

# YEAR 9 LONG TERM PLAN with CURRICULUM STANDARDS

## COMPUTER SCIENCE THEORY

YEAR 9	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 1	YR9/1 (2)	YR9/2 (2)	YR9/3 (2)	YR9/4 (2)	YR9/5 (2)	YR9/6 (2)	YR9/7 (4)	
	<b>ALGORITHMS</b>							
	Introduction to algorithms	Interpreting and creating algorithms	Making use of programming constructs	Appropriate conventions	Purpose and output of an algorithm	Identify and correct errors in algorithms using trace tables	Bubble sort	
Term 1	YR9/8 (4)		YR9/9(2)	YR9/10(2)	YR9/11(2)	YR9/12(4)		YR9/13(2)
	<b>ALGORITHMS</b>				<b>DECOMPOSITION AND ABSTRACTION</b>			
	Merge sort		Linear search	Binary search	Fitness for purpose of algorithms	Analyse a problem, investigate requirements (inputs, outputs, processing, initialisation) and design solutions		Decompose a problem into smaller sub-problems
YEAR 9	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 2	YR9/14(2)	YR9/15(2)	YR9/16(4)		YR9/17(2)	YR9/18(2)	YR9/19(4)	
	<b>DECOMPOSITION AND ABSTRACTION</b>		<b>BINARY</b>					
	Abstraction-to model aspects of the real world	Real-world examples	Data representation (numbers, text, sound, graphics) and program instructions in binary		Computers represent and manipulate numbers (unsigned integers, signed integers (sign and magnitude, two's complement))	Convert between binary and denary whole numbers (0-255)	Binary arithmetic and the concept of overflow	
Term 2	YR9/20(4)		YR9/21(4)		YR9/22(2)	YR9/23(2)	YR9/24(4)	
	<b>BINARY</b>		<b>DATA REPRESENTATION</b>					
	Hexadecimal notation and to convert between hexadecimal and binary		Computers encode characters using ASCII and Unicode		Bitmap images are represented in binary (pixels, resolution, colour depth)	How sound, an analogue signal, is represented in binary	The limitations of binary representation of data	

## COMPUTER SCIENCE PRACTICAL

YEAR 9	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 1	YR9/P1 (2)	YR9/P2(2)	YR9/P3(2)	YR9/P4(2)	YR9/P5(2)	YR9/P6(2)	YR9/P7 (4)	
	<b>ALGORITHMS</b>				<b>DEVELOP CODE</b>			
	Introduction to algorithms	Interpreting and creating algorithms	Making use of programming constructs and appropriate conventions	To code an algorithm in a high-level language	The choice of algorithm and data values that need to be manipulated	write programs in a high-level programming language	To improve readability and to explain how the code works	
Term 1	YR9/P8 (4)		YR9/P9 (4)		YR9/P10 (4)		YR9/P11 (4)	
	<b>DEVELOP CODE</b>							
	Types of error in programs (logic, syntax, runtime)		To design and use test plans and test data (normal, boundary, erroneous)		Interpret error messages and identify, locate and fix errors in a program		Trace table	

YEAR 9	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 2	YR9/P12 (4)		YR9/P13 (4)		YR9/P14 (4)		YR9/P15 (4)	
	<i>DEVELOP CODE</i>				<i>CONSTRUCTS</i>			
	Trace table		Determine the strengths and weaknesses of a program and suggest improvements.		Structural components of a program - variable and type declarations		Structural components of a program - command sequences, selection, iteration	
	YR9/P16 (4)		YR9/P17 (4)		YR9/P18 (4)		YR9/P19 (4)	
	<i>CONSTRUCTS</i>							
Structural components of a program - command sequences, selection, iteration		Structural components of a program - data structures, subprograms		Structural components of a program - data structures, subprograms		Sequencing, selection and iteration constructs		

**YEAR 10 LONG TERM PLAN with CURRICULUM STANDARDS**  
**COMPUTER SCIENCE THEORY**

YEAR 10	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 1	YR10/1(2)	YR10/2(2)	YR10/3(2)	YR10/4(2)	YR10/5(2)	YR10/6(4)		YR10 / 7(2)
	<i>DATA STORAGE AND COMPRESSION</i>				<i>ENCRYPTION</i>			<i>MACHINES AND COMPUTATIONAL MODELLING</i>
	To use and convert between binary and denary multiples	The need for data compression and methods of compressing data	Lossless, run-length encoding (RLE) algorithm	File storage - measured in bytes and be able to calculate file sizes	The need for data encryption	Encryption algorithms		The input-process-output model and the range of computational models
Term 1	YR10/8(2)	YR10/9(4)		YR10/10(2)	YR 12/11(2)	YR 10/12(2)	YR 10/13(2)	YR 10/14(2)
	<i>HARDWARE</i>					<i>LOGIC</i>		<i>SOFTWARE</i>
	The function of the hardware components of a computer system and how they work together and the function of different types of memory	The concept of a stored program and the role of components of the CPU in the fetch-decodeexecute cycle (the Von Neumann model) and the factors that affect the performance of the CPU		'cloud' and other contemporary secondary storage	The need for embedded systems and their functions	To construct and interpret truth tables for a given logic statement (AND, OR, NOT)	To produce logic statements for a given problem	Operating system and how it manages files, processes, hardware and the user interface

