Year: 10	Aspect of CS: **Systems**	Assessment:	Resources:	Key Vocabulary:

Year: 10

Unit: Unit 1

Aspect of CS: **Systems**

Focus: **Hardware & Software**

Assessment:

Regular homework tasks (online self-marking and formally assessed).
Topic test at the end of each sub-topic.

Resources:
• Outside space
• Videos
• Old PCs
• Lego bricks
• Range of stationary

Key Vocabulary:
• CPU
• Memory
• Network
• Protocol
• Malware
• Von Neumann
• Data
• RAM
• ROM
• Secondary storage

KS3 National Curriculum Developments Being Built Upon:

• understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems

• 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

• understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns

Theoretical concepts:
• Von Neumann Architecture
• Communication protocols
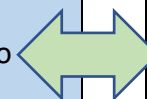• Data storage
• Security threats

Related learning in other subjects:
• English literature
• MFL

Practical opportunities:
• Building PCs
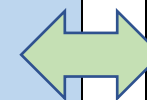• Paired & group practical activities to support theory

Related learning in other subjects:
• DT
• PE

Problem solving opportunities:
• Algorithms used in network communication protocols
• Range of problem solving tasks throughout unit to build skills

Related learning in other subjects:
• Maths
• PE
• Science

Key Concepts:
• Structure & role of the CPU
• How data is stored in memory
• Networks
• Data security
• Legal, ethical & environmental issues in CS

Week	Lesson	Topic	Lesson content
1	1	Unit 1 - Systems Architecture	History of computers
	2		History of computers
	3		Purpose of the CPU
2	4		CPU performance factors
	5		Inside the CPU
	6		Von Neumann architecture
3	7		Von Neumann architecture
	8		Embedded systems
	9		Map trail & report
4	10		Systems architecture test
	11	Unit 1 - Memory	Difference between RAM & ROM
	12		Difference between RAM & ROM
5	13		Difference between RAM & ROM
	14		Virtual Memory
	15		Cache Memory
6	16		Memory Booklet
	17		Memory Booklet
	18		Memory Test
7	19	Unit 1 - Storage	Secondary storage
	20		Storage capacities
	21		Storage capacities
8	22		Storage capacities
	23		Hard disk buyer's guide
	24		Hard disk buyer's guide
9	25		Revision
	26		Storage test
10	27	Unit 1 - Wired & Wireless Networks	Introduction to networking
	28		Types of network
	29		WAN & LAN
	30		WAN & LAN
11	31		Network Protocols
	32		The Internet
	33		Revision
12	34	Unit 1 - Network topologies, protocols and layers	Network topologies
	35		Network topologies limitations
	36		Layers and Factors affecting network performance
13	37		Network performance
	38		Packets and packet switching
	39		Network communications
14	40		Revision
	41		Networks test
15	42	Unit 1 - System Security	Introduction to system security
	43		System threats
	44		Preventative measures
	45		Preventative measures
16	46	Unit 1 - System Software	System software
	47		Multi-tasking
	48		System utilities task
17	49		System utilities task
	50		System software
	51		System utilities
18	52	Unit 1 - Ethical, legal, cultural & environmental concerns	Legal issues
	53		Legal issues
	54		Key stakeholders
19	55		Environmental impact
	56		Open & closed software
	57		Cultural implications
20	58		Test
	59	Unit 3 - Programming Project	Introduction to Python / Lists
	60		IF statements / Flow charts
21	61		Car sales
	62		Simple programs
	63		Simple programs
22	64		Rock paper scissors
	65		Dice roll
	66		Tax calculator
23	67	Unit 2 - Algorithms	Computational thinking & abstraction
	68		Abstraction
	69		Decomposition & algorithmic thinking
24	70		Creating algorithms
	71		Creating algorithms
	72		Searching
25	73		Searching
	74		Sorting
	75		Sorting
26	76		Sorting
	77		Interpret, complete & correct algorithms
	78		Interpret, complete & correct algorithms

Year: 11

Unit: Unit 2

Aspect of CS: **Algorithms**

Focus: **Computational thinking & programming**

Assessment:

• Regular homework tasks (online self-marking and formally assessed).
• Topic test at the end of each sub-topic.
• Practical programming project.

Resources:
• IDLE
• Lego bricks
• YouTube videos

Key Vocabulary:
• Sorting
• Algorithm
• Syntax
• Logic
• Gate
• Boolean
• Translator
• Interpreter
• Binary
• Shifts
• Character set
• Rasterise

KS3 National Curriculum Developments Being Built Upon:

• design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems

• 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

• use 2 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

• understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal]

• 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

Theoretical concepts:
• Computational logic
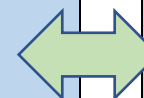• Representation of data
• Translation & Interpretation
• Abstraction
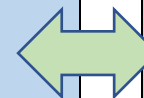
Related learning in other subjects:
• Maths
• English
• DT

Practical opportunities:
• Programming problems
• Data conversions
• Creating logic circuits
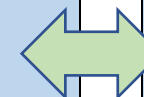
Related learning in other subjects:
• Electronics
• Maths
• Science

Problem solving opportunities:
• Programming problems
• Data conversions
• Algorithmic thinking
• Abstraction problems

Related learning in other subjects:
• Maths
• Science

Key Concepts:
• Algorithmic thinking
• Logic gates
• Number conversions
• Programming techniques
• Program design considerations

Week	Lesson	Topic	Lesson content	
1	1	Producing robust programs	Defensive design considerations	
	2		Maintainability	
2	3		Testing	
	4		Variables	
	5		Sequence, selection & iteration	
3	6		String manipulation	
	7		Basic handling operations (open, read, write, close)	
4	8		Using records to store data	
	9		Review activity	
	10		SQL	
5	11	Programming technniques (including Python)	Use of arrays	
	12		Use of sub-programs (functions & procedures)	
6	13		Use of data types	
	14		Arithmetic operators	
	15		Boolean operators	
7	16		Review	
	17		Practical activity	
8	18		Practical activity	
	19		Practical activity	
	20			
9	21			
	22			
10	23			
	24			
	25			
11	26			
	27			
12	28			
	29			
	30			
13	31	CAT		
	32			
14	33			
	34			
	35			
15	36			
	37			
16	38			
	39			
	40			
17	41	CAT FLOAT TIME		
	42	CAT FLOAT TIME		
	43	CAT FLOAT TIME		
18	44		Units	
	45		Numbers - denary to binary	
19	46		Numbers - denary to binary	
	47		Numbers - binary addition	
20	48		Binary shifts	
	49		Hex	
	50		Hex conversions	
21	51	Representation of data	Binary to hex	
	52		Numbers revision	
22	53		Characters	
	54		Images	
	55		Sound - sampling	
23	56		Compression	
	57		Revision	
24	58		Test	
	59		Programming languages and translators	
	60	Translators & Facilities of languages	Assembler, compiler, interpreter	
25	61		IDEs	
	62		Test	
26	63		Representing data in binary form	FINAL DEADLINE FOR SUBMISSION OF CAT MARKS
	64		Logic diagrams	
	65		Logic diagrams	
27	66	Computational logic	Boolean operators	
	67		Truth tables	
28	68		Test	
	69			
	70			
29	71			
	72	REVISION		
30	73			
	74			
	75			
31	76	UNIT 1 EXAM		
	77	UNIT 2 EXAM		
32	78	NO LESSON - COURSE FINISHED		
	79	NO LESSON - COURSE FINISHED		
	80	NO LESSON - COURSE FINISHED		