KS3 Curriculum Overview: Computing

Rationale

At Key Stage 3, our Computing curriculum is designed to provide students with a broad and engaging introduction to digital literacy, programming, and computer science principles. Across Years 7 and 8, students develop a strong foundation in both theoretical knowledge and practical skills, preparing them for further study and real-world applications.

Year 7 Overview

In Year 7, students begin by exploring how to use computers safely, responsibly, and effectively. This includes an introduction to cybersecurity and how computers communicate, culminating in the creation of an informative leaflet tailored to a specific audience. Students then move on to working with spreadsheets, gaining hands-on experience with data management and software systems. This unit supports cross-curricular links with mathematics and science, reinforcing analytical and logical thinking. Later in the year, students revisit Scratch—building on prior knowledge from Key Stage 2 or learning it for the first time. They develop a game within a visual programming environment, enhancing their understanding of coding logic and structure. In the summer term, students explore the internal components of a computer and how binary language is used to process and communicate data.

Year 8 Overview

Year 8 builds on the foundations laid in Year 7, beginning with computational thinking and algorithm design. Students apply these concepts using Flowol to simulate real-world systems, before progressing to text-based programming with Python. This transition supports the development of more advanced programming skills, including the use of procedures, functions, and lists—key components of the GCSE Computer Science curriculum. On digital graphics unit, where students learn about bitmap and vector image formats, file types, and image representation. They also develop practical skills in design, photo editing, and image manipulation using industry-standard software. Final projects are compiled into an assessment portfolio to showcase their learning.

Term / Length of Unit	Outline	Assessment	Home Learning	Resources	Knowledge/Skills End Points	Vocabulary/ reading strategy
Y7 Autumn 1 using computers safely, responsibly and effectively	Students have come from primary learning about e-safety. This term we introduce students in ways to use technology safely and using computers safely, responsibly and effectively including protecting themselves online and knowing how to report it. Alongside this students learn how to use email and the features. We conclude by introducing students how to effectively search on the internet and teach students desktop publisher skills to create a leaflet on malware.	Progress: Students know about social networking and e-safety/cyber security students know how to report it. Using computers assessment	Online Educake Revision for final assessment	using computers safely, responsibly, and effectively. L1 File management L2 social networking L3 keeping your data safe. L4 using email. L5 searching the web. L6 Malware L7 Assessment	<u>Knowledge</u> Key vocabulary e-safety Digital footprint effective searching using Boolean logic <u>Skills</u> File management/ organisation skills Effective search techniques Literacy skills page Basic good design skills and collecting suitable text and images Email tools	Malware Spyware Adware Phishing Trojan horse Pre-teaching of key words and what the threats are.
Y7 Spring 2 Understanding computers	This is a theoretical unit covering the basic principles of computer architecture and use of binary. Pupils will revise some of the theory on input and output covered in previous learning and continue to look at the Input-Process-Output	Progress: Students know about range of computer components and the functionality Students will know how	Up and Coming Technologies Revision for final assessment	Lesson 1 Elements of a computer system Lesson 2 The CPU Lesson 3 Understanding binary	<u>Knowledge</u> Key components of a computer How computers communicate in 1's and 0's How to work out binary into denary <u>Skills</u> Numeracy skills	Binary Storage devices Hardware Software

