KS3 Curriculum Map – Computer Science:

Topic	Substantive Knowledge This is the specific, factual content for the topic, which should be connected into a careful sequence of learning.	Disciplinary Knowledge (Skills) This is the action taken within a particular topic in order to gain substantive knowledge.	Assessment Opportunities What assessments will be used to measure student progress?
E-Safety	- Online dangers - How to stay safe online - Phishing - Malware - Cat Fish - Cyberbullying - Trolls	- Learners will explain the potential dangers on the internet (e.g. cyber bullying, hacking). - Conduct research to be able to find definitions of key terms. - Students will create a poster to highlight the importance of e-safety. - Learners will research different methods on how to them safe on the internet. - Students will understand the steps to make a strong password. - Learners will be able to use their knowledge to be able to spot a phishing attempt. - Students will analyse the dangers and implications of using social media.	- Classwork - Homework - Baseline assessment. - Peer assessment. - Formative assessment (Quizziz)
Data Representation	- Units of data (Bit, nibble, byte, KB, MB, GB) - Binary conversion - Binary addition - ASCII	- Students will be able to understand why data must be stored in binary format. - Students will be able to convert denary numbers to binary numbers and vice versa. - Students will know how to add two binary numbers together and explain when an overflow error might occur. - Students will be able to define the term 'character set'.	- Classwork - Homework - Baseline assessment. - Peer assessment. - Formative assessment (Quizziz) - PQWC

		• Explain how characters are represented in binary.	
Algorithms	• Introduction to algorithms • Sequence • Selection • Iteration • Flowcharts • Interpret, correct and complete algorithms	• Learners will be able to define the three main principles and how they are used to define and refine problems. (Abstraction, Decomposition and Algorithmic Thinking). • Learners should understand the three basic programming constructs used to control the flow of a program. • To be able to create and refine algorithms using flow charts. • Students will be required to create a simple flow chart diagrams to show the structure of a problem.	• Classwork • Homework • Baseline assessment. • Peer assessment. • Formative assessment (Quizziz)
Micro:Bit	• Variables • Constants • Sequence • Selection • Iteration • IF statements • Operators	• Recap sequence, selection and iteration and understand how to refine a program using these within the micro-bit. • Students will understand what variables are and why and when to use them in a program. • Learners will understand how to create variables. • Understand the importance of iteration in programming. • Students will understand looping as a form of iteration. • Learn when to use the looping blocks 'repeat' 'while' and 'for'. • Students will understand what conditional statements are and why and when to use them in a program. • Learners will be required to use 'IF' statements blocks.	• Classwork • Homework • Baseline assessment. • Peer assessment. • Formative assessment (Quizziz)

Excel	• BIDMAS • Auto Sum • Average • IF Statement • Conditional Formatting	• Students will be able to create and modify spreadsheets. • Learners will be able to analyse and manipulate data. • Students will learn how to use AUTOSUM, MAX/MIN and COUNT functions. • Learners will use a range of tools to create graphs to analyse data.	• Classwork • Homework • Baseline assessment. • Peer assessment. • Formative assessment (Quizziz) • PQWC
Computer Hardware	• Input/output devices • What is inside a computer • General purpose system • Embedded Systems • FDE cycles • Registers • ALU • Performance factors of CPU • Different types of primary storage • Secondary storage devices	• Learners should understand the purpose of the CPU including the F-D-E cycle. • Describe the common CPU components and their functions: ALU, Cache, Registers. • Learners should be able to understand the need for secondary storage. • Be able to understand and define the different types of secondary storage. • By the end of the unit learners should be able to list different secondary storage devices. • Learners should be able to understand the purpose of RAM.	• Classwork • Homework • Baseline assessment. • Peer assessment. • Formative assessment (Quizziz) • PQWC
Data Representation	Numbers: • How to convert binary integers to their hexadecimal equivalents and vice versa • Binary shifts Characters • The use of binary codes to represent characters • The term 'character set' • The relationship between the number of bits per character in a character set, and the number of characters which can be represented, e.g.: • ASCII o o Unicode	• Understand the use of binary shifts • Understand the use of binary codes to represent characters • Understand the term 'character set' • Explain the relationship between the number of bits per character in a character set, and the number of characters that can be represented using: 1. ASCII 2. Extended ASCII 3. Unicode	• Linked Homework & Classwork • Mid-Year Assessment • End of Year Assessment • PQWC

		Students will be able to:	
Boolean Logic	Boolean Logic & Algebra • Simple logic diagrams using the operators AND, OR and NOT • Truth tables • Combining Boolean operators using AND, OR and NOT • Applying logical operators in truth tables to solve problems	Students will be able to: • Construct truth tables for the following logic gates: 1. NOT 2. AND 3. OR • Construct truth tables for simple logic circuits • Create, modify and interpret simple logic circuit diagrams	• Linked Homework & Classwork • Mid-Year Assessment • End of Year Assessment • PQWC

Legal, Ethical & Environmental Issues	Legal Issues
	Students will consider the following laws:
	• The Computer Misuse Act
	• The Freedom of Information Act
	• The Data Protection Act
	• The Copyright, Designs & Patents Act
	• The Creative Commons License
	
	Ethical Issues
	• The Internet & Big Data
	• Censorship
	• 'Computers in the Workforce' - The automation of human labour
	• WFH – Working From Home: The Social and Cultural Impact
	
	Online
	• Digital Footprint
	• Viral Media
	• Cookies
	• GDPR
		Students will be able to:
		• List ethical issues, cultural issues and environmental issues in relation to a given scenario
		• List items of legislation that relate to digital technology
		• Discuss the impacts of digital technology on the wider society including ethical issues, cultural issues and environmental issues
		• Discuss the impact of manufacture, disposal, upgrading and replacing digital technology
		• Discuss the impact of e-waste
		• Discuss the impact of digital technology regarding legal issues and privacy issues
		• Describe legislation relevant to Computer Science including
		   o The Data Protection Act 2018
		   o Computer Misuse Act 1990
		   o Copyright Designs and Patents Act 1988
		• Describe the features of open source and proprietary software licences
		• List the clauses of the Data Protection Act and Computer Misuse Act and give examples of situations in which they are relevant
			• Linked Homework & Classwork
			• Mid-Year Assessment
			• End of Year Assessment
			• PQWC

		• Evaluate the impact of and issues related to the use of computers in society	
Programming Skills	• Programming Constructs – Sequence, Selection & Iteration. • Variables & Data Types - integer, real, Boolean, character, string. • Type casting • Input and output • If statements • String manipulation • Programming Project – Scratch Game Development	• Understand and use data types: integer, real, Boolean, character and string • Declare and use constants and variables • Use input, output and assignment statements • Use random number generation • Write algorithms in pseudocode involving sequences • Use arithmetic operators including MOD and DIV • Use string handling and conversion functions • Use selection and nested selection statements • Use NOT, AND and OR when creating Boolean expressions • Understand and use iteration in an algorithm • Write algorithms in pseudocode involving sequence, selection and iteration	• Linked Homework & Classwork • Mid-Year Assessment • End of Year Assessment • PQWC
Careers	• Students explore the emergence of STEM-related careers and how this has affected the wider community. • Students research careers in Computing – with an emphasis on emerging technologies • Quantum Computing	• Learners will work in groups and work cohesively to produce a presentation on the future of STEM technologies and careers in the field. • Learners will develop a further understanding of how Computing is influencing other sectors of work.	• Linked Homework & Classwork • Mid-Year Assessment • End of Year Assessment • PQWC