Carnforth High School

Curriculum Map - Computing

		Autumn		Spring		Summer	
		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 7	Content, Knowledge & Skills	**Digital Literacy:** In this unit, pupils will develop the following skills/knowledge: • Logging in to and using school systems • Understanding the use of social media • Protecting personal data • Using Word and PowerPoint to present information • Using Outlook to manage emails • Using OneNote to share resources • Effective web searching	**Computer Systems:** In this unit, pupils will develop the following skills/knowledge: • What is a computer? • What is computer hardware and what are the main parts in a computer? • Using different input & output devices • Function of the CPU • What is Computer software and its different purposes? • Operating systems and their main functions	**Scratch Programming:** In this unit, pupils will develop the following skills/knowledge: • Planning, including the use of algorithms • Using block coding to create a programme • Sequencing instructions • Creating and using variables • Utilising user input • Using selection in a programme to make decisions • Using Boolean operators in programming code • Testing a programme to make sure it meets the purpose		**Spreadsheets:** In this unit, pupils will develop the following skills/knowledge: • How to add, edit and delete data in a spreadsheet • Effective formatting of a spreadsheet • Using mathematical operators to make calculations • Using formulae to carry out calculations automatically • Using functions, such as SUM, AVERAGE, MAX, MIN, COUNT, IF, and VLOOKUP • Presenting data in graphs	**Graphics Editing:** In this unit, pupils will develop the following skills/knowledge: • Understand bitmap and vector images • Sourcing assets and copyright law • Understand the properties of digital images and how they affect quality • Combine images and text in an impactful way • Use selection tools effectively • Be able to remove parts of an image • Use layers appropriately • Understand the use of different adjustment tools

	Prior Knowledge	Students will have been taught e-safety at primary school. This unit is to align all learning along the Carnforth High School expectations.	Student's experience with computer hardware will differ greatly from pupil to pupil. It is not expected that pupils will have any specific prior knowledge in this area. They should have some understanding of selecting and using appropriate software for specific tasks.	Most students will have been taught to code using either Scratch or Purple Mash in primary school. They should have some experience with designing and debugging programs. They should also have experience of using sequencing, selection and repetition in programmes.	It is expected that students will understand the use of basic mathematical operators and be able to use them to make calculations.	It is not expected that pupils will have any prior experience with using graphics editing software, but will have an idea of what a good graphics product looks like.
	Assessment	Formative assessment in lesson Summative end of unit assessment task	Formative assessment in lesson Summative end of unit assessment task	Mid-Point Summative Assessment and Practical Project Based Assessment	Formative assessment in lesson Summative end of unit assessment task	Practical project summative based assessment
	Key Vocabulary	E-Safety, Social Media, Username, Password, Search Engine, Email, Outlook, OneNote	Hardware / Software / Input / Output / Random Access Memory / Read Only Memory / Processor / Central Processing Unit / Operating System / Application / Binary	Sequence, Selection, Iteration, Algorithm, Variable, Input, Programming	Spreadsheet, Formula, Function, Graph, Cell, Formatting, Calculation, Operator	Bitmap, Vector, Selection, Properties, Pixel, Pixelated, Copyright

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Year 8	**Content, Knowledge & Skills**	**Digital Wellbeing:** In this unit, pupils will develop the following skills/knowledge: • Health & safety issues when using technology • Impact of online abuse • Impact of false information • Protection of content using Copyright • Impact of data loss • Impact of our use of technology on the environment	**Computational Thinking:** In this unit, pupils will develop the following skills/knowledge: • Using algorithms to help solve problems • Understand how to utilise abstraction • Understand how to utilise decomposition • Understand how to utilise pattern recognition • Demonstrating problem solving skills • Converting binary, denary and hexadecimal values	**Python Programming:** In this unit, pupils will develop the following skills/knowledge: • Use a text-based programming language to create programs • Effective planning, including the use of flowchart and pseudocode algorithms • Using different data types • Create and assign variables • Identify and fix syntax and logic errors • Use sequence, selection and iteration to create working programmes • Utilise comments to document code in a programme • Create a programme to meet the needs of a given problem	**Databases:** In this unit, pupils will develop the following skills/knowledge: • Understand the difference between flat file and relational databases • Create tables in a database • Assign appropriate properties to tables and • Be able to add, edit and delete data in a database table • Be able to query data in tables • Utilise basic SQL commands to retrieve data from a database	**Audio Editing:** In this unit, pupils will develop the following skills/knowledge: • Understand the advantages of different audio file formats (MP3 and WAV) • Creating a script for audio projects • Sourcing assets appropriately • Using basic editing tools, such as; importing, selecting, cutting, zooming, timeshift • Using advanced editing tools, such as; fading-in/out, changing pitch and tempo, envelope, amplification • Collecting audio using a microphone

