



Key content

Unit 1 – Computer Systems 50% Exam –

- Systems Architecture
- Networks
- Memory
- Software

Unit 2 – Computational Thinking, Algorithms and Programming 50% Exam

- Algorithms - Flowcharts
- Psuedocode
- Programming
- Design, Testing and IDES
- Data Representation

Key assessment points

There will be an end of Topic assessment. There are 10 Assessments plotted over the 2 years.

There will also be mini assessments throughout Year 1 + Year 2. The types of assessment that will take place are exam style questions and MCQ for end of unit assessments.

Year / Week	Topic	Assessment
1 – Week 6	1.0 Computer Systems	Complete Exam style questions – 6 mark and 8 mark style questions on Ethical, legal + Cultural + enviromental conserns of MCQ questions on other topic areas covered from CGP booklets and Exam builder
1 – Week 16	1.1 Systems Architecture	Complete MCQ questions based on topics learned – Summative Use Exam builder OCR and also CGP booklets. Formative Assessment for 6/8 exam style questions.
1 – Week 29	1.2 Networks	Formative Assessment – MCQ and CGP booklet questions.

		Formative – exam style questions from OCR exam builder
1 – Week 37	1.3 Memory	Summative Assessment – MCQ + CGP booklet questions Formative Assessment – Exam style questions from OCR exam builder
1 – Week 42	2.1 Algorithms	Summative Assessment – MCQ , CGP booklet questions Formative Assessment – Exam style questions OCR exam builder 6/ 8 mark questions
2 – Week 6	2.2 Programming Techniques	Summative Assessment – MCQ, CGP booklet questions Formative Assessment – Exam style questions OCR exam builder
2 – Week 10	2.3 Producing Robust programs	Summative Assessment - MCQ, CGP booklet questions. Formative Assessment Exam style questions OCR exam builder
2 – Week 14	2.4 Computation Thinking	Summative Assessment – MCQ, CGP booklet questions. Formative Assessment - Exam style questions OCR exam builder
2 – Week 21	2.5 Translator + Facilitators of languages	Summative Assessment – MCQ, CGP booklet questions. Formative Assessment - Exam style questions

2 – Week 28	2.6 Data representation	Summative Assessment – MCQ, CGP booklet questions. Formative Assessment – Exam style questions
Christian ethos		
Both the curriculum and group work should develop in students a responsible moral attitude as members of a responsible, safe and considerate online world, recognising that Christian ethics are as important online as offline. Students will understand and be able to recognise and also discuss how Christian values were applied in the history of technology and how Social Media should be used in a positive way which represents the Christian ethos.		
British values		
<p>Democracy – Will see how technology is used in countries that have democracy and compare it to how technology is used where it is autocracy</p> <p>Rule of Law – Look at all the Computer + Data laws based in the UK regarding technology</p> <p>Individual liberty – See how certain countries block access to technology or websites so they are not able to access them. Think about Ethical legal and social considerations of Computing.</p> <p>Mutual respect – Looking at how Alan Turing had a forever last affect on Computer Science and how his team were able to help in WW2.</p>		

Year 10 + 11
<p>Connected curriculum</p> <p>Unit 1 – Memory – Looking at data and its units and comparing differe sizes – Linked with simple unit calcaultions between Nibble, Byte, KB, MB, GB, TB</p> <p>Unit 1 Programming – Linked in with MFL – Concept of learning a new language (Python). Students learnng how to program a simple game using python code language. Using the same skills to learn a new language they will be picking up the language for code.</p> <p>Unit 2 – Data Represenation – Understanding the logic gates AND or Not with simple Binary again linked with Maths understanding how an electric circuit board works links in with science in year 7. Using binary numbers to convert in to Hexadecimal use of multiplying and dividing. Using ASCII, Extended ASCII and Unicode looking at across binary to hex to denary conversions using a range of process.</p>

Unit 2 Algorithms– binary search, bubble sort, linear search, merge sort and insertion sort. Looking at the mathematical calculations and steps to calculate how the computer works the methods.