YEAR 10	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 2	YR10/15(2)	YR10/16(2)	YR10/17(2)	YR10/18(2)	YR10/19(2)	YR10/20(2)	YR10/21(2)	YR10/22(2)
	<b>SOFTWARE</b>		<b>PROGRAMMING LANGUAGES</b>		<b>NETWORKS</b>			
	The purpose and functions of utility software	Software to simulate and model aspects of the real world, system software and application software	High-level and low-level programming languages and suitability for a particular task	Assembler, compiler and an interpreter and the advantages and disadvantages of each	Network, different types of networks and usage models	Wired and wireless connectivity	Network data speeds, the role of and need for network protocols	Data transmission and the 4-layer TCP/IP model
Term 2	YR10/23(2)	YR10/24(2)	YR10/25(2)	YR10/26(2)	YR10/27(2)	YR10/28(2)	YR10/29(2)	YR10/30(2)
	<b>NETWORKS</b>		<b>NETWORK SECURITY</b>			<b>THE INTERNET AND THE WORLD WIDE WEB</b>		
	Characteristics of network topologies	Different mobile communication standards	Appropriate validation and authentication techniques and security issues	Different forms of cyber attack	Identifying vulnerabilities, review of network, user policies and protect software systems from cyber attacks	Internet, WWW and components of the WWW	IP addressing, IPv4, IPv6	The role of components used to access the internet

## COMPUTER SCIENCE PRACTICAL

YEAR 10	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 1	YR10/P1 (4)		YR10/P2 (4)		YR10/P3 (4)		YR10/P4 (4)	
	<b>DATA TYPES AND STRUCTURES</b>							
	Data types (integer, real)		Data types (Boolean, char, string)		Data structures (records, one-dimensional arrays)		Data structures (two-dimensional arrays)	
Term 1	YR10/P5 (4)		YR10/P6 (4)		YR10/P7 (4)		YR10/P8 (4)	
	<b>DATA TYPES AND STRUCTURES</b>							
	Strings		Variables and constants		Global and local variables when implementing subprograms		Global and local variables when implementing subprograms	

YEAR 10	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 2	YR10/P9 (4)		YR10/P10 (4)		YR10/P11 (4)		YR10/P12 (4)	
	<b>INPUT/OUTPUT</b>							
	Write code that accepts and responds user input		Validation		Write code that reads/writes from/to a text file		Arithmetic operators (add, subtract, divide, multiply, modulus, integer division)	
	YR10/P13 (2)	YR10/P14 (6)			YR10/P15 (4)		YR10/P16 (4)	
	<b>OPERATORS</b>							
	Arithmetic operators (add, subtract, divide, multiply, modulus, integer division)	Relational operators (equal to, less than, greater than, not equal to, less than or equal to, greater than or equal to)			Logic operators (AND, OR, NOT)		Logic operators (AND, OR, NOT)	

## YEAR 11 LONG TERM PLAN with CURRICULUM STANDARDS

### COMPUTER SCIENCE THEORY

YEAR 11	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 1	YR11/1(4)		YR11/2(4)		YR11/3(4)		YR11/4(4)	
	<b>EMERGING TRENDS, ISSUES AND IMPACT</b>							
	The environmental impact of technology (health, energy use, resources) on society		The ethical impact of using technology (privacy, inclusion, professionalism) on society		The legal impact of using technology (intellectual property, patents, licensing and cyber-security)		Current and emerging trends in computing technology (quantum computing, DNA computing, artificial intelligence (AI), nanotechnology)	
Term 1	YR11/5(4)		YR11/6(4)		YR11/7(4)		YR11/8(4)	
	<b>REVISION</b>							
	Revision on Topic 1: Problem solving		Revision on Topic 3: Data		Revision on Topic 4: Computers		Revision on Topic 5: Communication and the internet	
YEAR 11	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
Term 2	YR11/9(4)		YR11/10(4)		YR11/11(4)		YR11/12(4)	
	<b>REVISION</b>							
	REVISION - PAST PAPERS/SAMPLE PAPER		REVISION - PAST PAPERS/SAMPLE PAPER		REVISION - PAST PAPERS/SAMPLE PAPER		REVISION - PAST PAPERS/SAMPLE PAPER	

## COMPUTER SCIENCE PRACTICAL

YEAR 11	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	
	YR11/P1(2)	YR11/P2 (6)			YR11/P3(4)		YR11/P4 (4)		
	<b>SUBPROGRAMS</b>								
	Benefits of using subprograms	Write code that uses user-written and pre-existing (built-in, library) subprograms			Passing data into and out of subprograms (procedures, functions)		Create subprograms that use parameters		
	YR11/P5(2)	YR11/P6(4)		YR11/P7(2)	YR11/P8(4)		YR11/P9(4)		
	<b>REVISION</b>								
	Revision on Topic 2: Programming (2.1 Develop code)		Revision on Topic 2: Programming (2.2 Constructs)		Revision on Topic 2: Programming (2.3 Data types and structures and 2.4 Input/output)		Revision on Topic 2: Programming (2.5 Operators and 2.6 Subprograms)		
YEAR 11	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	
Term 2	YR10/P10(4)		YR11/P11(4)		YR11/P12(4)		YR11/P13(4)		
	<b>REVISION</b>								
	REVISION - PAST PAPERS/SAMPLE PAPER			REVISION - PAST PAPERS/SAMPLE PAPER		REVISION - PAST PAPERS/SAMPLE PAPER		REVISION - PAST PAPERS/SAMPLE PAPER	