

Computing KS3 Curriculum Overview

By the end of KS3, students should:

KNOW	Students to create, communicate and solve problems using technology. This can be achieved by students knowing, remembering, and then applying rich knowledge across the three pillars of computing: Computer Science, Information Technology and Digital Literacy. The knowledge and skills embedded into the curriculum allows students to innovate, gain confidence and build strategies for creativity and problem solving, enabling them to communicate effectively in a digital world.
DO	Students to become competent in their use of computing topics within the pillars of digital literacy, computer science and information technology.
APPRECIATE	Students to appreciate the wider area of ICT and the ever changing effect ICT can have on daily life and the wider world.

Curriculum Coverage:

	Topic	Sub Topic	Coverage
Year 7	Introduction to Networks	Logging into the system	- Logging on to the school system - Using TEAMS, SharePoint and Citrix - Sending emails - Common health and safety problems associated with computer use.
		Hardware and software	- Difference between hardware and software - Difference between inputs and outputs - Memory and storage
		Networks	- What a network is - Why networks are used - Advantages and disadvantages of using a network
	Online safety	Introduction to online safety	- Safety concerns about being online - Making a positive online reputation
		Online Reputation	Digital footprints
		Credibility and fake news	- Checking digital content for creditability/ trustworthiness - Techniques to check if a source is trustworthy
		Right to privacy and The Bubble	- Legal rights to privacy within the UK - Phenomenon of the filter bubble
	Modelling	What is a spreadsheet?	- What a spreadsheet is used for - Features of a spreadsheet
		How to use basic formulas	Using SUM, MAX, MIN and AVERAGE
		How to create graphs	- Creating simple bar, line and pie charts - Using appropriate titles, axis names and legends
		How to sort and filter	- Sort data in ascending and descending order - Filter data for a specific scenario
	Computational Thinking	What is logical thinking?	Use and understand the logic gates AND, OR and NOT
		What is algorithmic thinking?	- Define algorithms - Understand when sequence, selection and iteration are used
		What is abstraction, decomposition and pattern-recognition?	Understand the key computational terms and how these are applied
	Scratch	What is logic and sequencing in programming?	Use script blocks to create a sequence
		How is selection used to write programs?	- Use control section in Scratch to create an ‘if’ scenario - Know how to ‘debug’
		How is iteration used to write programs?	Use a variety of loops in Scratch

Curriculum Coverage continued:			
	Topic	Sub Topic	Coverage
Year 8	Database	Understand key terms and the use of databases	- Fields - Records - Primary keys
		Be able to set up a relational database	- Use of relational databases - Purpose of a foreign key
		Set up queries	Use inbuilt features to create queries for a given scenario
	Cyber security	You and your data	Difference between data and information
		Social Engineering methods	- Shouldering - Phishing - Blagging - Name generator attack
		Different types of malware	- Virus - Worms - Trojan - Adware - Spyware - Ransomware
	Binary and Data Representation	Different units of information	- Bit - Nibble - Byte - Kilobyte - Megabyte - Gigabyte
		Difference between Binary and Decimal	- Base2 - Base10
		Converting Binary into Decimal and vice versa	- Methods to convert Base2 to Base10 - Methods to convert Base10 to Base2
		Addition in Binary	Learn the patterns in binary to add 3 binary numbers together
	Python	Write a simple programs to display a message	- Use the print function - Assign variables
		Use a relational operators to form logical expressions	Use if and elif statements to make a selection
		How iteration controls the flow of a program execution	Use for and while loops
	Graphics	Difference between a bitmap and Vector	- Bitmaps made up of pixels - Vectors made up of lines and shapes
		Calculate the representation of an image size	Formula to calculate image size and colour depth
		Manipulating Digital Images	Use different tools to manipulate images in graphic software

Curriculum Coverage continued:

	Topic	Sub Topic	Coverage
Year 9	Algorithms	What is a flow chart and how are they constructed?	Symbols that make up a flowchart
		Explain how data can be sorted	- Merge - Bubble sort
		Explain how data can be searched	- Binary search - Linear search
	Python	Counted Loops with Python Turtle	Use repetition to make programs more efficient
		Using procedures with Python Turtle	Define and call functions (subroutines)
		Using random with Python Turtle	Use inbuilt functions within Python to call upon a random item
	Modelling	How to use advanced functions	- V-look up - Count - Counta - What if
		Be able to set up macro and links	Create a macro to do an automated task, such as print
		Create Pivot Charts	Advanced chart creation
	Video Editing	Plan and create a video	- Identify Audience and purpose - Create a Mood board - Create a Mind map - Select appropriate assets
		Edit and Enhance video content	- Import and organise video, audio and image files - Add titles and text - Trim, split and arrange clips on a timeline - Export a video
		Evaluate and refine digital media products	- Review a video against its purpose - Rei9ne content based on feedback - Identify strengths and areas for improvement - Explain how media choices influence audience engagement
	AI	What is AI?	- Purpose of AI - Use of AI
		Ethics of AI	Consider some simple ethical hypothetical problems
		Turing tests and chatbots	How intelligence can be measured in humans and computers

The Wider KS3 Curriculum:

Competitions: Typing challenges

Homework expectations: Homework is set every other week using quizzes and keyword activities which will allow students time to consolidate skills and knowledge they have already covered in detail in lessons and so boosting the impact on their long term memory.

