Co-op Academy Leeds Year 10: 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				
	Sequence	Selection	Iteration	Trace Tables	Assessment Week
Key Objectives	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	Revision
	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	Revision
	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	Revision
Retrieval / Assessment / DC				MCQs	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

*****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 10 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 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

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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) Python Programming – I									Programming (2) Python Programming – II								
Topic	Data types and Structures	Arithmetic, Comparison and Logical Operators	Problem Solving Decomposition	Sequence Abstraction	Selection	Iteration	Trace Tables	Assessment Week		Arrays, Tuples, Lists, and Dictionaries (1D and 2D)			File Handling Operations			Assessment Week		
										Arrays	Tuples and Lists	Dictionaries	Create Open	Read	Write Close			
Key Objectives	define the different types of data types and data structures	identify, arithmetic, comparison and logical operators	identify a problem and break it down into smaller parts.	identify a problem, break it down, and remove any unnecessary information	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	revision – How to answer exam questions		define an array	define a tuple a list	define a dictionary	explain what creating and opening a file in python is	explain what reading a file in python is	explain what writing and closing a file in python is	revision – how to answer exam questions	
	explain variables, constants,	use arithmetic, comparison and logical operators in a simple program	explain the breaking down of the problem	explain why you removed the information you did	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	revision – Practice answering exam questions	HALF-TERM	create an array in python	dreate a tuple and list in python	dreate 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	revision – practice answering exam questions	HALF-TERM	HALF-TERM
	justify the purpose behind data types and data structures	solve a problem using arithmetic, comparison and logical operators	justify the breaking down of the problem	justify the removal of the information, giving reasons for your answers	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	assessment - Create an efficient workable algorithm and a python program with a sequence; selection and iteration with a trace table and evaluation		solve a problem involving an array in python	solve a problem involving a tuple and list in python	solve a problem involving a dictionary 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	assessment – solve problems related to arrays, lists, tuples, and creating, opening, reading, writing, and closing files.		
Retrieval / Assessment / DC	**BASELINE TEST**			**MCQs**	**DIRT**		**STAR – MOCK TEST**	**DIRT**		**DC1**					**MCQS**	**DIRT**		

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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	HALF-TERM	19-Feb	26-Feb	04-Mar	011-Mar	18-Mar	25-Mar	HALF-TERM	HALF-TERM	15-Apr
Specification	Computer Systems (1) Hardware							Computer Systems (1): Networks and Cyber Security							Computer Systems (1): Ethics
Topic	System Architecture			Memory				Threats To System Security							"Do Androids' Dream of Electric Sheep?"
	CPU	CPU Performance	Embedded Systems	Primary	Secondary		Units	Network types and topologies	Protocols and Layers	Network Threats & Malware	Social Engineering	Securing A Vulnerable Network			The Human Brain and Different Types of Learning
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.			describe how the brain processes information and learns
	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			compare the similarities and differences between the cpu and the brain
	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 human learning to a machine
Retrieval / Assessment / DC				**STAR – Exam Questions**	**DIRT**		**DC2**				**Test: Exam Questions**	DIRT			

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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	HALF-TERM	3-Jun	10-Jun	17-Jun	ROLLOVER	24-Jun	1-Jul	8-Jul	15-Jul
Specification	Computer Systems (1): Ethical, legal, cultural and environmental impacts of digital technology			Programming (2) Python Programming – III			Computer Systems (1): Systems Software		Programming (2) Data Representation					
Topic	Rule-based Learning: Autonomous Lawnmowers/ Vacuum Cleaners	Machine Learning: ChatCPT, Amazon Go, Killer Drones and Self-Driving Cars	Ethical, Legal, Cultural and Environmental Issues	Revisiting Programming Constructs			Functions of Operating Systems	Utility Software	Binary Conversions and ASCII					
Key Objectives	outline rule-based learning	define machine learning	outline the ethical, legal, cultural and environmental issues that arise from artificial intelligence	application of python to a scenario	application of python to a scenario		state the functions of operating systems	describe the purpose of encryption software	converting binary to denary; denary to hexadecimal					
	explain and demonstrate rule-based learning using examples	explain how machine learning is different to rule-based learning	explain the ethical, legal, cultural and environmental arguments for and against artificial intelligence	application of python to a scenario	application of python to a scenario		explain the features of each function of an operating system	explain defragmentation and data compression	explain characters and ASCII					
	assess the benefits and limitations of rule-based learning using real-life examples	assess the benefits and limitations of machine learning using real-life examples	evaluate the ethical, legal, cultural and environmental issues that arise from artificial intelligence	application of python to a scenario	application of python to a scenario		apply functions of operating systems to given scenarios	assess the purpose of utility software and why it is required	explain the relationship between binary and sound					
Retrieval / Assessment / DC				EXAM QUESTIONS	**DIRT**		**STUDENT VOICE**	**STAR – MOCK EXAM**	**DC3**					