Computer Science – KS3 Curriculum Summary (2023-2024)

Year 7: Introducing key skills and terminology needed to understand the basics of Computer Science and how to be an efficient end-user of ICT.
Ultimately building a confidence in Computer Science.
PowerPoint lessons, worksheets, homework sheets, entrance activities, videos on external websites (see lesson plans), supported learning with completed versions on the whiteboard and end of Topic test.

SER	E-Safety	Spreadsheets and Cryptography	Hardware and Software	Scratch	Micro bit / History of Computers
Aim - To develop basic skills needed to use ICT equipment sensibly, effectively and Responsibly	**Aim** - To develop a deeper understanding of the risks that are on the internet and know how to protect themselves.	**Aim** - To develop basic spreadsheet skills that are used in businesses. To introduce the concept of codes and ciphers using the cell references to encode and decode messages. Linking this to WW2 and Alan Turing efforts to decode the Enigma machines codes.	**Aim** - To develop a better understanding of the different devices we use and how their components and programs relate directly to our needs.	**Aim** - To develop better understanding of the key programming Constructs, Sequence, Selection and Iteration.	**Aim** - **To develop a better understanding of control systems, using a different language and device**
Being a responsible End-User and getting used to the basics in school. **Theme - Using the school network and resources well across all subjects**	**What are key online threats and how to keep safe.** **Theme - OSA online certificate completion.**	**Using a spreadsheet to introduce encryption and basic everyday spreadsheet skills.** **Theme - Making a party plan.**	**Understanding the Technology in our lives and matching its capabilities to our individual needs.** **Theme - Designing an ICT suite for a primary school.**	**Introduction to programming concepts through a visual block-based language.** **Theme - Designing and making their own game or story.**	**Consolidation of using block programming to create programs for the Micro bit.**
Key techniques – Using Email, spotting phishing emails, Setting up and initial use of One drive, Teams, personal school drives and Satchel One. Refining searching capability online.	**Key techniques** – Spotting more risks online, understanding the consequences, protecting themselves, communication with their peers about online risk.	**Key techniques** – Create a table of information using formulas and functions to make a model with suitable graphs. Be able to make predictions with their model. Make a simple encryption model. Encrypt and decrypt messages using a Caesar cypher.	**Key techniques** – Linking the components and applications to their or other users' needs.	**Key techniques** – Create a number of programs which allow for the use of sequence, selection and iteration constructs. Must be able to perform error checking to fix bugs in the code.	**Key techniques** – Create a number of programs which allow for the use of sequence, selection and iteration constructs. Focusing more on control and events block.

Key theory – Knowing key definitions such as Phishing - Useful shortcut keys.	**Key Theory** – Key definitions around e-safety.	**Key theory** – What is a spreadsheet and the key terms associated with them. What is Cryptography and the terms associated it.	**Key theory** – Understanding how data is stored. Knowing the different components and their roles.	**Key theory –** Sequence, selection and iteration.	**Key theory –** Sequence, Selection and Iteration for a specific device.
All subjects – Learning key skills required for life at Bullers Wood.	**Maths and English –** Learning key terminology related to online threats and their safety.	**Maths and English –** Using spreadsheets to complete simple calculations, which they check manually.	**Maths and Science –** Understanding the basics that computers only comprehend 1s or 0s to do with the electrical circuits.	**Maths and English -** Applying sequence and iteration (number of loops) to their code**.**	**Maths and Science –** Understanding and applying logic when creating their programs.

Year 8: Increasing independence and using more complex and challenging materials and processes. Beginning to explore processes beyond the classroom.
PowerPoint lessons, worksheets, homework sheets, entrance activities, videos on external websites (see lesson plans), supported learning with completed versions on the whiteboard and end of Topic test

