KS4 Computer Science Curriculum Map

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Algorithms. Data Representation.	**Algorithms. Data Representation.**	**Programming. Hardware and systems.**	**Programming. Hardware and systems.**	**Programming. Networks.**	**Programming. Networks.**
Year 10	**Data Representation** Students will learn about decimal, binary and hexadecimal number bases and the units of measure computers use. They will learn that binary numbers can be added together and a binary shift can be used to multiply numbers. **Algorithmic thinking** Students will start by learning about computational thinking. They will then learn about how problems can	**Data Representation** Students will learn about how images, sound and text are represented and how these are compressed. **Algorithmic thinking** We will complete the work on pseudocode and learn about trace tables. Following this students will learn about searching algorithms	**Hardware and systems** This is unit will cover a large number of different aspects associated with the computer hardware and software. The unit starts with Boolean logic gates followed by hardware basics and then moves into software in this half term. . **Programming** Students will complete the first couple of lessons on Python programming learning about the basics of command line driven programming.	**Hardware/systems** We will look firstly at the structure of the CPU including the Von Neumann architecture, the role of main memory and individual components of the CPU. We will look at what aspects of the CPU architecture can impact the performance of the CPU. We will look at the Fetch-execute cycle and consider what is happening at each stage. We will then progress to look at memory and secondary storage and their differences ensuring that we cover a wide range of	**Networks** This unit covers a large number of different topic areas that are all interlinked. The unit will start by looking at the idea of a computer network and why we use them, we will look at both the advantages and the risks that arise from their use. We will then consider the different types of computer network and discuss some of the network topologies that can be used. We will finish this unity by considering the differences between	**Networks** The networks unit is completed lookinga t network security. Students learn how to secure networks using a variety of software tools. **Programming** Students will continue to learn about command line driven programming using Python. The concepts they will learn this half term are: Roll of functions and procedures (pseudo and flowchart) Local and global variables

	be solved by representing them as algorithms in the form of flow charts and pseudocode.		The concepts they will learn this half term are: Arithmetic operators and Modular and floor division Relational operators Iteration - while then for Iteration - while then for	storage types including cloud storage. We will look at the advantages and disadvantages of each of these storage methods and when each one is most likely to be used. Teacher 2 (RBI) Programming Students will continue to learn about command line driven programming using Python. The concepts they will learn this half term are: Selection Writing good code and improving work Errors and constants Lists Random numbers	wired and wireless networks. The unit then moves onto protocols. **<u>Programming</u>** Students will continue to learn about command line driven programming using Python. The concepts they will learn this half term are: Consolidating programming knowledge Input and string manipulation Working with text files	Return Statements Practice writing functions.

Academic Excellence

We provide a supportive and challenging environment to ensure our students achieve academic excellence.

Ambition

We have the highest expectations for academic excellence and personal development and work hard to achieve them.

KNUTSFORD ACADEMY

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Algorithms and programming. Cyber Security	**Programming. Databases.**	**Programming and revision activities**	**Programming Legal, Moral and Environmental.**	**Revision**	
Year 11	**Cyber Security** Students will learn about what cyber security is and why it is important in today's society. We will cover social engineering and the malicious code that can be written to compromise systems. Students will also learn about the threats to networks and how these can be mitigated against. **Computational Thinking** We will complete the work on pseudocode and learn about trace	**Databases** Students will learn about how data is structured in a database and the reasons why databases are used. In addition, students will also learn about how to create and query a database using SQL programming. **Programming** Students will continue to learn programming and will focus on the below techniques: Writing good code and improving work Errors and constants Lists	**Paper 2 content** Students will continue the uit on databases and then there will be a period of revision prior to the trial 2 exams. **Programming** We will complete the main part of the programming content by focusing on the below techniques: Input and string manipulation Working with text files Roll of functions and procedures (pseudo and flowchart)	**Legal, Moral, Environmental** Students will learn about the legal, moral and environmental impacts of computing in society. **Programming** There will be lots of opportunities to practice programming during this half term.	This half term will be made of a variety of revision exercises	

	tables. Following this students will learn about searching algorithms **<u>Programming</u>** Students will complete the first couple of lessons on Python programming learning about the basics of command line driven programming including: Input, print, variables, concatenation Python data types and Typecasting Arithmetic operators and Modular and floor division Relational operators Iteration - while then for Selection	Random numbers	Local and global variables, Return Statements Practice writing functions			