

KS3 Curriculum

Computer Science

CURRICULUM INTENT?

What does Computer Science do to help young people achieve at KS3? Why have you made these curriculum choices?

Our KS3 Curriculum is designed to be rich in knowledge across a wide range of topics, ensuring that we not only fulfil the National Curriculum but also look to extend students' knowledge and develop skills that will equip them for further study at KS4 and importantly for when they leave school and move on to the wider world of work.

We want our students to understand and play an active role in the digital world that surrounds them, not to be passive consumers of technology. A sound understanding of computing concepts within our curriculum will help them see how to get the best from the systems they use, and how to solve problems when things go wrong.

The Computer Science area of the curriculum focuses on allowing students to:

- Learn how to stay safe online and apply the principles of good computer etiquette and file management to other curriculum areas.
- Use block and text-based programming software to engage the students in computational thinking and problem solving.
- Show how modelling using spreadsheet software can more effectively solve labour intensive mathematical and organisational problems.
- Think creatively, innovatively, analytically, logically and critically.
- Use animation software to engage with the student's artistic flair and show how this can be incorporated into a final product.
- Understand the components that make up digital systems, and how they communicate with one another and with other systems.
- Understand the impacts of digital technology to the individual and to society in general.
- Apply mathematical skills relevant to Computer Science and wherever possible link the exercises to real world scenarios.

The Creative IT area of the curriculum focuses on allowing students to:

- Be equipped with the wide range of knowledge and skills needed to work in the creative digital media sector.
- Learn industry standard pre-production techniques and workflow such as visualisation diagrams, mind maps and task planners.
- Become familiar with some of the most popular software used in the Creative IT fields.
- Create their own comic strip from planning phase through to using software.
- Create a multimedia product using Microsoft PowerPoint.

- Learn how to manipulate digital graphics.
- Learn how to gather and process information into a suitable multimedia product.

With the curriculum covering both areas it allows students to make a more informed decision when choosing their options at Key Stage 4, whether they follow the GCSE Computing route or the Creative IT option.

TERM BY TERM BREAKDOWN – Knowledge acquired, and skills developed:

	Year 7 Course Outline	Year 8 Course Outline	Year 9 Course Outline	Opportunities beyond the classroom
Autumn Term	<p><i>Knowledge:</i> Digital Citizenship</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Using passwords effectively. • File management. • Health and safety using IT equipment. • How to use email systems with an emphasis on email etiquette. • The dangers of Cyberbullying and online grooming and how to minimise the risks. 	<p><i>Knowledge:</i> Understanding Computers</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Understand what is meant by a 'computer system'. • Learn the main components of a computer. • Name and recognise the main input and output devices and what senses they engage. • The CPU – Learn how the central processing unit works. • Understanding how binary code works and why computers use it. • Binary addition – adding numbers in binary. • Storage devices • Convergence and new technologies 	<p><i>Knowledge:</i> Computing Fundamentals</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Learn how the different elements work cohesively and the different uses for each type of storage along with the components of the CPU and the advantages of the Von Neumann Architecture, building and refining on the core knowledge from the Understanding Computers work in Year 8. • List and explain the advantages and disadvantages of different network topologies and recognise these from diagrams. • Understand the purposes of WANs, with particular focus on the internet. • Compare and contrast Client server and Peer to Peer networks. • Understand forms of attack and threats posed to a network. 	<p>Students can sign up for codecademy: https://www.codecademy.com/learn/learn-python-3</p> <p>Students are encouraged to stay up to date in the subject by reading technology journals, magazines and websites.</p>