Computer Crime & Cyber Security	Introduction to Programming	Introduction to Python	Spreadsheet modelling	Numbers and Images in Binary	Computer systems fundamentals
Aim - To explore legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and Copyright Law. Phishing scams and other email frauds, hacking, "data harvesting" and identity theft are discussed together with ways of protecting online identity and privacy. Health and Safety Law and environmental issues such as the safe disposal of old computers are also discussed.	**Aim** - To explore key concepts of programming, identifying computer skills such as decomposition, pattern recognition & abstraction. Practically creating algorithms, flowcharts & pseudocode to help develop code. Understand key programming concepts like statements, loops, data types, variables and debugging.	**Aim** - To introduce Python programming, an easy-to-use high-level programming language. The focus is on getting pupils to understand the process of developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs.	**Aim** - This is a practical, skills-based unit covering the principles of creating and formatting basic spreadsheets to produce and use simple computer models. It includes spreadsheet concepts such as cell references, simple formulae and formatting.	**Aim -** This program is designed to explore the concepts of how pictures are stored on a computer. How pixels are used to create significantly more complex images and how they create basic images using binary calculations**.**	**Aim** - To explore and identify different components of a computer with a focus on the central processing unit and memory. To describe to understand key software needed to run, manage and maintain a PC.
Theme – To revisit and further understand threats and dangers faced when using computers and the internet.	**Theme – Introducing universal programming concepts to help understand programming using everyday scenarios.**	**Theme – Creating a programming portfolio demonstrating a basic level of programming competence.**	**Theme – Understand that spreadsheets can be used to build financial models, produce sales figures and create graphs for visual representation for an organisation.**	**Theme – Being able to create monochrome images.**	**Theme – Task is to build your own PC with a budget and a design specification for the client specific needs.**

Key techniques – Researching Information on the internet, Note taking. Sharing some of their experiences with using IT so far.	**Key techniques –** Creating functional programs. Rectifying basic syntax errors. Applying key theories of sequence, selection and iteration to their solutions.	**Key techniques –** technical vocabulary associated with programming and particularly Python, such as: Integrated development, IDLE, interactive mode, Script mode, variable, string, syntax, assignment statement, augmented assignment operator, data type, integer, float, round, BIDMAS, selection, iteration, syntax error, logic error, debug, binary search.	**Key techniques –** Manipulate existing tables to create models for an event. Using formulas and functions to complete calculations for a possible business venture. Learning to read information from a spreadsheet in order to make assumptions about trends.	**Key techniques –** Binary to decimal conversion to create a variety of pixelated images that have 2/4 colours. Using the cell fill to create the images**.**	**Key techniques –** Research the appropriate parts on the internet. Sorting information found by price and relevance to the client. Recall - remembering that the key components need to have a functioning computer.
Key theory – Phishing, hacking, malware, virus, Trojan, logic bomb, geo-tagging, data harvesting, cybercrime, RSI, copyright, e-waste.	**Key theory -** Understand the key computing skills, techniques used to design and build code. Detecting errors and using them to identify how to debug.	**Key theory** – Understanding key python concepts to help develop programming code.	**Key theory** – Spreadsheet Model and simulation, using cells; row; column; formatting; currency formulas; relative reference; absolute reference; validation macro & pie chart.	**Key theory** – Binary to decimal (Visa Versa) conversion, understanding pixels and how they are made using RGB values. How pixels are used to make images, how pixels relate back to their devices and cameras.	**Key theory** – Computer components, CPU, memory/storage, operating systems and utility software.
English - Basic Literature and terminology of particular computer-based laws.	**English & Maths –** Learning key terminology related to programming and using mathematical algorithmic concepts and flowcharts.	**Maths –** Learning mathematical concepts like BIDMAS & data types.	**English & Maths –** Learning key terminology related to spreadsheets, mathematical calculations and formulas, charts and graphs.	**English & Maths –** Reinforcing simple arithmetic calculations	**English & Maths –** Numeracy, Effective Communication, Independent Learning and Researching, Literacy.