	Prior Knowledge	In year 7, pupils have studied the use of social media and keeping their data safe in HT1, which links to online abuse and computer misuse. In HT6, they were introduced to copyright law, which feeds into law and legislation.	Pupils were introduced to computer systems and the way they work in HT2 of year 7, as well as their first taste of binary. During HT3 and HT4, pupils also began to develop their computational thinking skills through the use of algorithms to plan a programme.	During HT3 and HT4 of year7, pupils were taught to use sequencing, selection and iteration by using a block-based programming language. Pupils will have an understanding of the basic programming concepts and constructs, but the emphasis is now on pupils to be able to understand, develop and write lines of code with a text-based language. Focus will also shift to spotting and fixing errors in program code, and creating a program to meet a specific need.	This unit builds on the student's understanding of handling and manipulating data that they learned in year 7 HT5 when using spreadsheets.	This unit builds on the student's understanding of creative product development that they learned in year 7 HT6 when creating graphics.
	Assessment	Formative assessment in lesson Summative end of unit assessment task	Formative assessment in lesson Summative end of unit assessment task	Mid-Point Summative Assessment and Practical Project Based Assessment	Formative assessment in lesson Summative end of unit assessment task	Formative assessment in lesson Summative end of unit assessment task
	Key Vocabulary	Repetitive Strain injury, Abuse, Cyber Bullying, Misinformation, Fake News, Data, Information, Password, Copyright, Data Protection, Environment	Algorithm, Flowchart, Pseudocode, Abstraction, Decomposition, Pattern Recognition, Binary, Denary, Hexadecimal	Algorithm, Flowchart, Pseudocode, Python, Integrated Development Environment (IDE), Programming, Variable, Selection, Iteration, Decision, Sequencing, Syntax, Logic Error, Debug, Comments	Flat-file, Relational, Database, Table, Field, Record, Entity, Query, Structured Query Language (SQL), Boolean, Primary Key	Audio, Audacity, Import, Record, Select, Zoom, Cut, Fade, Amplify, Timeline, Pitch, Tempo, Copyright, MP3, WAV

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Year 9	**Content, Knowledge & Skills**	**Cyber Security:** In this unit, pupils will develop the following knowledge: • Understand the value of personal data • Understand different types of online scams • Understand different types of computer misuse • Methods used to stop network threats • How law and legislation affects the use of technology • Careers in cyber security	**Data Representation:** In this unit, pupils will develop the following skills/knowledge: • Recap converting binary, denary and hexadecimal values • Adding 2 binary values and the issue of overflow • Converting binary to text using character sets • Converting binary to images • Converting binary to sound • Use of lossy and lossless compression	**Web Design:** In this unit, pupils will develop the following skills/knowledge: • Understand what makes a good website • Create a webpage • Using HTML coding to add basic content to webpages • Create working hyperlinks • Utilise suitable navigation for a website • Use CSS coding to consistently format style options • Use JavaScript to add interactive elements to a webpage	**Computer Networks:** In this unit, pupils will develop the following skills/knowledge: • What is a network? • Advantages and disadvantages of using computer networks • How data is sent along a network • Using LANs • Using WANs • Identify different network topologies • Network hardware	**Impact of Digital Technology:** In this unit, pupils will develop the following knowledge: • Uses of artificial intelligence • Technology utilised for self-driving cars • Development of robotics • Application of technology in medicine • Environmental impact of tech • Careers in technology
	Prior Knowledge	In year 7 and 8, pupils have studied the potential negatives to using computers online, keeping their data safe, online abuse and basic computer misuse.	Pupils were introduced to computer systems and the way they work in HT2 of year 7, as well as the conversion of binary code in year 8.	This unit builds on the student's programming skills, but offers a step into an alternate programming language. The skills developed in Y7 and Y8 in using planning, developing and testing skills, when programming, will all be useful in this unit.	Pupils were introduced to computer systems and the way they work in HT2 of year 7, which provided a basic overview of how computers communicate.	In HT1 of year 7 and 8, pupils will have developed some understanding of the positive and negative uses for technology, feeding into their own experiences, providing a base for their understanding of how technology is used in the real world.

