Co-op Academy Leeds Year 11: OCR Computer Science - Long Term Plan 2023-24

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	26-Jun 23	03-Jul 23	010-Jul 23	17-Jul 23	24-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 Computer Science and ICT

Retrieval and Assessment Key

	STAR Assessment / Summative Marking
	Quizzes / Formative Assessment and Marking
	Student Voice
	Live Feedback inc Whole Class Feedback
	DIRT / Reflection

	Data Capture
	Interventions

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	04-Sep	11-Sep	18-Sep	25-Sep	02-Sep	09-Oct	16-Oct	23-Oct		06-Nov	13-Nov	20-Nov	27-Nov	04-Dec	11-Dec	18-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	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 sounnd 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)							

(HALF-TERM markers appear after Week 8, Week 13, and Week 15)

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Week	16	17	18	19	20		21	26	27	28	29	30			31
W/C Date	08-Jan	15-Jan	22-Jan	29-Jan	05-Feb		19-Feb	26-Feb	04-Mar	011-Mar	18-Mar	25-Mar			15-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								
	CPU	CPU Performance	Embedded Systems	Primary	Secondary		Units	Network types and topologies	Protocols and Layers	Network Threats & Malware	Social Engineering	Securing A Vulnerable Network			Functions of Operating Systems
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	HALF-TERM	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.	HALF-TERM	HALF-TERM	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		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			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	22-Apr	29-Apr	6-May	13-May	20-May		3-Jun	10-Jun	17-Jun		24-Jun	1-Jul	8-Jul	15-Jul
Specification	Computer Systems (1): Systems Software	Computer Systems (1): Ethical, legal, cultural and environmental impacts of digital technology		Exam Techniques	Exam Techniques	HALF-TERM	Exam Techniques	Exam Techniques	Exam Techniques	ROLLOVER				
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		Walk Through Mocks	Walk Through Mocks	Walk Through Mocks					
	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					
	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					
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)							