Year 9: Working on more complex programming with links to GCSE techniques, promoting independence and problem-solving skills. Looking at how programmes and software are used in industry. PowerPoint lessons, worksheets, homework sheets, entrance activities, videos on external websites (see lesson plans), supported learning with completed versions on the whiteboard and end of Topic test					
Understanding computers	**Flowcharts**	**Python next steps**	**Networks**	**Databases**	**HTML**
Aim - The unit is a theoretical unit covering the basic principles of computer architecture and use of binary.	**Aim** - This unit deals with flowcharts and explains it uses diagrams that represents a set of instructions. Flowcharts normally use standard symbols to represent the different types of instructions pupils will understand how use these symbols are used to construct the flowchart and show the step-by-step solution to the problem.	**Aim** - Pupils then, compare for loops with while loops, before moving on to arrays (lists), which are introduced as a new data structure and are used in conjunction with for loops. Procedures and functions with parameters are covered to help pupils understand the concept and benefits of modular programming. developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs.	**Aim** - This is a theoretical unit covering the basic principles and architecture of local and wide area networks.	**Aim** - The unit is a practical unit covering the basic theory, creation and use of a single-table database and a simple relational database.	**Aim** - This unit in the first three lessons, pupils will learn the basics of HTML and CSS, and how to create a responsive design which adapts to any size of screen for viewing on, say, a mobile phone or a PC.
Technical Theme – associated with this Unit, such as: **Input, process, output, device, hardware, software, fetch, decode, execute, binary, conversion, memory, RAM, ROM, denary, ASCII, code, pits, lands, burn, read, write, data, track.**	**Technical Theme – Create a number of problem-solving diagrams for many given problems that are both day to day life situations and computing problems. This will allow the pupils to learn of sequence, selection and iteration constructs.**	**Technical Theme – associated with programming and particularly Python, such as:** **Integrated development, IDLE, variable, string, assignment statement, data type, casting, integer, float, round, BIDMAS, selection, iteration, loop, syntax error, logic error, debug, list, array, index, procedure, function, call, argument, parameter, modular program, dry run.**	**Technical Theme – associated with this Unit, such as:** **Internet, World Wide Web, URL (Uniform Resources Locator), IP address, protocol, wide area network, local area network, data packets, packet switching, domain name, client-server network, peer-to-peer network, cloud computing, encryption, decryption, plaintext, cipher text.**	**Technical Theme – associated with this Unit, such as:** **Flat-file database, relational database, table, column, record, field, query, parameter, criterion, criteria, primary key, linked tables.**	**Technical Theme – associated with HTML, CSS, Web design and development, such as:** **HTML, tags, attribute, property, CSS, inline, internal, embedded, external, style, element, text editor, web browser, navigation, responsive design, hyperlink, template.**

Key techniques – Understand how computers internal components work and how CPU's work. They will also learn how memory and storage works in different computer systems.	**Key techniques –** Understand how a flowchart is a diagram that represents a set of instructions. Flowcharts can be used to plan out programs and help understand how to develop programs.	**Key techniques –** 6 PowerPoint presentations, each designed to cover one lesson. 8 worksheets, many with example responses. An end-of-unit learning portfolio for assessment purposes.	**Key techniques –** Understand different computer systems work in a variety of organisations such as schools, government offices and home networks.	**Key techniques –** Understand how databases are used in every day. They will also understand what the front end and back end of a database looks like and how to design this.	**Key techniques –** Understand how to code, develop and create web pages you can find on the internet. They will learn techniques of how they can customise a webpage.
Key theory – Phishing, hacking, malware, virus, Trojan, logic bomb, geo-tagging, data harvesting, cybercrime, RSI, copyright, e-waste.	**Key theory** – Flowcharts normally use standard symbols to represent the different types of instructions. These symbols are used to construct the flowchart and show the step-by-step solution to the problem.	**Key theory** – 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' in some languages). Create and call a function or procedure. Find and debug syntax errors. Look at a given section of code and describe its function.	**Key theory** – State that the Internet is a wide area network and the world wide web is part of the Internet. Define the meaning of the terms "domain name", http protocol. Explain the basic principle of packet switching. Give examples of LANs and WANs. State three different network topologies. Describe what is meant by a client-server network and state some of its advantages. State why some transmissions are encrypted, and use a simple algorithm to encrypt and decrypt a message.	**Key theory** – Give examples of databases used by organisations which are accessible to the public via the Internet. Create a database table using several fields with different data types. State the purpose of a primary key in a database. Create a basic input form to input data. Query the database using more than one criterion to find answers to user queries. Create a basic report with suitable headings. Create a front-end application menu with buttons linking to a form and a report.	**Key theory** – Write HTML code to create a simple web page and display it in a browser. Write CSS to define the styles used in a web page. Create a simple navigation system using HTML. Use a design to create a template for a web page using HTML. Create their own multi-page website. Insert text, images and links on their web pages.

English - Basic Literature and terminology of particular computer-based laws.	**English & Maths –** Basic Literature and terminology of particular computer-based programming vocabulary.	**Maths –** Learning mathematical concepts like BIDMAS & data types.	**English -** Basic Literature and terminology of particular computer-based laws.	**English & Maths –** Learning key terminology related to databases, mathematical calculations and formulas and visual basic techniques.	**English & Maths –** Basic Literature and terminology of particular computer-based laws and key themes as mentioned above.