IT KS4 Curriculum Overview

By the end of KS4, students should:

KNOW	Students have that knowledge that underpins effective use of skills, process and attitudes in the IT sector such as how different user interfaces meet user needs, how organisations collect and use data to make decisions, virtual workplaces, cyber security and legal and ethical issues.
DO	Students to continue to develop an understanding of the 3 pillars of ICT allowing them to use software application effectively as well as understand the use of ICT in society.
APPRECIATE	Appreciate the impacts of digital technology to the individual and to wider society.

Curriculum Coverage:

	Topic	Sub Topic	Coverage
Year 10	Planning, creating and manipulating and storing images	Planning and designing an image	- Analyse requirements to a specified client brief and identify client success - Plan design (sketches and layouts) with annotations - Identify and select image source and identify key qualities of images and limitations of editing - Identify any copyright or intellectual property rights and reference source
		Creating and modifying an image using appropriate tools and techniques	- Compare file formats and fitness for purpose - Import, create and modify images uses standard and advanced tools - Select software according to image type, along with properties and canvas size based on output requirements
		Storing the image appropriately and outputting the final image in a format that is fit for purpose	- Store images using version control and appropriate file type - Output the final version in an optimised format - Test the file types electronically and digitally for fitness for purpose - Evaluate final product against success criteria, identifying possible improvements
	Planning, creating, modifying and using databases	Planning, creating, modifying and using databases	- Analyse requirements to a specified client brief and identify client success - Identify the entities within a specified brief and design - Give detailed justification for field types used and choice of validation rules applied to the field types
		Creating and modifying a database	- Create and add tables with appropriate fields, primary key, data types and effective validation rules and error messages - Add, edit and delete records - Link the tables using key fields and relationships and import the data from a given CSV file - Check and test the database to ensure it is error free and functions correctly
		Interrogating a database	- Create select queries, using a query builder including single table/single criteria; multiple tables/multiple criteria; wildcard; parameter, calculations - Produce reports from queries, with at least one report showing customisation for fitness of purpose
		Creating user interfaces	- Create effective data entry forms that simplify data entry and navigation, include relevant fields and accept data and validation - Enhance layout of the form to include an image for business purposes - Add features and controls that make the system user friendly and allow the user to navigate records, forms, queries and reports easily, visual basic (VB) and/or macro.
		Testing and evaluative a database	- Provide a test plan and select a range of test data including valid, extreme and erroneous data - Give detailed reasons for all testing methods - Give evidence for the testing carried out to test plan including evidence of test pass/fail - Evaluate the testing successes and failures and identify improvements.
	Planning, creating, modifying and using spreadsheets	Planning and designing a spreadsheet	- Analyse requirements to a specified client brief and identify client success - Design a spreadsheet structure including worksheets, navigation, formulae, tools and techniques to be applied.
		Creating and formatting a spreadsheet	- Import data from a CSV. File and enhance the layout and the format - Create a navigation menu and define a print area - Facilitate data entry through use of form controls, e.g., buttons, check box, drop-down lists, combo boxes, spinners, scroll bar
		Use of appropriate data formatting and adding suitable validation rules	- Use data formatting, conditional formatting and the date/time function - Use validation checks and messages - Facilitate data entry through use of validation form controls, e.g., drop-down lists, combo boxes, spinners, scroll ball
		Use of appropriate formulae and functions to meet set outcomes	- Use formulas with single operators and brackets to prioritise - Use complex functions such as IF and VLOOKUP along with macros to link native function - Use simple functions, such as SUM, COUNTA etc along with relative and absolute cell referencing
		Arranging, reducing and outputting data to help make decisions	- Use sorting on single and multiple items - Use filters - Create a chart/graph with appropriate title legend axis labels and formatting
		Modifying data and formulae to model 'what if' scenarios	Use ‘what if’ investigations to change data and formula
		Testing and evaluating spreadsheets	- Provide a test plan and select a range of test data including valid, extreme and erroneous data - Evaluate the testing successes and failures and identify improvements and suggest how to implement them - Use a test table, based on the success criteria, giving detailed reasons for test methods and evidence of testing being carried out

Curriculum Coverage continued:

	Topic	Sub Topic	Coverage
Year 10	Planning, creating and modifying an automated document	Planning and designing an automated document	- Analyse requirements to a specified client brief and identify client success - Design a standard document including location of place holders, formatting and features to be used.
		Creating an effectively structured data source and linking this to a standard document	- Create a standard and a source document - Create appropriately divided fields with data - Create a link between the data source and standard document
		Appropriately structuring the content of the standard document and inserting fields as required	- Insert appropriate fields: address line; subject; salutation/valediction; personalised content within document - Check accuracy: spelling; grammar; proofread - Add appropriate formatting and features: letterhead; watermark; autodate; alignment; set line spacing; justification; indexing; automatic fields; bullets; appropriate layout.
		Merging and outputting final documents	- Complete the merge and check accuracy - Check formatting following insertion of merged data - Output merged documents - Evaluate the document and identify improvements.
	Complete NEA		
Year 11	How IT can be used to fulfil the needs of organisations and individuals	Functionality of different hardware devices	- Computing, input, output and storage devices - Basic components and ports
		Functionality of different software	- System, Application and Utility software - Open source and communication software - Specialist and information handling software
		Services provided by IT	How each service improves efficiency/productivity for businesses and/or individual users
	How data and information is used and transferred	Why data must be fit for purpose	- The difference between data and information and the need for good quality data - Improvements in speed of access and increased storage along with the advantages and disadvantages of using information and communication technology for storing data - Benefits of encoding data and the reasons for doing it - File types, data compression and file properties
		How input data is checked for errors	- Methods of data capture with methods of validation and verification - Possible sources of error and techniques to overcome errors
		How data transfers over different types of network	- Difference between LANs and WANs and the purpose of protocols - Threats to data transfer - Network operations and topologies - Cloud computing Vs on house servers and emerging technologies - Devices within a network and how data is transferred
		Different types of connectivity	- Connection methods, along with Short, medium and long range wireless connections - Ethernet, USB, micro USB and USB C and other emerging technologies
	Legal, moral, ethical, cultural and environmental impacts of IT and the need for cybersecurity	Risks to information held on computers	- Accidental damage and unintended disclosure - Social engineering and emerging threats - Malicious software and hacking
		The impact of data loss, theft or manipulation on individuals and businesses	- Financial, Moral and Legal implications and data manipulations - Loss of service, intellectual property and reputation
		Methods used to protect information	- Logical and physical protection - Security policies and emerging technologies
		How moral and ethical issues affect computer users	- Privacy, security and cookies and data collection - Monitoring individuals and the impact of data loss or damage
		How legal issues protect computer users	Acts and legislation created to legally protect users, eg GDPR and Computer Misuse Act
		The cultural, personal and environmental impact of ICT	Changes in working practices to help employees and the environment
		How a digital footprint can impact computer users	- Digital footprint – passive and active and posts on social media - The risks of inappropriate images - Online theft and identity theft

The Wider KS4 IT Curriculum:

Homework expectations - Weekly retrieval quiz on SMHW and past paper questions. Students are encouraged to attend after school sessions to improve their coursework.

Computing KS4 Curriculum Overview

By the end of KS4, students should:

KNOW	Students have that knowledge that underpins effective use of skills, process and attitudes in the IT sector such as how different user interfaces meet user needs, how organisations collect and use data to make decisions, virtual workplaces, cyber security and legal and ethical issues.
DO	Students to continue to develop an understanding of the 3 pillars of ICT allowing them to use software application effectively as well as being able to program using Python.
APPRECIATE	Appreciate the impacts of digital technology to the individual and to wider society.

Curriculum Coverage:

	Topic	Sub Topic	Coverage
Year 10	Computing Concepts	Fundamentals of data representation	- Number bases - Converting between number bases - Units of information - Binary arithmetic - Character encoding - Representing images - Representing sound - Data compression
		Computer systems	- Hardware and software - Boolean Logic - Software classification - Classification of programming languages and translators - Systems architecture
	Computational thinking and Programming Skills	Fundamentals of algorithms	Representing algorithms
		Programming	Inputs and outputs
	Computing Concepts	Fundamentals of computer networks	- The purpose of different types of networks - Network security
		Cyber security	- Fundamentals of cyber security - Cyber security threats - Methods to detect and prevent cyber security threats
Year 11	Computer Concepts	Ethical, legal and environmental impacts on digital technology on wider society, including issues of privacy	- Explain current ethical, legal and environmental impacts and risks of digital security - Considering privacy issues
		Relational databases and structured query language	- Relational databases - Structured query language
	Computational Thinking and Programming Skills	Fundamentals of Algorithms Programming	- Efficiency of algorithms - Searching algorithms - Sorting algorithms - Data types - Programming concepts - Arithmetic operations in a programming language - Relational operations in a programming language - Boolean operations in a programming language - Data structures - String handling operations in a programming language - Random number generation in a programming language - Structured programming and sub routines - Robust and secure programming

The Wider KS4 Computing Curriculum:

Homework expectations - Homework expectations - Weekly retrieval quiz on SMHW and past paper questions.

