

1. Year 11 Curriculum Plan – Computer Science J277

YEAR 11

HALF TERM 1

SUBJECT Computer Science

LEARNING



TOPIC	LEARNING OBJECTIVES	KEY VOCABULARY	LEARNING SEQUENCE	LINKED LEARNING	HOME LEARNING
SLR 2.2 Programming fundamentals					2.2 The use of variables, constants, inputs, outputs and assignments 2.2 The use of the three basic programming constructs
SLR 2.2 – Lesson 1, Basic programming constructs	- Know what is meant by the following key terms: - Variables - Constants - Input - Output - Assignment - Know the 3 basic programming constructs. KEY QUESTION: What terms are associated with programming?	Slides 152-199 Variable, Constant, Operator, Assignment, Programming construct, Sequence, Selection, Count controlled iteration, Condition controlled iteration, Arithmetic operator, AND, OR, NOT, ==, !=, <, <=, >, >=, +, -, *, /, MOD, DIV, ^, Data type, Integer, Real, Boolean, Character, String,	SLR 2.2 Workbook Complete slides 2-4 Using code snippets from slide 3 and 4 of the 2.2 workbook, write a program that: Suggests 3 usernames for a new user, asks for their choice of username and rejects any username entered that is less than 4 or more than 12 characters long.		2.2 The common arithmetic and comparison operators 2.2 The common Boolean operators 2.2 The use of data types and casting 2.2 The use of basic string manipulation
SLR 2.2 – Lesson 2, Data types, operators and string manipulation	- Know the different variable data types. - Understand the need for casting. - Know the arithmetic operators. - Know the Boolean operators. - Know the comparison operators. - Understand how to use computer-related mathematic operators. - Understand basic string manipulation commands.	Casting, String manipulation, OPEN, READ, WRITE, CLOSE, Record, SQL, SELECT, FROM, WHERE, Array, Sub program, Procedure, Function, Random number generation	SLR 2.2 Workbook Complete slide 5-9 Continue working on the programming exercise from the last lesson		2.2 The use of basic file handling operations

	KEY QUESTION: Why are numbers sometimes stored as strings			
SLR 2.2 – Lesson 3, File handling	- Understand how to use basic file handling operations: - Open files - Read from files - Write to files - Close files KEY QUESTION: What are the steps to using data files with programs?		SLR 2.2 Workbook Complete slide 10-11 Using the unscrambled programs from 2.2 workbook sides 10 and 11, enter these into Python as two separate programs and check they work. The data entry will be case sensitive.	 2.2 The use of records to store data  2.2 The use of SQL to search for data
SLR 2.2 – Lesson 4, Records and SQL	- Understand the term 'record'. - Understand the SQL commands: - SELECT - FROM - WHERE (including the Boolean operators) - LIKE - Know the purpose of nested SELECTs. KEY QUESTION: How is SQL used to search for data?		SLR 2.2 Workbook Complete slides 12-13 You can use the lesson 4 SQL program as a head start with the code. The code uses a database file called lesson 4 – world.sqlite3	 2.2 The use of arrays  2.2 How to use sub-programs
SLR 2.2 – Lesson 5, Arrays and sub-problems	- Understand how an array or list can be used to store data. - Understand that arrays can be one- or two-dimensional. - Understand that programs can be structured using procedures and functions. - Understand that parameters can be passed and returned from functions. - Understand that variables can be global or local. KEY QUESTION: What does a two-dimensional array or list mean? Why are sub-programs used?		SLR 2.2 Workbook Complete slides 14-17 Write a program to output a random bingo ticket. These objectives get progressively more difficult. See how far you can get. (details in lesson PowerPoint)	 2.2 Random number generation

SLR 2.2 – Lesson 6, Random number generation	Understand how to use random number generation. KEY QUESTION: In what sort of problems might we need to generate a random number or sequence of random numbers?		SLR 2.2 Workbook Complete slide 18		
			Write the dice roll program that you pseudo-coded on slide 16 of your workbook. If you have time continue with the bingo ticket problems from the last lesson.		
SLR 2.2 – Lesson 7, Catch up lesson	Catch up and complete any outstanding work from this unit. KEY QUESTION: What terms are associated with programming?		SLR 2.2 Workbook Complete any slides not yet completed in this unit.		Revise what you have learned in this unit.
			Continue working on the bingo ticket problem or any other unfinished programs from this unit.		
8-10 Dedicated paper 2 exam revision lesson	Gain experience answering computational thinking, algorithms and programming questions for component J277/02 using our dedicated exam revision unit.		Progress with activities in the “Exam revision unit” folder		
SLR 2.2 – End-of-topic test	2.2 Test.docx 2.2 Test Answers.docx				
SLR 2.2 – Action	Chance for students to respond to feedback, improve workbooks, correct misunderstandings				
SLR 2.1 Algorithms					 2.1 Abstraction
SLR 2.1 – Lesson 1, Abstraction	- Know what is meant by the term ‘abstraction’. - Know some examples of abstraction. KEY QUESTION: What are the principles of computational thinking?	Slides 134-151 Computational Thinking, Abstraction, Decomposition, Algorithmic thinking, Problem inputs, Problem processes, Problem outputs, Structure diagram, Pseudocode, Flowchart, Trace table, Searching algorithms, Binary search, Linear	SLR 2.1 Workbook Complete slide 2		 2.1 Decomposition  2.1 Structure diagrams
			Fly the paper aeroplanes. Who made the best one and why? Complete slide 3. Can you extend your icon set to include more animals? What features have you included in your icons so		

		search, Sorting algorithm, Bubble sort, Merge sort, Insertion sort	they are recognisable as part of the same icon set?		
SLR 2.1 – Lesson 2, Abstraction	- Know what is meant by the term ‘abstraction’. - Know some examples of abstraction KEY QUESTION: What are the principles of computational thinking?		SLR 2.1 Workbook Complete slide 3 Complete slide 4.		2.1 Inputs, processes and outputs 2.1 Algorithmic thinking
SLR 2.1 – Lesson 3, Decomposition and structure diagrams	- Know what is meant by problem decomposition. - Know the advantages of decomposition when applied to programming. - Know an example of problem decomposition. - Know how to produce a structure diagram to aid in decomposing a problem. KEY QUESTION: What is the purpose of decomposition, and how can producing structure diagrams help?		SLR 2.1 Workbook Complete slides 5-8 Complete the programming challenge on slide 6. To make the challenge easier, you could input N, S, E, W separately to the latitude and longitude. To make the challenge more difficult you could use string manipulation commands to extract the N, S, E, W from the right of the string.		
SLR 2.1 – Lesson 4, Algorithmic thinking	Understand how to solve computational problems by applying algorithmic thinking. KEY QUESTION: What do we mean by “thinking algorithmically”?		SLR 2.1 Workbook Complete slide 9 Start slide 10 Write the programs on slide 10		2.1 Decomposition 2.1 Structure diagrams
SLR 2.1 – Lesson 5, Algorithmic thinking	Understand how to solve computational problems by applying algorithmic thinking. KEY QUESTION: What do we mean by “thinking algorithmically”?		SLR 2.1 Workbook Complete slide 11 Continue working on problems on either slide 10 or slide 11		2.1 Inputs, processes and outputs 2.1 Algorithmic thinking