



## GCSE Computer Science Key Stage 4

<b>GCSE Computer Science (OCR J277)</b>  <b>Intent Overview</b>	<b>Yr10 Content</b>	<b>Yr10 Key Assessments</b>	<b>Yr 11 Content</b>	<b>Yr 11 Key Assessments</b>
<b>Autumn 1</b>	<p>Unit 1: In this unit you will learn about the <b>architecture of the CPU</b>. You will explore what the purpose of the CPU is and what all the components inside the CPU are and what they do. You will also explore what the factors are that affect the performance of the CPU.</p> <p>Unit 2: You will explore the difference between high- and low-level programming languages and learn about the translators. You will study the</p>	End of topic assessment questions	<p>Unit 1: You will continue with networks theme from Year 10. You will learn what the rules and procedures are for computers to communicate with each other over a network – protocols. You will also learn what encryption is and why it is important.</p> <p>Unit 2: You will study decomposition, abstraction and algorithmic thinking as computations thinking techniques, learn how to recognise scenarios</p>	End of topic assessment questions



	<p>sequence construct, use subroutines, identify errors in programs and explore the tools an IDE provides. You will learn how to use variables, declare, initialise and assignment of variables in programs. You will output data and obtain input from the keyboard in a program. You will explore the different data types, and then design and translate flowcharts into a program sequence.</p>		<p>where these techniques are applied and identify algorithms that are defined as written descriptions, flowcharts and code. You will analyse and create flowcharts using the flowchart symbols.</p>	
<b>Autumn 2</b>	<p>Unit 1: In this unit you will learn what <b>primary and secondary storage</b> is. You will explore how computers store data and why they store data in the way they do.</p>	<p>End of topic assessment questions</p>	<p>Unit 1: Now you have an understanding of how networks work and the benefits they bring, the next step will be to learn how to protect them. So, in this unit you will learn what the potential risks to a network are</p>	<p>End of topic assessment questions</p>



	<p>Unit 2: You will import modules into your code and generate random number numbers in your programs. You will learn how to use arithmetic expressions using the rules of operator precedence (BIDMAS). You will learn about conditions and how to define them as an expression. You will, then study selection which uses condition to control the flow of execution in programs and use Boolean and logical operators within expressions. You will modify programs to use nested selection.</p>		<p>– the different forms of attack and you will explore ways to try and prevent potential network vulnerabilities.</p> <p>Unit 2: You will study linear search and binary search to find the position of an item in a list, perform both searches and trace code for both searching algorithms with input data. You will, then study the sorting algorithms; perform bubble sort and insertion sort to order a list containing sample data, interpret and trace code for both sorting algorithms with input data. You will merge two ordered lists and learn how to use merge sort for</p>	
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			ordering a list of items.	
<b>Spring 1</b>	<p>Unit 1: In this unit, you will learn how to perform <b>calculations</b> to work out file sizes and how to convert binary values to images, sound, and characters. You will explore the different number systems available in computing such as hexadecimal, adding binary integers and binary shifts.</p> <p>Unit 2: You will study iteration in programs, modify them to incorporate while loops and use trace tables to detect and correct any errors in the use of while loops in programs. You will then study for loop and compare the use of while and for loops</p>	End of topic assessment questions	<p>In this unit, you will explore a topic called 'systems software'. You will learn what an operating system is and what its purpose is. You will explore the different elements that make up an operating system. Within this topic, you will explore what utility software is and why it is needed.</p> <p>Unit 2: You will study databases and differentiate between flat-file and relational databases. You will use SQL to retrieve data from single and multiple tables in a relational database. You will, then use SQL to insert, update and delete data into a relational database</p>	End of topic assessment questions



	<p>in programs. You will learn about validation and perform validation checks by using iteration.</p>		<p>and interrogate and update existing databases.</p>	
<b>Spring 2</b>	<p>Unit 1: In this unit you will explore the purpose of data <b>compression</b> and investigate the different types of compression and how they work.</p> <p>Unit2: You will learn about subroutines and the purpose of parameters in subroutines. You will explore the difference between functions and procedures, use trace tables to investigate functions and use them to return values in programs. You will study the relationship between parameters and global variables.</p>	<p>End of topic assessment questions</p>	<p>Unit 1: In this final topic, you will explore the <b>ethical, legal, cultural and environmental</b> impacts of digital technology. You will explore the impacts technology has on society and what laws have been introduced over time to protect people's privacy, data and equipment.</p> <p>Unit 2: You will study the logic gates including their symbols and truth tables. You will learn how logic gates are used in computation, design and combine logic gates to solve problems. You will</p>	<p>End of topic assessment questions</p>



	<p>You will then apply the structured approach to programming and iteratively test your programs using different types of test data.</p>		<p>construct truth tables for a three-input logic circuit and write Boolean expressions to describe logic circuits.</p>	
<b>Summer 1</b>	<p>Unit 1: In this unit you will learn how computers connect to each other - <b>networks</b>. You will explore the different types of networks available and the factors that affect the performance of networks. You will also learn about the different roles of computers in a client-server and peer-to-peer network.</p> <p>Unit 2: You will learn how to use string handling techniques, use for loops and in operator for string</p>	<p>End of topic assessment questions</p>	<p><b>Unit 1:</b> During this term, the time will be spent revising the topics for your Unit 1 May/June 2022 GCSE exam</p> <p><b>Unit 2:</b> During this term, the time will be spent revising the topics for your Unit 2 May/June 2022 GCSE exam.</p>	<p>Students will sit their actual GCSE Computer Science Examinations</p>



	<p>operations. You will then study lists and arrays as data structures and learn how to use list methods to append to lists and traverse list elements. You will then explore the use of 2D lists in programs.</p>			
<b>Summer 2</b>	<p>Unit 1: In this unit we will continue the network journey. You will learn about the different hardware needed to build a network and then explore the biggest network of them all – the Internet. You will learn how the Internet is constructed and build your own mini-Internet.</p> <p>Unit 2: You will investigate the purpose of working with external files. You</p>	<p>End of topic assessment questions</p> <p>End of Year assessment</p>	<p>Lessons will run as normal until you have finished <b>both</b> of your Computer Science examinations.</p> <p><b>Unit 1:</b> During this term, the time will be spent revising the topics for your Unit 1 May/June 2022 GCSE exam</p> <p><b>Unit 2:</b> During this term, the time will be spent revising the topics for your Unit 2</p>	<p>Students will sit their actual GCSE Computer Science Examinations</p>



	<p>will learn how to read data from external text files, write and append to text files. You will then learn how to work with CSV files and practise writing data from a 1D and 2D lists to a CSV file.</p>		<p>May/June 2022 GCSE exam.</p>	
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