**Subject: Computer Science
Annual plan Y10**



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Week	Month	Learning Intentions and/or Key Questions
1 - 1.0 Computer Systems Overview	September	<ul style="list-style-type: none"> To be able to have a basic understanding of systems architecture To be able to have a basic understanding of systems software To be able to have a basic understanding of memory and storage
2 -		<ul style="list-style-type: none"> To be able to have a basic understanding of wired and wireless networks
3 -		<ul style="list-style-type: none"> To be able to have a basic understanding of network topologies, protocols and layers
4		<ul style="list-style-type: none"> To be able to have a basic understanding of system security
5		<ul style="list-style-type: none"> To be able to have a basic understanding of Ethical, legal, cultural and environmental concerns linked to computer systems
6	October	<ul style="list-style-type: none"> To be able to define the term CPU To be able to state the purpose of the CPU
7 1.1 Systems Architecture		<ul style="list-style-type: none"> To be able to explain the principle behind the Von Neumann architecture

8		<ul style="list-style-type: none"> To be able to annotate a Von Neumann architecture diagram
9		Half term holiday
10	November	<ul style="list-style-type: none"> To be able to describe the common components of the CPU and their function
11		<ul style="list-style-type: none"> Explain how common characteristics of CPUs such as clock speed, cache size and number of cores affect their performance
12		<ul style="list-style-type: none"> To be able to define the term software To be able to classify the different types of systems software To be able to explain the purpose of the different types of systems software
13		<ul style="list-style-type: none"> To be able to describe the purpose of utility software To be able to explain the different functions of utility software
14	December	<ul style="list-style-type: none"> To explain the purpose of back-up To explain the difference between a full back-up and an incremental back-up.
15		<ul style="list-style-type: none"> To be able to describe a LAN and a WAN To be able to explain the differences between a LAN and a WAN To be able to identify the hardware required to link to a LAN and a WAN
16 – 1.1 Assessment		<ul style="list-style-type: none"> Exam style questions on topics covered in exam
17		Christmas holiday
18	January	
19 1.2 Networks		<ul style="list-style-type: none"> To be able to describe the factors that affect the performance of networks To be able to explain, with examples, the factors that affect performance of networks To be able to analyse ways to improve performance of networks
20		<ul style="list-style-type: none"> To be able to describe a client-server and a peer-to-peer network To be able to illustrate a client-server and a peer-to-peer network To be able to analyse the benefits of a client-server compared with a peer-to-peer network
21		<ul style="list-style-type: none"> To be able to identify the hardware needed to connect to a LAN To be able to explain the purpose of the different hardware needed to connect to a LAN
22		<ul style="list-style-type: none"> To be able to describe how the internet works To be able to define the terms 'DNS', 'Hosting' and 'the Cloud' To be able to analyse how communication via the internet works
23	February	<ul style="list-style-type: none"> To be able to describe the term 'virtual network'

		<ul style="list-style-type: none"> To be able to explain how a virtual network operates To be able to analyse the benefits and drawbacks of a virtual network
24		<ul style="list-style-type: none"> To be able to describe a star and a mesh topology To be able to illustrate a star and a mesh topology To be able to analyse the benefits of a mesh topology compared with a star topology
25		Half term holiday
26		<ul style="list-style-type: none"> To be able to describe the concept of network layers To be able to explain the functions of different layers in the network
27	March	<ul style="list-style-type: none"> To be able to describe how Wi-Fi works To be able to explain the frequencies and channels for Wi-Fi communications To be able to analyse the different levels of Wi-Fi encryption To be able to describe how the Ethernet works To be able to illustrate how the Ethernet connects devices on a network To be able to analyse the benefits of Ethernet connection To be able to describe IP addressing, MAC addressing and protocols To be able to explain, with examples of a school, IP addressing, MAC addressing and protocols To be able to analyse the benefits of IP addressing, MAC addressing and protocols To be able to demonstrate knowledge and understanding of wired and wireless networks To be able to demonstrate knowledge and understanding of network topologies, protocols and layers
28		
29		
30		
Assessment		
31		Easter holiday
32	April	<ul style="list-style-type: none"> To be able to define 'ROM' To be able to describe ROM To be able to draw a diagram to explain ROM in a computer system To be able to define 'RAM' To be able to describe RAM To be able to draw a diagram to explain RAM in a computer system To be able to explain the difference between RAM and ROM To be able to define 'virtual' and 'flash' memory To be able to explain the purpose of virtual memory To be able to the purpose of flash memory
33	1.3 Memory	
34		
35		
36	May	<ul style="list-style-type: none"> Understand the need for secondary storage

