Subject: Computing Year 8 Ability Mixed

	Unit 1	Unit 2	Unit 3
Topic	Internet Safety, Cyber Security and Encryption	Advanced Spreadsheets	Computer Components
Topic overview **Pupils will learn…**	Understand the impact of operating online upon our daily lives, including new and developing security risks and the best methods of tackling them	Explore a range of complex spreadsheets tools and develop the knowledge needed to collect accurate data and automate processes to meet the needs of specific users	Understand the roles played by inputs, outputs, storage, memory, processors within a computer system and recognise the most appropriate components and systems for specific needs
Components	• Know the names, uses and audiences of a range different social media platforms in order to identify how they might be used by different groups of people (social, employment/business, learning). • Understand that employers and other people use social media to make decisions and the dos and don'ts of using social media responsibly in order to consider the potential impacts of making posts to social media platforms. • Understand the importance of, how to choose secure passwords, and be aware of the dangers of reusing passwords in order to be able to keep personal information safe. • Be aware of the dangers posed by publicly accessible information, spot phishing scams, and understand the different types of malware can be used to attack a computer system in order to be develop an awareness of the most common threats in circulation today. • Be aware of software designed to protect computer systems from malware and match the protective measure to the threat in order to be able to take the correct course of action when experiencing a specific online security threat. • Understand what the term 'encryption' means, why encryption is used and be able to encrypt and decrypt messages using several different encryption methods in order to replicate a process carried out by many online systems and to recognise the need to keep data secure.	• Know and understand the structure and use of a range of more advanced functions of spreadsheets in order to embed skills developed within introducing spreadsheets, and develop complex skills needed in the world of work. • Understand how to use validation to create drop-down lists, use validation within spreadsheets to automate aspects of spreadsheets in order to develop accurate solutions for inputting data. • Identify the most appropriate functions to use in order to develop spreadsheets for a particular purpose. • Plan creative solutions to problems and design spreadsheets for a range of purposes making use of a range of more advanced functions. • Develop confident and responsible use of modern information to interpret data from spreadsheets in order to embed knowledge needed to access a range of IT based careers	• Name and describe the purpose of each component within a computer system (Motherboard, RAM, CPU, Storage device, Disk Drive, GPU) in order to recognise the role each plays in making a computer function • Explore the different measures of storage capacities and processor speed in order to identify good performance and justify their choice of computer hardware for a given scenario. • Identify different input, output devices and computer peripherals in order to describe how data can be input into, captured by, and outputted by a computer • Explain the difference between storage devices and storage media in order to correct differentiate between hardware and examples of a type of hardware • Explain the difference between primary and secondary storage in order to articulate the need for short-term memory and long-term storage, both of which are necessary for a computer to function • Compare different types of storage devices/media according to cost, capacity, durability and access speed in order to select and justify the most appropriate storage device/storage medium for a given scenario • Explore the concept of the Internet of Things (IoT), identify the different IoT devices, explain how IoT devices can be used with sensors to create automation in order to be able to discuss the possible benefits and drawbacks of IoT devices. •
What pupils should already know (Prior learning components)	From **Unit 2 of Computing Year 7**, students should have been taught to – • explore the real-world application of spreadsheets in order to understand how software is used to capture and model data for a range of purposes • analyse problems in computational terms by identifying the most appropriate functions to use when developing a spreadsheet for a particular purpose • 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.	From **Unit 2 of Computing Year 7**, students should have been taught to – • explore the real-world application of spreadsheets in order to understand how software is used to capture and model data for a range of purposes • Identify a range of functions that can be used to perform arithmetic and logical operations From **KS3 Mathematics**, students should been taught to – • Carry out arithmetic operations • Identify logical comparisons	In Computing **Unit 3 of Year 7**, students should have been taught to – • Explore the emergence of the CPU (including Moore's Law), to be able to articulate how computer technology has developed and improved over time Throughout Year 7 and **Unit 1 Year 8**, students should have been taught to – • undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals and meeting the needs of known users

