Key Stage 3
Year 9 Computer Science and IT Learning Map

Unit	I am learning	By the end of this topic I will be able to	Assessment
1	**Data Representation and Logic** (KS3 links 1.2, 1.6 and 1.7): – What is a character set in a binary bit pattern that represents a character in coding methods – Binary addition to a given problem. – Images stored in a binary bit pattern. – Represent numbers/characters using binary. – Develop knowledge of images using 1-bit image representation. – Sound as analogue – What is a Logic Gates and how do they work?	By completing this unit pupils will have the opportunity to build skills built in the Year 8 Binary Unit. Pupils will recap Binary and how it works. This unit will build on previous knowledge gained and will develop pupils' skills by covering more in-depth data representation. Pupils will start to cover topics such as Hexadecimal, Binary Shift, Data representation as sound, and character sets. Pupils will identify different Logic Gates and the different Inputs and Outputs they give to different scenarios.	Binary workbook A Microsoft Forms assessment made up of exam-style questions covering all aspects of the unit. This will be carried out at the end of the unit
2	**Algorithms – Flowol** (KS3 links 1.1 and 1.4): – Identifying Symbols of Flowcharts – How to create simple flowcharts for a given scenario – Controlling Inputs and Outputs of a flowchart – Using a variable within a flowchart – Variables to control flow / combining with inputs and outputs – Creating Control System – What are sub-routines? – Advantages/Disadvantages of subroutines	This unit allows pupils to identify everyday situations where computer control is used. Pupils will identify common types of sensors used by control systems and be able to understand flowchart symbols and how they are used to break down problems You will be able to produce **flowchart-based** solutions for control systems that include sequences and loops and create flowcharts to include subroutines and variables to solve a given problem.	Flowol simulations A Microsoft Forms assessment made up of exam-style questions covering all aspects of the unit. This will be carried out at the end of the unit

3	**Network Design and Implementation (KS3 links 1.5)** - Advantages /Disadvantages of Networks. - Local Area Networks (definition and hardware required). - Wide Area Networks (definition and hardware required). - Data Packets and the Internet DNS and the Internet − Differentiating between local area networks (LANs) and wide area networks (WANs). − Exploring the concept of the internet as a global network. − Identifying and understanding the roles of key components like routers, switches, and computers. − Explaining the function of network cables and wireless connections.	Students will gain a more in-depth knowledge of networks and how the are implemented. Using knowledge from previous units this knowledge, information will be recalled and applied to new information on how networks are set up (topologies) and will look at more detailed Hardware for setting up a Network	Worksheet – Teams assignments A Microsoft Forms assessment made up of exam-style questions covering all aspects of the unit. This will be carried out at the end of the unit
4	**Get Creative with Data – Data Science (KS3 links):** − How to read and interpret different data sets. − Select a visualization/infographic to read and analyses data − Analyse visualisations to identify patterns, trends, and outliers − Use appropriate software tools to visualise data sets and look for patterns or trends − Select criteria and use a data set to investigate predictions. − Define the terms 'correlation' and 'outliers' about data trends Solve a problem by implementing steps of the investigative cycle on a data set.	Completing this unit allows you to gain a better understanding of how data works. You will gain an understanding of how data is modeled and be able to pick out key trends of data. By analyzing data, you will be able to abstract data from real-life situations	Worksheets A Microsoft Forms assessment made up of exam-style questions covering all aspects of the unit. This will be carried out at the end of the unit

5	**Advanced Python** (KS3 links 1.1, 1.2 and 1.7): – 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	By completing this unit, you will be able to understand the difference between data types and when to use certain data types in Python. You will develop an understanding of loops and when to use loops within code. You will be able to create lists and call upon those lists with a program. You will be able to predict and debug code ensuring it runs correctly.	Creating code PRIMM A Microsoft Forms assessment made up of exam-style questions covering all aspects of the unit. This will be carried out at the end of the unit

Computing and IT Key Stage 3 Curriculum Links

	Content	Year	Unit
1.1	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.	7, 8 & 9	Scratch/Python/Flowol *[Computer Science]*
1.2	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.	7, 8 & 9	Scratch/Python/Advanced Python/Binary *[Computer Science]*
13	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 [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.	7, 8 & 9	Scratch/Python/Advanced Python *[Computer Science]*
1.4	Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal].	8 & 9	Binary/Data Representation/ Logic Gates *[Computer Science]*

1.5	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.	7, 8 & 9	Networks/Technology /Back to the Future/Computer Crime *[Computer Science]*
1.6	Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.	7, 8 & 9	Technology/ Binary/ Data Representation/Spreadsheets *[Computer Science & IT]*
1.7	Undertake creative projects that involve 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.	7, 8 & 9	Spreadsheets /Multimedia Project/ Scratch/Python/ App Development *[Computer Science & IT]*
1.8	Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.	7, 8 & 9	Multimedia Project/ Back to the Future/Computer Crime/E-Safety/App Development *[Computer Science & IT]*
1.9	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.	7 & 8	E-Safety/Computer Crime/App Development *[Computer Science & IT]*