IT KS5 Curriculum Overview

By the end of KS5, students should:

KNOW	Students to extend their knowledge on effective use of skills, process and attitudes in the IT sector such as how different user interfaces meet user needs, how organisations collect and use data to make decisions, virtual workplaces, cyber security and legal and ethical issues.
DO	Develop an understanding of the 3 pillars of ICT allowing them to use software application effectively as well as understand the use of ICT in society. Create IT projects in line with the current developments within the wider society.
APPRECIATE	Appreciate the impacts of digital technology to the individual and to wider society.

Curriculum Coverage:

	Topic	Sub Topic	Coverage
Year 12	Information Technology systems	- IT systems used in organisations - Users, stakeholders and business needs	- Internal/external system users - Functional/non-functional requirements - Impact on productivity and communication - Benefits, limitations and risks
		- Hardware, software and emerging technologies - Selecting technology for a purpose	- Input, output, storage and processing devices - System, application and utility software - Cloud, virtualisation and mobile working - AI, IoT and automation
		- Networks, cloud and communication - Secure data sharing	- LAN, WAN, wireless and infrastructure - Protocols, services and collaboration tools - Remote working and online communication - Security, reliability and performance issues
		- Data management, legislation and ethics - Responsible use of information	- Data lifecycle, quality and storage - GDPR, Data Protection and cyber legislation - Privacy, digital footprint and acceptable use - Environmental and social impact of IT
	Relational Database Management	- Client requirements and database planning - Entities, attributes and relationships	- ER diagrams and relationship modelling - Primary keys, foreign keys and integrity - Normalisation to reduce duplication - Success criteria linked to client brief
		- Creating relational database structures - Building a working database solution	- Tables, fields, data types and properties - Validation rules and error messages - Relationships between tables - Accurate/imported data and records
		- Queries, forms, reports and user interfaces - Interrogating and presenting data	- Single/multiple table queries - Criteria, parameters and calculations - Forms for data entry and navigation - Reports and dashboards
		- Testing, refinement and evaluation - Checking the database meets client needs	- Normal, extreme and erroneous test data - Object and usability testing - Evidence of pass/fail outcomes - Refinements and final evaluation
		- Coursework evidence and project management - Documenting design/development decisions	- Annotated screenshots and version control - Feedback from users/client - Improvements linked to testing - Final review against success criteria
	Cyber Security and Incident Management	- Threats, vulnerabilities and risk - How attacks affect organisations	- Malware, phishing, social engineering and hacking - Threat actors and attack methods - CIA triad: confidentiality, integrity, availability - Risk assessment and security policies
		- Incident response and business continuity - Managing cyber security incidents	- Identification, containment and eradication - Recovery, communication and escalation - Disaster recovery and backups - Post-incident review

Curriculum Coverage continued:

	Topic	Sub Topic	Coverage		
Year 13	Cyber Security and Incident Management	- Managing cyber incidents - Applying the incident response lifecycle	- Monitoring, detection and triage - Containment, eradication and recovery	- Forensic principles and evidence handling - Business continuity and disaster recovery	
		- Security controls and protection methods - Reducing organisational risk	- Authentication, access control and permissions - Encryption, firewalls and anti-malware	- Backups, patching and secure configuration - Policies, training and acceptable use	
		- Legal, ethical and organisational impacts - Evaluating consequences of incidents	- Data loss, service disruption and reputation - Computer Misuse Act and data protection duties	- Financial, moral and legal implications - Recommendations to reduce future risk	
		- Exam preparation and scenario practice - Using evidence to justify decisions	- Apply knowledge to realistic case studies - Analyse threats, vulnerabilities and controls	- Evaluate response strategies - Use precise cyber security terminology	
	Website Development	- Planning and designing a website - Responding to a client brief	- Audience, purpose and user requirements - Site map, page structure and navigation	- Wireframes, asset planning and success criteria - Accessibility and usability considerations	
		- Developing pages with HTML and CSS - Creating a consistent website structure	- Semantic HTML and organised content - CSS styling and responsive layouts	- Consistent navigation and branding - Optimised images/media and file management	
		- Interactive features and functionality - Improving user experience	- Forms, buttons, links and embedded media - JavaScript or interactive elements	- Validation and accessibility checks - Testing across browsers/devices	
		- Testing, evaluation and final improvements - Reviewing against client requirements	- Functional and usability testing - Evidence of refinements made	- Evaluate strengths and limitations - Recommend future improvements	

The Wider KS5 Curriculum:

Homework expectations - Weekly retrieval quiz on SMHW and past papers in Year 12 and coursework tasks in Year 13.