Spring Term	<p>Knowledge: *Special remote learning journey: Computer Crime and Cyber Security</p> <p>Key Skills:</p> <ul style="list-style-type: none"> • How to spot email scams and avoid being a victim. • Understand and give examples of what is meant by Phishing. • Understand what constitutes Computer Misuse. • List methods of how to protect personal data. • Learn about Copyright law and Plagiarism. • Be able to spot Health problems caused by bad practice. <p><i>*This learning journey takes the place of 'Programming with Small Basic' this year due to the inconsistencies with student home I.T facilities.</i></p> <p><i>*Students will still have a chance to experience and learn programming through Small Basic later in the year, but on a reduced level.</i></p>	<p>Knowledge: Programming with Python</p> <p>Key Skills:</p> <ul style="list-style-type: none"> • Understanding the uses of Python as a high level programming language. • Understand how Python handles String and Variables. • Using numbers and arithmetic within programming code. • Understanding how to use and apply Selection. • Be able to write Algorithms. • Using and interpreting While Loops within code. • Understand methods Searching and being able to pick out the most effective method. • Be able to carry out testing and debugging on programs effectively. 	<p>Knowledge: Comic Strip Creation</p> <p>Key Skills:</p> <ul style="list-style-type: none"> • Understand the use of genre and be able to give examples. • Appreciate target audience when designing a comic strip. • Explore different comic strip creation software and the tools within. • Interpret client requirements. • Construct a script and storyline. • Identify assets required for successful production. • Learn how legislation might affect the assets used. • Be able to effectively review a comic strip and identify areas of development. <p>Knowledge: Logical Thinking</p> <p>Key Skills:</p> <ul style="list-style-type: none"> • Problem solve with computational thinking. • Develop algorithms using flow diagrams. • Recognising logic diagrams and creating truth tables • Learn how to complete binary arithmetic and hexadecimal calculations and conversions. 	<p>Free comic strip creation software: https://www.storyboardthat.com and http://www.pixton.com</p> <p>Software to create characters that can then be exported to comic creation software or used on their own: https://charactercreator.org/ and image editing software http://photopea.org</p>
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Summer Term	<p><i>Knowledge:</i> Spreadsheets</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Understand basic spreadsheet - Cell referencing, Basic formulas and functions. • Appreciate how computer modelling helps to make and influence predictions. • Create financial models for a given scenario using appropriate calculations. • Use 'What IF' Scenarios to engage in decision making. • Applying conditional formatting and validation. • Creating Macros for increased functionality. • Producing Charts to display information in a more visual format. 	<p><i>Knowledge:</i> Animation</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Learn the main features of the Adobe Flash GUI. • Produce a Frame-by-Frame animation. • Use Motion Tweening. • Create Text, Buttons and apply ActionScript to them for enhanced interaction. • Learn how to plan an animation. • Adding sound effects to an animation. • Publishing an animation in and appropriate file format. 	<p><i>Knowledge:</i> Digital Graphics</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Learn the key differences between Bitmap and Vector graphics. • Understanding the importance of client requirements when designing digital graphics. • Learn how to interpret a client brief. • Learn how copyright protects original works. • Learn how to create a visualisation diagram. • Be able to explore and select different tools to create digital graphics. • Review digital graphics EFFECTIVELY. <p><i>Knowledge:</i> Advanced Python Programming</p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • Revisiting skills learnt in year 8 such as variables and constructs such as iteration (loops) and selection (if statements). • Using lists. • Reading from a file. • Writing to a file. • Creating programs to solve problems. 	<p>Code with python online with no need to install it locally: https://repl.it/languages/python3</p> <p>Attempt gradually more difficult tasks to increase coding skills. https://snakify.org/teacher/</p> <p>A coding club is planned to start when the year 11 exam revision sessions are complete.</p>
	Key Independent Learning Resources			GREAT READS
			Coding for Beginners: Using Python	

The PowerPoint presentations for all lessons are available to students by using their Schoology accounts.

Computer Science for Fun:

BBC Bitesize

<https://www.bbc.com/bitesize/subjects/zvc9q6f>

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**My Revision Notes: OCR Cambridge Nationals in Creative iMedia L 1 / 2:
Pre-production skills and Creating digital graphics**

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