

## Co-op Academy Leeds Year 11: OCR Computer Science - Long Term Plan 2024-25

All lessons will follow the Co-op Academy Lesson Journey and include a (retrieval) Do Now, Lesson Intentions, Success Criteria, Explicit Instruction, Quality Time/Practice, Review

ROLLOVER					
Week	37	38	39	40	41
W/C Date	24-Jun 23	01-Jul 23	08-Jul 23	15-Jul 23	22-Jul 23
Specification	Programming (1) Introduction To Python Programming – I				
Topic	Program Flow				
	algorithms	Sequence	Selection	Iteration	Trace Tables
Key Objectives	state the flow diagram shapes that represent programming constructs	plan a sequence of instructions for a program in python	plan selection in set of instructions using Boolean data types and IF, THEN, and ELSE IF statements	plan iteration in a set of instructions using FOR – NEXT; REPEAT-UNTIL; WHILE-ENDWHILE	explain dry run testing using trace tables of changing variables
	create an algorithm using a flow-diagram	create a sequence of instructions for a program in python	create a selection using Boolean data types, expressions and IF and ELSE IF statements	create iteration in a set of instructions using FOR – NEXT; REPEAT-UNTIL; WHILE-ENDWHILE	trace instructions using variables, selection and repetition and predict what the result will be
	apply a flow-diagram algorithm to a given scenario	correctly execute a sequence of instructions for a program in python	correctly execute a selection using Boolean expressions and IF and ELSE IF statements	correctly execute iteration in a set of instructions using FOR – NEXT; REPEAT-UNTIL; WHILE-ENDWHILE	rectify instructions involving variables, selection and repetition and make it more efficient
Retrieval / Assessment / DC				EXAM QUESTIONS	DIRT

### Department of Computer Science and ICT

#### Retrieval and Assessment Key

	<b>STAR Assessment / Summative Marking</b>
	<b>Quizzes / Formative Assessment and Marking</b>
	<b>Student Voice</b>
	<b>Live Feedback inc Whole Class Feedback</b>
	<b>DIRT / Reflection</b>
	<b>Data Capture</b>
	<b>Interventions</b>

**\*\*\*The LTP has declarative (theory) and procedural (practice) knowledge and skills embedded to allow learners to successfully complete the OCR GCSE 9-1 J277 Computer Science specification.\*\*\***

#### **Year 11 precise powerful knowledge, understanding and skills to be developed:**

To know what computational thinking consists of and its application in algorithms and python programming

To develop understanding of sequence, arithmetic, relational and Boolean operators, selection, iteration, lists, tuples, arrays, file handling.

To develop competence to write code in python

To develop problem solving skills in python programming

To develop robust programmes

To know high and low programming languages

To know the processes that take place in the CPU in the form of the fetch, decode and execute cycle

To know and understand the purpose and functions of the components of the CPU

To know and understand the memory and storage components and process in a computer system

To know and understand specific network threats and specific security solutions

To know the different types of software and their purpose within a computer system • To know how data is represented via binary, denary, hexadecimal, ASCII and sound

To develop critical reflection skills in application of technology and its ethical, legal, cultural, and environmental considerations

To know how to answer exam questions

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Week	1	2	3	4	5	6	7	8		9	10	11	12	13	14	15	
W/C Date	02-Sep	09-Sep	16-Sep	23-Sep	30-Sep	07-Oct	14-Oct	21-Oct		04-Nov	11-Nov	09-Nov	25-Nov	02-Dec	09-Dec	16-Dec	
Specification	Programming (2) Algorithms			Programming (2) Python Programming							Programming (2) Producing Robust Programs			Programming (2) Languages and IDEs		Programming (2) Data Representation	
Topic	Algorithmic Thinking and Problem Solving			Arrays, Tuples, Lists, and Dictionaries (1D and 2D)			File Handling Operations			Defensive Design	Testing	Assessment	Levels of programming	IDE Tools			
	Principles of computational thinking	Designing, creating and refining algorithms	Searching and sorting algorithms	Arrays	Tuples and Lists	Dictionaries	Create Open	Read	Write Close								
Key Objectives	define abstraction, decomposition and algorithmic thinking	design an algorithm using either pseudocode or flowcharts	explain the main steps to solve standard searching and sorting algorithms	define an array	define a tuple a list	define a dictionary	explain what creating and opening a file in python is	describe what reading a file in python is	explain what writing and closing a file in python is	HALF-TERM	explain anticipating misuse, authentication , input validation, and maintainability	describe the purpose and types of testing, and syntax and logical errors	algorithms lists and files	state the differences between high- and low-level programming languages	identify the tools that an IDE provides	convert Binary to Denary and denary to hexidecimal	explain binary and sound
	identify the principles of computational thinking in a given scenario	create a workable algorithm for a problem	solve standard searching and sorting algorithms	create an array in python	create a tuple and list in python	create a dictionary in python	create and open a file in python	create a program that would read a file in python	write and close a file in python		create a design with input validation, simple authentication , and maintainability	select and use suitable test data and apply in a given scenario	revision – how to answer exam questions on arrays, tuples, lists, and dictionaries	explain the need for translators	explain how the tools and facilities in an IDE can be used to develop a program	explain ASCII	calculate sound in binary
	apply the principles of computational thinking to a given scenario	refine a workable algorithm and make it efficient	apply searching and sorting algorithms to a given scenario	solve a problem involving creating and opening a file in python	solve a problem involving reading a file in python	solve a problem involving writing and closing a file in python	solve a problem involving creating and opening a file in python	solve a problem involving reading a file in python	solve a problem involving writing and closing a file in python		solve a problem related to defensive design	complete a test plan and refine an algorithm	revision – practice answering exam questions	discuss the differences, benefits and drawbacks of using a compiler or an interpreter	use a range of tools within the Python IDE	calculate ASCII	walk through mock
Retrieval / Assessment / DC	BASELINE AND SUMMER WORK ASSESSMENT				MCQS			STAR WALK TRU MOCK	DIRT		Y11 MOCK WEEK	Y11 MOCK WEEK	Y11 MOCK WEEK	DIRT		Y11 DC1	
Interventions	Python Programming Interventions (Breakfast, Lunch and After School)									Python Programming Interventions (Breakfast, Lunch and After School)							