	Assessment	Formative assessment in lesson Summative end of unit assessment task	Formative assessment in lesson Summative end of unit assessment task	Mid-Point Summative Assessment and Practical Project Based Assessment	Formative assessment in lesson Summative end of unit assessment task	Formative assessment in lesson Summative end of unit assessment task
	Key Vocabulary	Cyber Security, Phishing, Ransomware, Malware, Virus, Hacking, Social Engineering, Authentication, Anti-Virus, Firewall, Biometrics, Computer Misuse Act, Data Protection	Binary, Denary, Overflow, Storage, Character Set, ASCII, Unicode, Bimap, Pixel, Pixelation, Analogue, Sample, Amplitude, Frequency, Compression, Lossy, Lossless	Website, Webpage, Structure, Static, Hyperlink, Navigation, HTML, CSS, Style, Formatting, Tags, JavaScript	Network, Data, Packet, Local Area Network, Wide Area Network, Topology, Star, Bus, Ring, Router, Ethernet, Wi-Fi, Hub, Switch	Artificial Intelligence, Autonomous, Turing-Test, Robotics, Medicine, Environmental, Application

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Year 10	**Content, Knowledge & Skills**	**GCSE CS P1 – Programming (Fundamentals):** In this unit, pupils will develop the following knowledge: • Using data types • Assigning variables • Assigning constants • Writing programs using selection • Creating input and output • Generating random numbers • Using arithmetic operators • Using logical expressions	**GCSE CS P2 – Computer Systems:** In this unit, pupils will develop the following knowledge: • What is a computer, including embedded systems • Understanding the CPU role • What affects the performance of the CPU • Primary memory, including; RAM, ROM, Cache and Registers • Secondary storage, including; Optical, magnetic, solid state and Cloud • Application vs system software • The roles of the operating system • Identify and utilise logic gate symbols to create logic diagrams	**GCSE CS P1 – Programming (Next Steps):** In this unit, pupils will develop the following knowledge: • Creating programs using iteration (While and For loops) • Using trace tables to follow a loop • Nested selection and iteration • Methods of data validation • Using pseudocode to plan a program • Creating programs using subroutines • Using functions • Using arrays • Using records	**GCSE CS P1 – Computational Thinking (Algorithms):** In this unit, pupils will develop the following knowledge: • Understand the term algorithm • Understand the use of decomposition & abstraction • Representing algorithms using pseudocode and flowcharts • Be able to read and follow algorithms, in terms of input, process and output • Understand the purpose of different algorithms • Use and compare linear and binary search • Use and compare the merge and bubble sort	**GCSE CS P1 – Computational Thinking (Data Representation):** In this unit, pupils will develop the following knowledge: • Use the different number bases; decimal, binary and hex • Understand how binary and hex are used • Convert values between the different number bases • Understand the different levels of size; bit, byte, KB, MB, GB, TB • Perform binary arithmetic • Apply binary shifts • Understand the use of character sets • Representing images • Representing sound • Data compression	**GCSE CS P2 – Networks and Cyber Security:** In this unit, pupils will develop the following knowledge: • Advantages & disadvantages of networks • PAN, LAN and WAN • Wired vs wireless • Topologies – star vs bus • Protocols • Understand the uses of common protocols • Describe the 4 layer TCP/IP model • Importance of cyber security • Understand the key threats to a network • Understand use of penetration testing • Understand the use of social engineering • Understand the key security measures

