Scheme of Learning: GCSE Computing

Topic Sequence:

1	2	3	4	5	6
Computational Thinking	**Data**	**Computers**	**Networks**	**Issues and Impacts**	**Programming**

Topic Overview:

The main focus of the first three lessons of this unit is searching and sorting algorithms, though other topics are covered, such as computational thinking, flow charts, and tracing algorithms. Lessons 4 to 10 of the unit is on searching and sorting algorithms, though other topics are covered such as computational thinking, flowcharts and tracing algorithms. Learners will have opportunities to analyse, interpret, modify, and implement a range of algorithms.

Links:
GCSE Computing Topic 1

Lesson Sequence:

Lesson 1 Computational Thinking: Learners are introduced to three computational thinking techniques: decomposition, abstraction, and algorithmic thinking.
Lesson 2 Representing algorithms: The focus of this lesson is developing flow charts to illustrate algorithms.
Lesson 3 Tracing algorithms: The focus of this lesson is mainly on using a trace table to understand how the algorithm works. Learners will use trace tables for in the coding, searching, and sorting algorithms. They will also revisit flowcharts from the previous lesson.
Lesson 4 Linear search: Learners are introduced to one of the two searching algorithms they need to know about: linear search. They will go over the steps of carrying out a linear search and perform a linear search in real life and with a sample of data.
Lesson 5 Binary search: Learners are introduced to binary search, the second and final searching algorithm they need to know about. They will go over the steps of carrying out a binary search and perform a binary search with playing cards and with a sample of data.
Lesson 6 Comparing searching algorithms: Learners will compare the features of linear search and binary search and the suitability of each algorithm in different contexts. This lessons acts as a revision lesson for the two sorting algorithms from Lessons 4 & 5.
Lesson 7 Bubble sort: This lesson introduces learners to the first sorting algorithm in this unit: bubble sort. They will discuss why and where sorting is used in real life, become familiar with performing a bubble sort on a set of data, and investigate the efficiency of bubble sort.
Lesson 8: Insertion sort: Learners will explore another sorting algorithm: insertion sort and compare the efficiency to bubble sorts.
Lesson 9 Coding sorting algorithms: Learners will analyse and evaluate code for bubble sort and insertion sort in Python, as well as comparing different implementations of the bubble sort algorithm.
Lesson 10 Merge sort: Learners will explore the final sorting algorithm in this unit: merge sort. They will start by considering how they might go about combining two groups of sorted items into one sorted group. They will then compare the efficiency to Bubble and Insertion sort.

This unit

National curriculum links
Develop their capability, creativity, and knowledge in computer science, digital media, and information technology
Develop and apply their analytic, problem-solving, design, and computational thinking skills

Sequence of Lessons:

1	1.1 Computational Thinking
2	1.2 Representing Algorithms
3	1.3 Tracing Algorithms
4	1.4 Linear Search
5	1.5 Binary Search
6	1.6 Compare Searching
7	1.7 Bubble Sort
8	1.8 Insertion Sort
9	1.9 Coding Sorts
10	1.10 Merge Sort

Topic Resources:

Knowledge Map:	Computational Thinking 1- 3	**Any other Resources:**	

Assessment:

Knowledge:	2 Assessments (1 after lesson 3 and 1 after lesson 10)
Application of Knowledge:	Mastery Books

Supportive Reading:

Craig n Dave Videos	GCSE (1CP2) EDEXCEL: Topic 2A Binary - YouTube GCSE (1CP2) EDEXCEL: Topic 2B Data representation & compression - YouTube
BBC Biesize	Algorithms - Algorithms - Edexcel - GCSE Computer Science Revision - Edexcel - BBC Bitesize
Revision Guide	Pearson REVISE Edexcel GCSE Computer Science Revision Guide inc online edition - 2023 and 2024 Weidmann, Ann, Selby, Cynthia: 9781292374000: Books