CARR HILL HIGH SCHOOL
Commitment Aspiration Resilience Respect

Timeline	Topic	Key concepts and knowledge	Skills development	Rationale
Autumn 1 into Autumn 2 – approx. 9 lessons	Unit 1 – Business Literacy	Students know: • How do businesses use computers to help them make decisions? Students know how to: • create spreadsheets using formulas to calculate profit/loss and cashflow • create and search a database National Curriculum Coverage: • 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	Employability skills – finance skills, IT skills, administration skills Excel skills, Access skills Numeracy skills Exam skills – evaluating the result of the computer performances Careers links – Business management, administration, accountant, customer services manager)	Following the year 8 curriculum students have a gasp of what computers are, how they communicate and how text programming helps to solve real world problems, this unit now focuses on IT skills which are highly desirable by employers. By exploring real world problems students can identify how computers are used as a management tool to make strategic decisions within business. The unit provides learners with real-life situations where the use of computers supports the efficient analysis of data to make decisions. By understanding how humans use data generated by computers and how this makes the process more efficient will allow learners to go on and explore searching and sorting algorithms used by computers to manage data.

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Autumn 2 into Spring 1 – approx. 9 lessons	**Unit 2 – Python 3**	Students know: • How do we use lists to store and retrieve data in Python? • How do we manipulate strings in Python? • What the difference is between a function and a procedure and how this help to create effective and efficient programs? Students know how to: • use lists and string manipulation to create programs • to develop 1D and 2D arrays • explain the difference between a function and procedure • to develop basic programs in Python for a specific function National Curriculum Coverage: • 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	Literacy skills Problem solving skills IT skills Investigation Self-management Oracy Communication Literacy Numeracy Creativity Problem solving Summarize Recall Programming skills Careers link: Discuss careers relating to programming including software developer, cyber security Extra-curricular: Use of micro:bits and Scratch to illustrate how the programming constructs are relevant to different programming languages	This unit builds on previous learning of the main programming constructs to introduce lists, arrays and functions, allowing learners to develop more complex programs to increasing difficult problems. Students will consolidate their programming skills throughout this unit allowing them an opportunity to apply computational thinking skills to solve real life problems with the use of Python programming.

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Spring 2 – approx. 7 lessons	Unit 3 – Searching and sorting algorithms	Students know: • How do computers search data? • How do computers sort data? • How can computers be more efficient at searching and sorting data compared to humans? Students know how to: • explain the methods of searching and sorting algorithms used by computers • perform bubble, merge and insertion sorts. • Identify search flowchart algorithms National Curriculum coverage: • 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	Numeracy skills Problem solving skills IT skills Investigation Self-management Oracy Communication Literacy Numeracy Creativity Problem solving Summarize Recall Careers links: data managers Extra-curricular – coding club to program sorts in python	The searching and sorting algorithms builds on previous understanding of computational thinking skills, with specific focus on algorithms. This unit starts the year with students using their logic and numeracy skills. These logic skills will help to introduce concepts in unit 4- logic gates. Students will also understand how data can be manipulated using computers to organise and assess data, allowing learners to appreciate the positive impact that computers can have on daily routines.

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Summer 1 – approx..6 lessons	Unit 4 – Logic Gates and back to the future	Students know: • What are logic gates? • How are truth tables used to predict outcomes from logic gates? • How have past pioneers help to shape the changing world of technology today? • What is encryption and why is it important? Students know how to: • explain the use of AND, OR and NOT gates • to predict the outcome for AND, OR and NOT gates for given inputs • to complete a truth table to predict outcomes from truth tables • describe the work of Alan Turing, Charles Babbage and George Boole and their achievements in computing • encrypt and decrypt data using a cipher key National Curriculum Coverage: • understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming	Numeracy skills Logical skills Digital literacy Sequencing and order Identifying control systems Literacy skills including writing and reading. Numeracy skills – use of time Computational thinking skills Programming skills – using logic.ly Careers links – electrical engineers British Values – mutual respect, tolerance, individual liberty through exploring Alan Turing and how he was persecuted for his sexuality despite the huge impact he had on cutting short the second world war and saving millions of lives	Students explore this short unit introducing them to logic gates, which builds on their understanding of binary and that computers are made up of transistors representing on and off. There are cross curricular links with Physics and their learning of electrical circuits and the use of gates to control the flow of electricity. It follows on from previous Python units and builds on the logic of inputs and specified outputs. This unit develops logic skills whilst exploring pioneers of past computing achievements. Students can reflect on how widespread the use of computers are in everyday life and help them recognise the importance of understanding how computers work in their future careers.

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Summer 2 – approx. 4 lessons	Unit 5 – Data Representation	Students know: • How do computes represent images, sound and letters? • How does the resolution/sample/character set impact on file size and storage requirements? Students know how to: • explain how ASCII and Unicode represents letters • Explain how images can be stored as either bitmap or vector images • explain how sound is stored digitally using sampling National Curriculum Coverage: • 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	Numeracy skills Problem solving skills IT skills Investigation Self-management Oracy Communication Literacy Numeracy Creativity Problem solving Summarize Recall Careers links – sound engineer, data analyst / Big Bang Digital event	This final unit allows students to build on their understanding of how numbers and images are represented in binary but extending the learning to sound and letters. This final unit aims to bring together some of the core skills and knowledge around how computers are used across a number of industries and fields, whilst developing employability and digital literacy skills to help them in their next step in their learning journey at Carr Hill.