		<ul style="list-style-type: none"> • Understand the different types of storage device • Understand the different characteristics of different types of storage
37		<ul style="list-style-type: none"> • Be able to recommend a storage device for a situation • Estimate data capacity requirements for different file types
38		<ul style="list-style-type: none"> • To be able to explain the purpose and difference between ROM and RAM • To be able to explain the purpose and difference between virtual memory and flash memory • To be able to calculate data capacity requirements • To be able identify and justify storage devices for specific purposes
39		<ul style="list-style-type: none"> • To be able to think 'abstractly' (abstraction) • To be able to think 'procedurally' (decomposition) • To be able to think 'ahead' (algorithmic thinking) • To be able to think 'logically' (algorithmic thinking) • To be able to think 'concurrently' (algorithmic thinking)
40	June	Half term holiday
41		<ul style="list-style-type: none"> • To be able to simulate and describe a binary search • To be able to write a program to carry out a binary search • To be able to simulate and describe a linear search • To be able to write a program to carry out a linear search
42		<ul style="list-style-type: none"> • To be able to understand algorithms written using flow diagrams or pseudocode • Produce algorithms using flow diagrams or pseudocode to solve problems
43		<ul style="list-style-type: none"> • To be able to correct or complete algorithms • Produce algorithms using flow diagrams or pseudocode to solve problems
44	July	<ul style="list-style-type: none"> • To be able to describe the use of basic programming techniques • To be able to explain the use of basic programming techniques • To be able to add comments to an existing program to explain use in code
45		<ul style="list-style-type: none"> • To be able to describe the use of data types • To be able to explain the use of data types • To be able to add comments to an existing program to explain use in code
46		<ul style="list-style-type: none"> • To be able to describe the use of arithmetic and Boolean operators • To be able to explain the use of arithmetic and Boolean operators

		<ul style="list-style-type: none"> To be able to add comments to an existing program to explain use in code
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Subject: Computing
Annual plan Y11



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Week	Month	Learning Intentions and/or Key Questions
1	September	<ul style="list-style-type: none"> To be able to describe the use of sequence, selection and iteration To be able to explain the use of sequence, selection and iteration To be able to add comments to an existing program to explain use in code
2.2 Program ming techniqu es		
2		<ul style="list-style-type: none"> To be able to describe the use of strings To be able to explain the use of strings To be able to add comments to an existing program to explain use in code
3		<ul style="list-style-type: none"> To be able to describe the use of one dimensional and two dimensional arrays To be able to explain the use of one dimensional and two dimensional arrays To be able to add comments to an existing program to explain use in code
4		<ul style="list-style-type: none"> To be able to describe the use of file handling To be able to explain the use of file handling To be able to add comments to an existing program to explain use in code
5		<ul style="list-style-type: none"> To be able to describe the use of procedures and functions To be able to explain the use of procedures and functions To be able to add comments to an existing program to explain use in code
6	October	<p><u>Assessment</u> Key concept – End of unit test Task: Using responses from assessment:</p>
7 2.3 Produci ng robust program s		<ul style="list-style-type: none"> To understand the elements of defensive program design Know how comments and indentation can support maintainability Describe the role of testing, including how to identify errors and select appropriate test data
8		<ul style="list-style-type: none"> Understand the purpose of testing Identify different types of program errors
9		Half term holiday