	Prior Knowledge	This will build on the programming units from year 7, 8 and 9. Students will be expected to show a level of competence and independence when programming solutions to small problems.	This will build on the year 7 unit on computer systems which looked at computer hardware and software. This will develop student understanding in the use of key computer components.	This will build on the programming units from year 7, 8 and 9. Students will be expected to show a level of competence and independence when programming solutions to small problems.	This topic will take some understanding of flowcharts and pseudocode from the programming units in Y7, 8 and 9.	This topic will build on prior learning from Year 8 on Computational Thinking, where pupils learnt the basics of using number bases, binary addition and character sets.	This topic will build on prior learning from Year 9 on computer networks, where pupils learnt the basics of networking computers, types of network, hardware and topologies, and cyber security in Y8.
	Assessment	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions
	Key Vocabulary	Data Type, Integer, Real, Boolean, Character, String, Variable, Constant Declaration, Assignment, Input, Output, Concatenation, Expressions, Selection, Random	Architecture, Hardware, Software, Logic Gate, Truth Table, Boolean, System, Application, Operating System, Machine Code, Interpreter, Compiler, Assembler, Translator, CPU, Von Neumann, Register, Cache, Volatile, Cloud, Embedded	Iteration, Nested, Sub-Routine, Function, Arithmetic, Boolean, WHILE, FOR, Array, Record, Concatenation, Character	Algorithm, Pseudocode, Flowchart, Decomposition, Abstraction, Inputs, Processes, Outputs, Efficiency, Linear, Binary, Merge, Bubble	Binary, Decimal, Hexadecimal, Bit, Byte, Kilobyte, Megabyte, Gigabyte, Terabyte, Binary Shift, Encoding, Character-Set, Pixel, Bitmap, Analogue, Sample, Resolution, Compression, Lossy, Lossless, Huffman Tree	Network, Packet, Personal / Local / Wide Area Network, Topology, Star, Bus, Router, Ethernet, WiFi, Bluetooth, Hub, Switch, Protocol, Transmission, Authentication, Encryption, Firewall, MAC Filtering

Year 11	**Content, Knowledge & Skills**	**GCSE CS P2 – Ethical, Legal and Environmental Impact:** In this unit, pupils will develop the following knowledge: • Explain a range of ethical, legal and environmental impacts of digital technology • Know the risks the technologies pose • Topics covered will be cyber security, mobile tech, wireless, cloud storage, hacking, wearable tech, computer-based implants, autonomous vehicles	**GCSE CS P2 - Databases:** In this unit, pupils will develop the following knowledge: • Understand the use of relational databases • Be able to utilise the key elements of a database; Tables, records, fields, data types, primary keys & foreign keys • Understand the concept of data redundancy • Use SQL to retrieve data from a database • Use SQL to insert, edit and delete data in a database	**GCSE CS P1 – Robust and Secure Programming:** In this unit, pupils will develop the following knowledge: • Be able to write a validation routine and authentication routine • Know what testing means in the context of a program • Understand what test data is and types of test data • They will know the different types of error that can occur in a computer program • Identify errors in an algorithm or program	**GCSE Computer Science Revision:** This time will be utilised to revise a variety of topics. These topics will be chosen based on pupil's performance in the Nov and Feb mock exams in response identified areas of weakness. We will also concentrate on improving methods of revision and exam technique.	**GCSE Computer Science:** Revision and Preparation for Summer Exams – Expected completion early May.
	Prior Knowledge	Pupils will build on their own personal experiences of using technology, which will vary from pupil to pupil, and the work they did in Y9 HT1 when discussing the use of some common modern technology.	This topic builds on pupil's learning in Y8, HT5. They will already have a basic understanding of the key elements, including limited experience with SQL, and will build on this experience during this unit.	This topic will build on prior learning from Year 8, 9 and 10 on the use of Python as a programming language. Students will learn to use their coding skills to program independent solutions to small computing problems.	This time will be spent preparing for final exams. The lessons at this time will be reviewing all topics covered over the Computer Science course.	This time will be spent preparing for final exams. The lessons at this time will be reviewing all topics covered over the Computer Science course.

	Assessment	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson Summative end of unit assessment task using past paper exam questions	Formative assessment in lesson
	Key Vocabulary	Ethical, Legal, Environmental, Impact, Society, Cloud, Autonomous, Implant, Hacking, Wearable Technology	Database, Relational Database, Table, Record, Field, Primary Key, Foreign Key, Data Redundancy, SQL	Validation, Authentication, Testing, Normal (Typical), Boundary (Extreme), Erroneous, Syntax Error, Logical Error	Key Terms from across course	Key Terms from across course