	sequence and the Fetch-Decode-Execute cycle through practical activities. Pupils will then look at some simple binary to decimal conversion and vice versa, and learn how text characters are represented using the ASCII code. This will be followed by some simple binary addition. Pupils will look more in depth at how storage devices store or represent data using binary patterns. A final lesson covers the history and development of communication and technology, and some of its applications.	numbers can be represented in binary, and be able to carry out simple operations on binary numbers for example, binary addition, and conversion between binary and decimal Unit assessment		Lesson 4 Binary addition Lesson 4a Logic Gates Lesson 5 Storage devices Lesson 6 Convergence and new technologies Unit assessment	Presentation skills Oral skills	Embedded Pre-teaching through PowerPoint resources Student activity sheets in lessons.
Y7 Spring Spreadsheet	Students have some understanding of collecting, analysing, evaluating and presenting data and information from KS2 Using spreadsheet to model different scenarios within this student would have collected and analysed data and presented in appropriate format. The skills students develop in this unit directly crosses over in different curriculum areas, science, maths, geography as well as giving them a real insight on how it is used industry.	Progress: Varity of practical skills using Harry Plotters resources Final assessment to be able to plan your own model to a scenario from lesson 7 skills and lesson 8 knowledge.	Spreadsheets and Modelling Homework Revision for final assessment	Project 1 PPT Shopping list Hogwalks house School tests Concocting spells Cast spells modelling sheet Hogswalks students stationary shops Owl letters delivery service	<u>Knowledge</u> How spreadsheets are used in career Presenting information in different ways Selecting most appropriate charts <u>Skills</u> Analysing, planning data and collecting Numeracy skills e.g. mathematical operators Writing formulas max, min, sum, average. Creating graphs	Formular Function Cell reference Chart Labelling the layout of a spreadsheet. Using the tools to carry out the tasks. Teacher modelling of how to "read" and analyse spreadsheets.

Y7 Summer Games programming in Scratch	Pupils begin this unit with an introduction to the Scratch programming environment, and by reverse- engineering some existing games. They then progress to planning and developing their own game, learning to incorporate variables, procedures (using the Broadcast function), lists and operators. They should be able to create a fully working game. Finally they will learn to test and debug their programs as they develop.	Progress: students have a task tracker that allows them to chart their progress and independently differentiate each task. Assessment: End of unit assessment on skills what they have learnt through the lessons	Using Variables Revision for final assessment	Lesson 1 Movement Lesson 2 Lives and scoring Lesson 3 Adding a new level Lesson 4 Randomising the behaviour of sprites Lesson 5 Shooting and jumping Lesson 6 Adding sounds Lesson 7 Testing and assessment Extension lesson Using lists	<u>Knowledge</u> Students will have knowledge from KS2 use sequence, selection, and repetition in programs; work with variables and various forms of input and output <u>Skills</u> Creating a script, making functions, understanding lists and looking at inbuilt library such as randomise	Variable Loops Operator Sprite Pre-teaching keywords Students demonstrating skills in scratch Teacher modelling of how to code Python
Y8 Autumn 1 Computational Thinking	This unit introduces students to the world of computational thinking and logic. This unit includes many novel activities to introduce key topics. For example, logical deductions and logical puzzles are used to show logical thinking, water pipes are used to introduce logic gates, network topology is used to show how mazes can be solved and phone messaging is used to demonstrate decomposition.	Progress: Be able to ask logical questions to solve problems. Understand how logic is used in different situations. Understand what an algorithm is. Know the difference between lossy and lossless compression. Understand how abstractions are	Educake: Computational thinking Revision for final assessment	Lesson 1 - Logical thinking Lesson 2 - Logic gates Lesson 3 - Algorithmic thinking 1 Lesson 4 - Algorithmic thinking 2 Lesson 5 – Abstraction Lesson 6 – Decomposition Lesson 7- Assessment	<u>Knowledge</u> Students have studied algorithms and computational thinking topics in year 7 with Scratch skills. <u>Skills</u> Be able to ask logical questions to solve problems. Know the common Boolean operators: AND, OR, NOT Know different logic gates including: AND gates, OR gates, NOT gates Understand what an algorithm is and Create a sequence of instructions to achieve a goal	Boolean operators (AND OR NOT) logic gates (AND gate, OR gate, NOT gate) algorithm abstraction decomposition