10	November	<u>End of unit test</u> <ul style="list-style-type: none"> To be able to answer specimen exam questions on producing robust programs. Know different between iterative and terminal testing Be able to select suitable test data
11 2.4 Computational thinking		<ul style="list-style-type: none"> To be able to explain why data needs to be in binary form
12		<ul style="list-style-type: none"> To be able to draw diagrams for the AND, OR and NOT gates To be able to create a Truth Table for AND, OR and NOT gates
13		<ul style="list-style-type: none"> To be able to draw Logic Circuits and Truth Tables for 2nd Level Logic Circuits To be able to draw Logic Circuits and Truth Tables for 3rd Level Logic Circuits To be able to draw half adder and full adder Logic Circuits
14	December	<ul style="list-style-type: none"> To be able to answer MCQs on binary, logic gates and truth tables To be able to attempt the stretch and challenge tasks on logic gates and truth tables.
15 2.5 Translator + Facilitators of languages		<ul style="list-style-type: none"> To be able to describe the different generations of programming language
16		<ul style="list-style-type: none"> To be able to describe the differences between Low Level and High Level Languages To evaluate the benefits of programming in both Low and High Level languages To state which translator is needed for each and why
17		Christmas holiday
18	January	
19		<ul style="list-style-type: none"> To be able to describe the differences in operation between a Compiler and Interpreter.
20		<ul style="list-style-type: none"> To be able to describe the common tools and facilities in an Integrated Development Environment (IDE)
21		<ul style="list-style-type: none"> To be able to summarise the theory of translators and facilities of languages in an animation
22 2.6 Data representation		<ul style="list-style-type: none"> To be able to define the terms bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte To be able to understand that data needs to be converted into a binary format to be processed by a computer To be able to convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa

		<ul style="list-style-type: none"> To be able to add two 8-bit binary integers and explain overflow errors which may occur.
23	February	<ul style="list-style-type: none"> To be able to convert positive denary whole numbers (0-255) into 2-digit hexadecimal numbers and vice versa To be able to convert between binary and hexadecimal equivalents of the same number To be able to explain the use of hexadecimal numbers to represent binary numbers
24		<ul style="list-style-type: none"> To be able to explain the representation of an image as a series of pixels represented in binary To be able to explain the need for metadata to be in the file such as height, width and colour depth To be able to discuss the effect of colour depth and resolution on the size of an image file
25		Half term holiday
26		<ul style="list-style-type: none"> To be able to explain how sound can be sampled and stored in digital form To be able to explain how sampling intervals and other considerations affect the size of a sound file and quality of its playback
27	March	<ul style="list-style-type: none"> To be able to explain how instructions are coded as bit patterns To be able to explain how the computer distinguishes between instructions and data
28		<p><u>End of Unit assessment</u></p> <p>Objectives:</p> <ul style="list-style-type: none"> To be able to convert numbers To be able to calculate file sizes To be able to convert instructions into machine code
29		<ul style="list-style-type: none"> Exam Practice
30		<ul style="list-style-type: none"> Exam practice
31	Easter holiday	
32	April	
33		Exam practice
34		Exam practice

35		Exam Practice
36	May	GCSE EXAM week
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40	June	Half term holiday
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44	July	
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Subject: Computing (Year 10)
Unit: System Architecture
Medium-term plan (1)