			• Recognise hardware and software components that make up computer systems and identify some basic actions they perform • create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
Transferrable knowledge (skills)	• Being able to access computer systems, navigate to specific files and organise work in a logical structure. • Being able to recognise appropriate behaviour (offline or online) and apply the most appropriate responses, showing empathy and emotional intelligence • Being able to use multiple pieces of software (such as a web browser presentation software and a cloud computing system) in quick succession to create and refine design projects. • Use of inference and articulation to obtain key knowledge from a topic and apply understanding when presenting findings. • Being able to predict a likely outcome based on a set of inputs (secure passwords and encryption methods) •	• Being able to access computer systems, navigate to specific files and organise work in a logical structure. • Being able to use multiple pieces of software (such as a web browser, spreadsheet software a cloud computing system) in quick succession to create and refine design projects • Use of articulation to decide upon, use and justify the use of specific tools and skills to solve a wide computational problem • Being able to predict the outcome when using specific skills and identify / correct errors when they occur • Being able to check the accuracy of arithmetic calculations carried out electronically	• Being able to access computer systems, navigate to specific files and organise work in a logical structure. • Being able to use multiple pieces of software (such as a web browser, presentation software, word-processing software and a cloud computing system) in quick succession to create and refine design projects • Use of inference and articulation to obtain key knowledge from a topic and apply understanding when presenting findings • The use of presentation skills to 'inform' an audience of key findings from research alongside well-designed presentation material • Being able to use mental arithmetic to multiply and divide when moving upwards and downwards through a set of units of measurement
Key vocabulary pupil will know and learn	social media profile, privacy settings, avatar, hacked, brute force attack, shoulder surfing, password policy, phishing, hyperlink, malware, virus, trojan, worm, ransomware, adware, spyware, anti-malware software, anti-virus software, firewall, encryption, decryption, algorithm, cipher, plaintext, ciphertext, key	Spreadsheet, cell, row, column, cell reference, formula, brackets, functions - SUM, AVERAGE, MAX, MIN, IF, VLOOKUP, formatting, Data validation, Conditional Formatting, charts - bar chart, column chart, pie chart, line graph	hardware, CPU, RAM, motherboard, graphics card, power supply, hard drive, optical drive, software, peripherals, clock speed, hertz, byte, bit, kilobyte, megabyte, gigabyte, terabyte, petabyte, kilohertz, megahertz, gigahertz, peripheral, input device, output device, external storage device, storage device, storage medium, primary storage, secondary storage, optical storage, magnetic storage, Solid State storage, Internet of Things (IoT), microphone, keyboard, temperature sensor, light sensor, motion sensor, pressure sensor, GPS, trigger, condition, action
Assessment activities	• Regular low stakes testing at the end of each lesson to check knowledge. • A variety of knowledge-based questions, short answer tasks and extended writing tasks assessing the student's ability to identify key terms and demonstrate knowledge learned, developed, and interleaved within the unit. • Skills-based tasks where students demonstrate a combination of research and software skills, by creating a product designed to meet a set of success criteria • Do Now tasks which test previous learning and build recall on functions, formulae and formatting tools in use	• Regular low stakes testing at the end of each lesson to check knowledge. • Practical lesson activities which will self-mark students' work is correct, with cells turning green when students enter the correct answer. • Do Now tasks which test previous learning and build recall on key terms and applying them to specific contexts	• Regular low stakes testing at the end of each lesson to check knowledge. • Practical lesson activities which will self-mark students' work is correct, with cells turning green when students enter the correct answer. • Do Now tasks which test previous learning and build recall on key terms and applying them to specific contexts
Resources available	KS3 NC information National Curriculum - Computing key stages 3 and 4 (publishing.service.gov.uk) BBC Bitesize reference for business use of social media Social media - Technology and business - Edexcel - GCSE Business Revision - Edexcel - BBC Bitesize BBC Bitesize reference for advantages and disadvantages of social media Social networking - How ICT has changed communication and collaboration - KS3 ICT Revision - BBC Bitesize BBC Bitesize reference for encryption What is data encryption? - KS3 Computer Science - BBC Bitesize Online Encryption Simulator (Caesar Cipher)	KS3 NC information National Curriculum - Computing key stages 3 and 4 (publishing.service.gov.uk) BBC Bitesize reference for Spreadsheets How spreadsheets work - Spreadsheets - KS3 ICT Revision - BBC Bitesize	KS3 NC information National Curriculum - Computing key stages 3 and 4 (publishing.service.gov.uk) BBC Bitesize reference for Computer Components Computer devices - Digital devices - KS3 Computer Science Revision - BBC Bitesize BBC Bitesize reference for the Internet of Things The internet of things - The internet - GCSE Computer Science Revision - BBC Bitesize