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Week	16	17	18	19	20		21	26	27	28	29	30			31	
W/C Date	06-Jan	13-Jan	20-Jan	27-Jan	03-Feb		17-Feb	24-Feb	02-Mar	09-Mar	16-Mar	23-Mar			13-Apr	
Specification	Computer Systems (1) Hardware						Computer Systems (1): Networks and Cyber Security								Computer Systems (1): Systems Software	
Topic	System Architecture			Memory			Threats To System Security								Computer Systems (1): Functions of Operating Systems	
	CPU	CPU Performance	Embedded Systems	Primary	Secondary		Units	Network types and topologies	Protocols and Layers	Network Threats & Malware	Social Engineering	Securing A Vulnerable Network				
Key Objectives	Explain the purpose of the CPU (FDE Cycle)	Describe clock speed, cache size and number of cores	State the purpose and characteristics of embedded systems	Outline the purpose of RAM, Rom and Virtual Memory	Explain the common types of storage		Identify the different units of data storage	List the different network types and topologies	Compare benefits and drawbacks of wired versus wireless connection	Describe the different types of malware and its threat to networks	Describe the different types of user vulnerabilities	Outline the onion model to protect a network.			State the functions of operating systems	
	Outline the common CPU components and their purpose	Explain how the characteristics of the CPU affect system performance	Explain the function oof an embedded system	Explain the characteristics of RAM and ROM	Identify the storage devices and storage media for a given application	HALF-TERM	Calculate storage capacity for a given set of files	Explain the different network types and topologies	Explain the need for standards	Demonstrate how malware can affect computer networks	Demonstrate how user vulnerabilities can affect computer networks	Explain the variety of methods used to protect a network		HALF-TERM	HALF-TERM	Explain the features of each function of an operating system
	Explain the on Neumann Architecture	Advice a client on the characteristics of the CPU and its effect on system performance	Compare an embedded system with a non-embedded system	Compare RAM and ROM	Discuss the advantages and disadvantages of different storage devices and storage media relating to these characteristics		Calculate file sizes of sound. Images and text.	Assess the positives and negatives of the different network types and topologies	Discuss the different types of protocols and their purposes	Evaluate the impact of malware on a network	Assess the impact of user vulnerabilities	Appraise a scenario involving a vulnerable network by suggesting solutions				Apply functions of operating systems to given scenarios
Retrieval / Assessment / DC	EXAM QUESTIONS	DIRT		EXAM QUESTIONS	DIRT			EXAM QUESTIONS	DIRT	STAR MOCK EXAM	Y11 DC2	DIRT				
Interventions	Post Assessment Python Programming and Hardware Interventions (Breakfast, Lunch and After School)						Post Assessment Python Programming and Hardware Interventions (Breakfast, Lunch and After School)									

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Week	32	33	34	35	36		40	41	42		43	44	45	46	
W/C Date	20-Apr	27-Apr	04-May	11-May	18-May		01-Jun	08-Jun	10-Jun		22-Jun	01-Jul	06-Jul	13-Jul	
Specification	Computer Systems (1): Systems Software	Computer Systems (1): Ethical, legal, cultural and environmental impacts of digital technology		Exam Techniques	Exam Techniques		Exam Techniques	Exam Techniques	Exam Techniques						
Topic	Utility Software	“Do Androids’ Dream of Electric Sheep?”	Ethical, Legal, Cultural and Environmental Issues	Exam Techniques	Exam Techniques		Exam Techniques	Exam Techniques	Exam Techniques						
Key Objectives	Describe the purpose of encryption software	Machine Learning: ChatCPT, Amazon Go, Killer Drones and Self-Driving Cars	Outline the ethical, legal, cultural and environmental issues that arise from artificial intelligence	Walk Through Mocks	Walk Through Mocks	HALF-TERM	Walk Through Mocks	Walk Through Mocks	Walk Through Mocks	ROLLOVER					
	Explain defragmentation and data compression	Define machine learning	Explain the ethical, legal, cultural and environmental arguments for and against artificial intelligence	Walk Through Mocks	Walk Through Mocks		Walk Through Mocks	Walk Through Mocks	Walk Through Mocks		Walk Through Mocks				
	Assess the purpose of utility software and why it is required	Explain how machine learning is different to rule-based learning	Evaluate the ethical, legal, cultural and environmental issues that arise from artificial intelligence	Walk Through Mocks	Walk Through Mocks		Walk Through Mocks	Walk Through Mocks	Walk Through Mocks		Walk Through Mocks				
Retrieval / Assessment / DC	EXAM PRACTICE	EXAM PRACTICE	STAR MARK MOCK	WALK THRU MOCK	WALK THRU MOCK				Y11 DC3						
Interventions	Exam Practice Interventions (Breakfast, Lunch and After School)						Exam Practice Interventions (Breakfast, Lunch and After School)								