



<i>Subject: Computing</i>	<i>Year: 9</i>	<i>Author: N. Ogu</i>
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Key Knowledge <i>Students will know</i>	Key Skills <i>Students will be able to</i>
<p style="text-align: center;"><u>Key Threshold Concepts:</u></p> <p>Year 9 Computing prepares students for GCSE by deepening skills in creative digital production, problem-solving, and programming.</p> <ul style="list-style-type: none"> • How 3D models and animations are constructed in Blender using transformation, materials, timelines, keyframes. • How computers represent and manipulate data through binary and how linear and binary search algorithms operate. • How Algorithms are designed using flowcharts and logical reasoning. • How Python programs are structured using input/output, variables, selection, iteration and basic subroutines. 	<p style="text-align: center;"><u>Subject Skills:</u></p> <p><i>By the end of Year 9, students should be able to</i></p> <ul style="list-style-type: none"> • Design, build and animate 3D objects in Blender using keyframes and timeline control. • Apply binary maths and trace algorithms to compare linear and binary search. • Create and analyse flowcharts to represent decision-making and iterative processes. • Write structured Python programs using variables, loops, conditions and simple functions.

<p style="text-align: center;"><u>Subject Specific Knowledge and Sequencing:</u></p> <p>1 lesson each two-week cycle</p> <ul style="list-style-type: none"> • Term 1 – 3D Animation (Blender): Students develop spatial reasoning, creativity and technical accuracy through modelling, transforming objects, applying materials, and animating using keyframes. This builds confidence in working with complex interfaces and multi-step workflows. • Term 2 – Binary & Algorithms: Learning shifts to core computer science concepts: binary conversions, data representation, and search algorithms. Students practise algorithm tracing and flowchart logic, preparing them for GCSE computational thinking. • Term 3 – Python Programming: Students transition into text-based programming. They build programs using input/output, variables, sequencing, 	<p style="text-align: center;"><u>Prerequisites and Spiral Teaching:</u></p> <ul style="list-style-type: none"> • Students begin Year 9 with secure KS3 foundations in digital literacy, networks, data handling, and block-based or hybrid programming (e.g., EduBlocks). • Retrieval practice reinforces core concepts such as logic, sequencing, variables and algorithms. • Misconceptions are identified early through quick checks, modelling and portfolio review. • Knowledge spirals across the year for example, algorithm tracing introduced in Term 2 directly strengthens Python debugging skills in Term 3. • Skills developed in Blender (precision, sequencing steps, planning processes) support later algorithmic and programming work.
	<p style="text-align: center;"><u>Cross-Curricular Knowledge Links</u></p> <ul style="list-style-type: none"> • Art: Animation principles, visual composition, and creative design.



<p>selection and iteration. Small projects consolidate understanding and introduce GCSE-level problem-solving structures.</p>	<ul style="list-style-type: none"> Maths: Binary, logic, coordinates, transformations and problem-solving. English: Sequencing ideas, writing clear instructions, and logical structuring. DT: Systems thinking, iteration, refinement and evaluation.
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Reading Lists / Sources / Reading around the subject recommendations:

<ul style="list-style-type: none"> Blender.org – Beginner & Animation Guides NCCE KS3 & GCSE Bridging Python Resources Python Tutor (Visual Code Tracing) BBC Bitesize KS3 Computing – Algorithms, Binary, Python 	<ul style="list-style-type: none"> CS Unplugged – Algorithm & Logic Activities Hello World Magazine (Raspberry Pi Foundation) W3Schools Python Basics (Selected KS3 Pages)
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