	Caesar Cipher (Shift) - Online Decoder, Encoder, Solver, Translator (dcode.fr)		
Notes **Why this topic is important…**	The internet has become an essential part of our daily lives. People of all ages rely on the internet for communication, file sharing, entertainment, online shopping, banking, and much more. It is important to make sure people can keep themselves safe and keep their data secure. They can do this by, among other things, being conscious of the impact of social media, using anti-malware software and understanding the importance of encryption, which scrambles important data so that others can't understand it. This Unit builds on **Year 7 Unit 5** by revisiting the potential impact and consequences of using technology. It builds into learning which social media platforms are typically used by which demographic and exploring some of the consequences of posting to social media, including the impact on job prospects, as well as revisiting the issues around cyber-bullying. They will then apply this learning in the context of vetting job applications, which will expose students to the applications processes they will experience themselves in KS4 and beyond school. The focus on password policies, social engineering and phishing scams builds again on **Year 7**, now approaching these areas from the perspective of a breach having already occurred, students should take away the importance of choosing passwords carefully, avoiding social engineering and spotting phishing scams, malicious software (malware) that might be used to attack a computer system, and the software designed to protect against such attacks which will then be considered from a legal and ethical standpoint in **Unit 1 Year 9.** This unit also explores lesson introduces the idea of encrypting, or scrambling, data so that it cannot be understood even if it is intercepted. It focuses on the principle of encryption rather than on one specific encryption algorithm. Students will use this again in **Unit 4 of Year 8** when exploring the use of algorithms and the concept of processing data. These algorithm skills will be developed further in **Unit 5 of Year 8 and Unit 4 of Year 9**, where students will use a text-based programming language to design algorithms. The final area of the unit focuses on using practical spreadsheet skills to implement two encryption algorithms, which will introduce network security concepts within **GCSE Computer Science**.	Spreadsheets are incredibly useful and powerful tools. They are used every day by people in all sorts of ways, from storing information about products and stock levels to managing multi-million-pound budgets. This module focuses on more advanced features of spreadsheets, including new functions, form controls and macros to develop more bespoke and user-friendly spreadsheets. This unit builds on **Year 7 Unit 2**, by expanding the functions students are familiar with. It also requires students to apply functions and formulae interpedently to meet a specific scenario. Completing these activities will support students in using a key piece of software used by many industries and embed strong cross-curricular links with Mathematics. The knowledge developed will be applied within an end of Year project in **Year 9** as well. The knowledge developed in this unit will support students outside of school, into the world of work, but will also support them in developing confidence in using numbers such as within financial planning. It also forms one of the two key software tools used in the **BTEC Digital Information Technology**, explores principles of functions and logic are a key component of **GCSE Computer Science**, and links to financial forecasting within **BTEC Enterprise**.	Knowing about the core components that make up digital devices is essential if you want to understand what you are using, if you want to make good decisions when you choose new tech and if you want to fix problems. This module explores what is inside a computer as well as how a computer's performance can be measured. It also looks at computer peripherals and types of storage and culminates in an examination of the latest technology available with the Internet of Things. This unit builds upon the **Unit 3 of Year 7**, where students were introduced to the key components inside a standard computer. They will extend prior learning how by identifying each component's basic functionality and its impact upon performance. It looks at how storage capacity and speed are measured and explores how you can compare different units of measurement to compare components. This unit will explore peripherals and what makes a peripheral an input or an output device, leading into **unit 3 Year 9,** where they will also look at how data that is input is transmitted across networks so that computers can communicate. The unit also explores how technology has advanced with the introduction of Internet of things (IoT) devices. As well as considering how they work, linking back to input and output devices, students will explore the benefits and drawbacks of such devices and will have the opportunity to design their own smart home, which will enable them to form ethical arguments building from **Unit 6 of Year 7**, **Unit 1 of Year 8**, and explored further in **Unit 1 Year 9**.