Week	Learning Intentions/Key Questions	Learning goals for students/ content to cover	Suggested activities and differentiation	Resources needed
1	<p><u>The purpose of the CPU</u></p> <p>Objectives:</p> <ul style="list-style-type: none"> To be able to define the term CPU To be able to state the purpose of the CPU <p>Questions</p> <ul style="list-style-type: none"> What is the purpose of the CPU? What are two major components of the CPU, and what is the purpose of each? What is a register? Name four special registers in the CPU 	<ul style="list-style-type: none"> Understand the purpose of a CPU Explain the 2 main functions of a CPU Name 4 registers within a CPU 	<p>Task:</p> <ul style="list-style-type: none"> MOOC Function of CPU worksheet Computing Hardware Worksheet 1, CPU Mix and Match Internet research task – CPU diagram – locate, source, extract, annotate, explain 	<ul style="list-style-type: none"> PowerPoint Guide Computing Hardware L1: The CPU Worksheet 1
2	<p><u>Von Neumann architecture</u></p> <p>Objective:</p> <ul style="list-style-type: none"> To be able to explain the principle behind the Von Neumann architecture To be able to annotate a Von Neumann architecture diagram 	<p>To be able to list the steps and instructions of how the CPU works</p> <p>To be able to understand how the Von nuemann architecture looks</p> <p>To understand the role of a cpu in a compuer system</p>	<p>Task:</p> <p>Little Man Computer – simulation (learning mat explanation)</p> <ul style="list-style-type: none"> Internet research task – Von Neumann architecture - locate, source, extract, annotate, explain <p>Worksheet 2 differentiated at L M H</p>	<p>L2 ppt and Worksheet 2 – Diagram template of Von neumann.</p>

	<ol style="list-style-type: none"> 1. What is the main purpose of the CPU? 2. How does the CPU operate? 3. Name three common factors which affect how fast a CPU can perform? 4. What is an embedded system? 5. Name three examples of an embedded system? 			
3	<ul style="list-style-type: none"> • Describe the difference between RAM and ROM • Describe the purpose of RAM and ROM in a computer system • Explain the need for virtual memory 	<ul style="list-style-type: none"> • Description of RAM and ROM • Difference between RAM and ROM • Understand the need for virtual memory and how it works 	Students to complete task on difference of RAM and ROM – Worksheet made Easy middle and difficult based on the level of information available on the sheet	L3 ppt Worksheet 3
4	<ul style="list-style-type: none"> • Discuss the need for secondary storage including optical, magnetic and solid state storage • Evaluate suitable storage devices and storage media for a given application using the following characteristics: 	<ul style="list-style-type: none"> • Three different types of storage device have been discussed • Each has its own advantages for a particular application • Technology is constantly moving forward, resulting in higher capacities, speeds and durability • Prices are continually falling 	<p>Students will have a table of information and headings which need to be filled in. L M H – The lower end will have a table with more information and higher will have less information.</p> <p>Higher ability students will be expected to do more independent research</p>	L4 ppt Worksheet 4

5	Objectives: <ul style="list-style-type: none"> • To be able to define the term software • To be able to classify the different types of systems software • To be able to explain the purpose of the different types of systems software 	<ul style="list-style-type: none"> • Systems software • Operating systems • Utility systems • Application software 	<p>Students will look at two different types of software available – System Software and systems utilities</p> <p>Students will look at application software and how they are used in a computer.</p> <p>L M H worksheets available for students. Emphasis on Higher to do more independent research to find information that is needed.</p>	L5 ppt Worksheet 5
6	Objectives: <ul style="list-style-type: none"> • To be able to describe the function of the operating system • To be able to identify the different functions of an operating system 	Description of operating system Functions of O/S	<p>To understand how the following work in a computer</p> <ul style="list-style-type: none"> • user interface • memory management/multitasking • peripheral management and drivers • user management • file management 	L6 ppt Worksheet 6
7	Assessment week	Summative Assessment	MCQ and Exam style questions	Exam questions from the CGP booklet and exam paper questions

Medium-term plan (1)

