSS to style pages instead of in-line formatting • Describe what a search engine is • Explain how search engines ‘crawl’ through the World Wide Web and 	<ul style="list-style-type: none"> • objects to create uniformity • Explain how grouping can be used to work with several objects at once • Combine two shapes using union, intersection, and difference • Explain that vector graphics are made up of paths • Create and modify
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			<p>control the flow of program execution</p>	<p>how they select and rank results</p> <ul style="list-style-type: none"> • Analyse how search engines select and rank results when searches are made • Use search technologies effectively • Discuss the impact of search technologies and the issues that arise by the way they function and the way they are used • Create hyperlinks to allow users to 	<p>straight and curved paths</p> <ul style="list-style-type: none"> • Change shapes to paths and edit them • Choose a project and plan a design • Combine tools and techniques to create a vector image • Evaluate the project against its given purpose • Explain key differences between
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				<p>navigate between multiple web pages</p> <ul style="list-style-type: none"> Implement navigation to complete a functioning website 	<p>vector and bitmap images</p> <ul style="list-style-type: none"> Outline which image type best suits which uses Evaluate their image against a rubric
National Curriculum Links	<ul style="list-style-type: none"> Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns. 	<ul style="list-style-type: none"> Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems Understand a range of ways to use technology safely, respectfully, 	<ul style="list-style-type: none"> Use two or more programming languages, at least one of which is textual, to solve a variety of computational problems Understand several key algorithms that reflect computational 	<ul style="list-style-type: none"> Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability. 	<ul style="list-style-type: none"> Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve

		<p>responsibly and securely</p>	<p>thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem</p> <ul style="list-style-type: none"> Understand how instructions are stored and executed within a computer system Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems 		<p>challenging goals, including collecting and analysing data and meeting the needs of known users</p> <ul style="list-style-type: none"> Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability
Assessment	<p>Written assessment 4 sections 15 marks per section 60 marks total</p>	<p>Online assessment 40 marks total</p>	<p>Online assessment 40 marks total</p>	<p>Online assessment 14 marks total Practical assessment</p>	<p>Online assessment 16 marks Practical assessment –</p>

					Self assessed against Rubric
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Year 9	Autumn					Summer
	Topic	Digital Literacy	Artificial Intelligence	Cybersecurity	Animation	Python Programming
Key Learning Content	<ul style="list-style-type: none"> Understand social networks, personal data and privacy settings Understand and explain cyberbullying and how to report it Explain dangers to computers 	<ul style="list-style-type: none"> Understand the origin and uses of AI Understand how rules are used in AI decision making Understand what ethics is Consider some simple ethical 	<ul style="list-style-type: none"> Explain the difference between data and information Identify what happens to data entered online Explain the need for the Data Protection Act Recognise how human errors pose 	<ul style="list-style-type: none"> Add, delete, and move objects Scale and rotate objects Use a material to add colour to objects Add, move, and delete keyframes to 	<ul style="list-style-type: none"> Use data types correctly and convert between them when necessary Write programs that use a loop to repeat a section of code Write programs that use lists (known as 'arrays') 	

	<ul style="list-style-type: none"> when online and how to avoid these Understand and explain surveillance, GPS and tracking Look at different Computer Legislations Be able to explain the difference between ethical and unethical computer misuse Be able to discuss the use of ethical and unethical computer misuse 	<p>hypothetical problems</p> <ul style="list-style-type: none"> Understand how intelligence can be measured in humans and computers Know what the Turing test is 	<p>security risks to data</p> <ul style="list-style-type: none"> Implement strategies to minimise the risk of data being compromised through human error Define hacking in the context of cyber security Explain how a DDoS attack can impact users of online services Identify strategies to reduce the chance of a brute force attack being successful Explain the need for the Computer Misuse Act List the common malware threats Question how malicious bots can have an impact on societal issues 	<p>make basic animations</p> <ul style="list-style-type: none"> Play, pause, and move through the animation using the timeline Create useful names for objects Join multiple objects together using parenting Use edit mode and extrude Use loop cut and face editing Apply different colours to different parts of the same model Add and edit set lighting Set up the camera Compare 	<p>in some languages)</p> <ul style="list-style-type: none"> Create and use a function with or without parameters Explain the advantages of functions for reusable sections of program code Find and debug syntax errors Look at a given section of code and describe its function
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			<ul style="list-style-type: none"> Compare security threats against probability and the potential impact to organisations Explain how networks can be protected from common security threats 	<ul style="list-style-type: none"> different render modes Create a 3–10 second animation Render out the animation 	
National Curriculum Links	<ul style="list-style-type: none"> Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns. 	<ul style="list-style-type: none"> Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns. 	<ul style="list-style-type: none"> Understand a range of ways to use technology safely, respectfully, responsibly, and securely, including protecting their online identity and privacy; recognise inappropriate content, contact, and conduct, and know how to report concerns 	<ul style="list-style-type: none"> Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability 	<ul style="list-style-type: none"> Use two or more programming languages, one of which is textual, to solve a variety of computational problems; make appropriate use of data structures; design and develop modular programs that use procedures and functions 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.
Assessment	Written assessment 4 sections 15 marks per section 60 marks total	Online assessment 21 marks total	Online assessment 15 marks total	Practical assessment – Self assessed against Rubric	Practical assessment – Assessed against Rubric