Topic and Year	Core/critical knowledge to know and remember
Year 7	
7.1 Introduction to Computing & E-Safety	- Know what makes a strong password and why passwords should never be shared or reused - Know what social engineering is, and recognise the warning signs of phishing and advance fee fraud - Know that a digital footprint is the permanent trail of data we leave online and how it can affect our future - Know what malware is, common types, and key ways to reduce the risk (e.g. anti-malware software, firewalls) - Know how to check whether a news story or source is trustworthy (or whether it is likely to be Fake News) - Know what cyberbullying is, the effects it has on others, and how to be an upstander and report concerns
7.2 Data Representation	- Know that computers use binary because their circuits have two states: on (1) and off (0) - Know that a bit is a single binary digit, a nibble is 4 bits and a byte is 8 bits - Convert numbers between 8-bit binary and denary - Know the rules for AND, OR and NOT logic gates and complete their truth tables - Draw simple logic gate diagrams to represent Boolean expressions
7.3 Intro to Computational Thinking & Programming (with Edublocks)	- Know that an algorithm is a series of steps to solve a problem - Define sequence, selection and iteration, and identify them within a program - Know that a variable is a named location in memory that stores a value which can change - Know that input allows a user to enter data, and output displays information/results back to the user - Define decomposition and abstraction as forms of computational thinking
7.4 Python Programming Fundamentals	- Know the arithmetic operators (+, –, *, /) and comparison operators (==, !=, <, >, <=, >=) and how to use them in Python - Know that variables are of a certain data type (integer, float or string) - Know the difference between a syntax error and a logic error - Know the standard flowchart symbols (terminator, process, input/output, decision) - Recognise sequence and selection within a Python program
7.5 Introduction to Artificial Intelligence (AI)	- Know that AI describes computer systems that perform tasks which normally need human intelligence - Know that machine learning models learn patterns from training data, and the basics of supervised, unsupervised and reinforcement learning - Know that poor training data can cause bias - Know that generative AI can produce convincing but incorrect results (hallucinations) - Know the ethical issues linked to AI, and why relying on AI to do your thinking (cognitive offloading) can stop you learning
7.6 Creative Media Project: Interactive Information Point	- Know that every digital product is designed for a specific audience and purpose - Know the principles of good design: consistency, colour contrast and readable sans-serif fonts - Know that hyperlinks allow non-linear navigation - Know the basic image editing tools and when to use them - Know that online images are protected by copyright, and that copying without credit is plagiarism

Topic and Year	Core/critical knowledge to know and remember
Year 8	
8.1 Python Programming 101	- Continues from Year 7 programming core knowledge - Know the main data types (integer, float, string, Boolean) and that casting converts data from one type to another - Know that print() produces output and input() always returns a string - Know that concatenation joins strings together - Know that selection uses if, elif and else, and that indentation shows which code belongs to each branch - Use comparison and Boolean operators (and, or, not) to construct a condition -
8.2 Web Development 101	- Explain what HyperText Markup Language (HTML) is used for - Explain what Cascading Style Sheets (CSS) are used for - Know that HTML is made of elements written with tags, and the structure of an HTML document - Know that a CSS rule is made of a selector, properties and values - Know that a web browser requests pages from a web server and displays the HTML and CSS -
8.3 Computer Systems	- Define hardware and software - Know the difference between input, output and storage devices, with examples of each - Know that the CPU processes instructions by fetching, decoding and executing them - Know the difference between RAM (volatile) and ROM (non-volatile) - Know the main types of secondary storage: magnetic, optical and solid state -
8.4 Data Science	- Know the difference between data and information - Explain how data is structured in a dataset using rows, columns and cells - Know how to use the functions SUM, AVERAGE, MAX, MIN, COUNT and COUNTIF - Know how charts and conditional formatting help identify patterns, trends, correlation and outliers (data visualisation) - Know that AI outputs must be checked for accuracy and bias, and that data confidentiality must be protected

Topic and Year	Core/critical knowledge to know and remember
Year 9	
9.1 Advanced Python Programming & Key Algorithms	- Continues from Year 8 Python Programming 101 core knowledge - Know the difference between count-controlled (for) and condition-controlled (while) iteration - Know that a list stores multiple items under one name, accessed by an index starting at 0 - Know that a subprogram is a reusable block of code, and that a function returns a value and a procedure does not - Know the purpose of validation checks (e.g. range, type, presence and length) - Explain how a linear search works and how to find a maximum or minimum value
9.2 Advanced Data Representation	- Continues from Year 7 Data Representation core knowledge - Know the units of data storage from bit to petabyte - Convert between binary, denary and hexadecimal, and explain why hexadecimal is used - Perform binary addition and explain overflow - Know how resolution and colour depth affect image quality and file size - Know the difference between lossy and lossless compression
9.3 Advanced Computer Systems	- Continues from Year 8 Computer Systems core knowledge - Know how clock speed, cache and number of cores affect CPU performance - Describe the stages of the fetch-decode-execute cycle - Explain why virtual memory is needed and why it slows the computer down - Know the difference between application software and systems software - Know the main functions of an operating system and the main types of user interface
9.4 Computer Networks & Cyber Security	- Define a network and know the difference between a LAN and a WAN - Know the purpose of a router, wireless access point and network interface card - Know the difference between the internet and the World Wide Web - Know that data is sent across networks in packets and that devices are identified by IP addresses - Know common cyber threats (malware, social engineering, brute-force attacks, hacking, denial of service) - Know how to prevent attacks (firewalls, anti-malware, strong passwords and 2FA, encryption)