Week	Learning Intentions/Key Questions	Learning goals for students/ content to cover	Suggested activities and differentiation	Resources needed
1	<ul style="list-style-type: none"> To be able to describe the use of basic programming techniques To be able to explain the use of basic programming techniques To be able to add comments to an existing program to explain use in code 	<p>Identify and use variables and constants</p> <p>Explain variables as labels for memory locations</p>	<p>Students to apply knowledge of variables, inputs and outputs in the real world.</p> <p>Think of the things you use or know about</p> <p>What are their inputs and what are their outputs?</p> <p>What is the processing that goes on to change inputs into outputs?</p> <p>Graduated Learning</p> <p>Tasks (Complexity of Variable assignments)</p> <p>Peer Support</p> <p>Lead Learners (Those that complete tasks accurately can support weaker learners)</p> <p>Choice of activity</p> <p>Create a program that allows pupils to apply knowledge of variables, input, output and casting:</p> <p>.</p>	<p>L1 ppt</p> <p>Worksheet 1</p>
2	<p>Identify and use variables and operators</p>		<p>Creating basic notes:</p> <ul style="list-style-type: none"> Students develop their earlier starter 	<p>L2 ppt</p> <p>Worksheet 2</p>

	<p>Find the best name and operator for the solution, cast to data types when needed</p> <p>Use descriptive naming that identifies the purpose and the type of data from the variable identifier</p>		<p>to create a basic guide to the variable data types</p> <ul style="list-style-type: none"> Students develop 3 challenge questions that can be used to check understanding of each of the strands of this lesson: data types, variables-constants-descriptive naming, operators Students create a Key Word Dictionary for the key words mentioned <p>Developing understanding:</p> <ul style="list-style-type: none"> Concatenation and substring exercise <p>Graduated Learning</p> <p>Tasks (Complexity of Variable assignments)</p> <p>Peer Support</p> <p>Lead Learners (Those that complete tasks accurately can support weaker learners)</p> <p>Choice of activity</p>	<ul style="list-style-type: none"> Discussion of BODMAS https://www.youtube.com/watch?v=VfBr32W-hRA https://www.youtube.com/watch?v=0F33v-3cUdY
3	<p>Objectives:</p> <p>Be able to break a complex task into a sequence of simple steps</p>		<ul style="list-style-type: none"> to a program provided to explain the key concept 	<p>L3 ppt Worksheet 3</p>

	<p>which would each require one line of pseudocode and/or one block in a flowchart</p> <p>Understand that the order of steps in algorithms matters</p>		<p>elements of the program</p> <p>Easy middle and difficult based on the level of information available on the sheet</p>	
4	<p>Objectives:</p> <ul style="list-style-type: none"> To be able to describe the use of sequence, selection and iteration To be able to explain the use of sequence, selection and iteration To be able to add comments to an existing program to explain use in code 	<ul style="list-style-type: none"> The use of the three basic programming constructs used to control the flow of a program: <ul style="list-style-type: none"> Sequence Selection Iteration (count and condition controlled loops) 	<ul style="list-style-type: none"> Written - Explaining key concept(s) of lesson using the example Computer – Add comments to a program provided to explain the key concept elements of the program 	L4 ppt Worksheet 4
5	<p>Objectives:</p> <ul style="list-style-type: none"> To be able to describe the use of strings To be able to explain the use of strings To be able to add comments to an existing program to 	<ul style="list-style-type: none"> The use of basic string manipulation To be able to explain the use of one dimensional and two dimensional arrays To be able to add 	<ul style="list-style-type: none"> Written - Explaining key concept(s) of lesson using the example Computer – Add comments to a program provided to explain the key concept elements of the program 	L5 ppt Worksheet 5

	explain use in code	comments to an existing program to explain use in code		
6	Objectives: <ul style="list-style-type: none"> • To be able to describe the use of file handling • To be able to explain the use of file handling • To be able to add comments to an existing program to explain use in code 	Description of operating system Functions of O/S	Following work in a computer <ul style="list-style-type: none"> • user interface • memory management/multitasking • peripheral management and drivers • user management • file management 	L6 ppt Worksheet 6
7	Assessment week	Summative Assessment	MCQ and Exam style questions	Exam questions from the CGP booklet and exam paper questions