Sheldon School
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Curriculum Plan
KS4 – Computer Science
Year 11

Golden Threads	Enrichment	Review and Evaluation
To be familiar with the hardware and software components that make up a computer system To understand the key principles behind the organisation of computer networks Developing the skill of computer programming – designing, reading, writing and debugging programmes	After school coding support club	Summer 2026

	Topics & Substantive Knowledge	Disciplinary Knowledge	Assessment	Misconceptions	Key Vocabulary	Knowledge Tracking
Term 1	4.1 Networks 6 Problem solving with programming 3.1.3 understand the concept of an embedded system and what embedded systems are used for 4.1.3 understand how the internet is structured (IP addressing, routers) 4.1.6 understand the role of and need for network protocols (Ethernet, Wi-Fi, TCP/IP, HTTP, HTTPS, FTP) and email protocols (POP3, SMTP, IMAP) 4.1.7 understand how the 4-layer (application, transport, internet, link) TCP/IP model handles data transmission over a network	6.6.1 be able to write programs that use pre-existing (built-in, library) and user-devised subprograms (procedures, functions) 6.6.2 be able to write functions that may or may not take parameters but must return values, and procedures that may or may not take parameters but do not return values 6.6.3 understand the difference between and be able to write programs that make appropriate use of global and local variables	5 question MCQ retrieval at the start of each lesson Term 1 Week 7 short answer questions	The Internet is one network rather than a series of linked networks The role of protocols to ensure that different devices are able to communicate	Data packet Encapsulation Ethernet FTP – File Transfer Protocol Handshake IP address IPv4 – Internet Protocol version 4 IPv6 – IP version 6 IMAP – Internet Message Access Protocol MAC (Media Access Control) address Packet switching POP3 – Post Office Protocol version 3 Protocol SMTP – Simple Mail Transfer Protocol TCP/IP – Transmission Control Protocol / Internet Protocol	
Term 2	3.3 Programming languages 5.1 Environmental 6 Problem solving with programming 1.2.6 understand how standard algorithms (bubble sort, binary search) work 3.3.1 understand the characteristics and purposes of low-level and high-level programming languages 3.3.2 understand how an interpreter differs from a compiler in the way it translates high-level code into machine code 5.1.1 understand environmental issues associated with the use of digital devices (energy consumption, manufacture, replacement cycle, disposal)	1.2.4 be able to determine the correct output of an algorithm for a given set of data and use a trace table to determine what value a variable will hold at a given point in an algorithm 6.1.5 be able to identify, locate and correct program errors (logic, syntax, runtime)	5 question MCQ retrieval at the start of each lesson Week 7 short answer questions	Computers are always negative for the environment	Assembler Assembly language Compiler Interpreter High level languages Low level languages Machine code Opcode Translator Virtual machine	

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	Topics & Substantive Knowledge	Disciplinary Knowledge	Assessment	Misconceptions	Key Vocabulary	Knowledge Tracking
Term 3	2.2 Data representation 3.2 Data Storage and Compression 6 Problem solving with programming 2.2.2 understand how bitmap images are represented in binary (pixels, resolution, colour depth) 2.2.3 understand how analogue sound is represented in binary (amplitude, sample rate, bit depth, sample interval) 2.2.4 understand the limitations of binary representation of data when constrained by the number of available bits 2.3.2 understand the need for data compression and methods of compressing data (lossless, lossy)	6.3.1 be able to write programs that make appropriate use of primitive data types (integer, real, Boolean, char) and one-dimensional structured data types (string, array, record) 6.3.2 be able to write programs that make appropriate use of variables and constants 6.3.3 be able to write programs that manipulate strings (length, position, substrings, case conversion)	5 question MCQ retrieval at the start of each lesson Mock exam (Paper 1 and Paper 2)	Audio, image and video files are not simply made up of binary data	Analogue Bit depth Bit rate Bitmap Colour depth Metadata Pixel Resolution Sample rate Sampling Vector	2.2 links to 2.1
Term 4	5.2 Ethical and legal 6 Problem solving with programming 5.2.1 understand ethical and legal issues associated with the collection and use of personal data (privacy, ownership, consent, misuse, data protection) 5.2.2 understand ethical and legal issues associated with the use of artificial intelligence, machine learning and robotics (accountability, safety, algorithmic bias, legal liability) 5.2.3 understand methods of intellectual property protection for computer systems and software (copyright, patents, trademarks, licencing)	6.3.1 be able to write programs that make appropriate use of primitive data types (integer, real, Boolean, char) and two-dimensional structured data types (string, array, record) 6.3.2 be able to write programs that make appropriate use of variables and constants 6.6.1 be able to write programs that use pre-existing (built-in, library) and user-devised subprograms (procedures, functions) 6.6.2 be able to write functions that may or may not take parameters but must return values, and procedures that may or may not take parameters but do not return values 6.6.3 understand the difference between and be able to write programs that make appropriate use of global and local variables	5 question MCQ retrieval at the start of each lesson Week 6 short answer questions	AI is either completely negative (influenced by media such as The Terminator) or positive There are no laws that govern the Internet	Algorithmic bias AI – Artificial Intelligence Computer Misuse Act Computer, Designs and Patents Act Create Commons Data Protection Act Encryption Freedom of Information Act License Open source Proprietary	5.2 links to 5.1

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Term 5	Exam Preparation					