		used in everyday life. Understand how decomposition can be used to break down problems into more manageable components. Assessment: multi-choice test of 40 questions is also given.				
Y8 Autumn 2 Flowol	Students begin year 8 with knowledge on how computers work and how they could be used to model behaviour. Within the first term we build upon this by introducing how to write algorithms for real life scenarios and use flowol to decompose a problem	Progress: students begin by identify steps to make a cup of tea to then programming traffic lights, light house etc.. sequences Assessment is Flowol and students demonstrating and following algorithms	Computer control HL Revision for final assessment	Lesson 1 PPT Video clip on BBC computational thinking Flowchart symbols Making a cup of tea Lesson 2 PPT Light house mimic Software Flowol V3 Extension mimic	<u>Knowledge</u> Understanding that computers are all around us inside and outside a house and all use programs based on algorithms. Ambitious vocabulary <u>Skills</u> Planning, writing and following algorithms Problem solving skills Using a new software Explaining/annotating flowcharts	Start/Stop Input/Output Decision process
Year 8 Spring Introduction to python	We make the link from flowol to python in which we learn how to program algorithms in python. The focus is on getting pupils to understand the process of developing programs, the importance of writing correct syntax, being able to formulate algorithms for simple programs and debugging their programs. Pupils will look at If statements and While loops whilst covering concepts such as	Progress: Students start from simple "Hello World" to writing variables, concatenation, selection and loops. Designing functions and procedures. Underling and making list Assessment: End of unit Assessment	Python Home learning Revision for final assessment	**Lesson 1** Basic syntax errors and print **Lesson 2** Variables and concatenation **Lesson 3** A simple calculator **Lesson 4** Selection and Loops **Lesson 5** Use selection (if-elif-else statements)	<u>Knowledge</u> This builds on how to structure there program from flowcharts to text programming. <u>Skills</u> Writing and understanding syntax Problem solving Analytical skills Python software Testing Using iterative testing Logical errors Mathematical skills Maths operators	Strings Variables While loops Selection Syntax errors Embedded In lessons through pre teaching, student have activities to do in python which shows those skills applied.

	validation and searching. The pupils' final programs are put into a learning portfolio with evidence of correct running, for assessment purposes. Pupils then use For loops and compare their use with While loops, before moving on to arrays (lists), which are introduced as a new data structure and are used in conjunction with For loops.			**Lesson 6** Lists using Planets		
Year 8 Spring Python Next steps	Procedures and functions with parameters are covered to help pupils understand the concept and benefits of modular programming. This unit is designed to take pupils right up to a point where a GCSE in Computing can pick up and should provide ample experience of programming in order to confirm any decision to pursue Computing as a GCSE option.			**Lesson 7** Perform operations on lists **Lesson 8** Use iteration (while statements) **Lesson 9** Selection using Functions **Lesson 10** Assessment		Strings Variables While loops Selection Syntax errors Embedded In lessons by pre teaching. student activities on python which shows those skills applied.
Year 8 Summer Digital graphics	Digital Graphics Is an introduction to graphics and graphic file types. The unit explores how bitmap and vector images are represented and stored by the computer. There is also opportunity for pupils to practise skills in design, photo-editing and image manipulation using a suitable graphics package. The pupils' final posters are put into an assessment portfolio.	Progress: Students learn vector graphics Assessment: Make a poster meeting the requirements on the skills learnt	Home learning Bitmap & Vector Conveying meaning Effects & Enhancement Assessment: Make a poster meeting the requirements.	**Lesson 1** introduction to vector graphics **Lesson 2** Bitmap graphics **Lesson 3** conveying meaning **Lesson 4** Effects and enhancements **Lesson 5** adding text **Lesson 6 and 7** Skills practice **Lesson 8** create a film Poster **Lesson 9** Assessment	<u>Knowledge</u> Pupils have previously covered binary representation of text, and binary to decimal conversion in other units which would help to reinforce their understanding of how image data can be represented. <u>Skills</u> *Practice with different image types and graphics manipulation, such as:* Vector, bitmap, properties, scalable, analogous, complementary and monochromatic colour schemes, pixel, bit, byte, dpi, gradient fill effects, saturation, brightness, contrast, resolution, layer, white space.	Vector Bitmap Resolution Layers Embedded in lessons through pre teaching within resources. Students use the image types and skills in their graphic poster.