

Department:	ICT, Business Studies & Computer Science	Head of Department:	Mr Weir
5 Year Overview-Curricular Goals and Aims			

“It is only when they go wrong that machines remind you how powerful they are.” - Clive James

Computer Science is the study of processes that interact with data and that can be represented as data in the form of programs. It enables the use of algorithms to manipulate, store and communicate digital information. Information technology is the use of computers to store, retrieve, transmit and manipulate data or information.

This department strives to develop a passion in students for technology and information systems. Students have many opportunities to develop digital literacy whilst having the opportunity to learn concepts and principles from Computer Science and Information Technology. It provides opportunities to focus on the fundamental principles and concepts of computer science, including abstraction, logic, algorithms, programming and data representation. Students are encouraged to become independent learners, and work in teams to be able to analyse problems in computational terms, and have repeated practical experience of writing computer programs to solve such problems. Students are also encouraged to be articulate using appropriate subject vocabulary in a range of contexts. Technology advances constantly and people are always working on new and inventive ways to use it.

By studying Computer Science, our students will be able to evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. They will also become responsible, competent, confident and creative users of information and communication technology. We aim to foster curiosity and thinking skills in all our learners, preparing them to learn how to look at a problem and working out a way a computer might be able to help you solve it. We aim to prepare our students to become logical thinkers and problem solvers. Our overriding aim is to prepare students with the digital literacy skills in the event of them discontinuing their study in this field, that they are still supported in all areas of their education and work.

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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 7	Digital Literacy: Impact of Technology	Data and Data Representation: Spreadsheets	Networks and Communication: Introduction to Networks	Programming: Kodu	Programming: Minecraft & Scratch	Digital Literacy: Using Media
	Students will: Familiarise themselves with the school network and how to use it appropriately. Learn how to use presentation software while learning how to be respectful online, the digital footprint, and cyberbullying.	Students will: Learn the difference between data and information and confidently model data within a spreadsheet. Use basic formulas and functions to help model a solution to a problem and help support them in many areas of life.	Students will: Define a network and understand wired & wireless data transmission and the benefits of networking. Develop an understanding of the terms 'internet' and 'World Wide Web' including some online services.	Students will: Learn the basic concepts of programming by creating simple interactive games. Study basic uses of sequence, selection and iteration, and add image-based coding to objects on the screen.	Students will: Build upon the programming concepts to use block-based programming to create events and allow character control. Learn the use of variables in programs and how to create subroutines, use decomposition and how to solve problems.	Students will: Learn formatting skills to create a blog post about a real-world cause that they would like to gain support for. Explore concerns surrounding the use of other people's work, including licensing and legal issues.
YEAR 8	Programming: Mobile App Development	Hardware and Software: Computer Systems	Networks and Communication: Developing for the web	Digital Literacy: Vector Graphics	Data and Data Representation: Binary and Logic	Programming: Edublocks
	Students will: Work to consider the needs of the user and decompose the project into smaller, more manageable parts. Learn object oriented, event driven programming and design, create and test a mobile app to meet given success criteria.	Students will: Learn the different types of computer, their uses, and what makes a device a computer. Learn the different pieces of hardware and software and how they combine to create a system.	Students will: Explore the technologies that make up the internet and World Wide Web including HTML, and CSS Learn how search engines work and index pages, and create their own working website.	Students will: Learn the difference between vector and bitmap graphics and their uses. Learn how to make effective vector and bitmap graphics for a given 'real-world' scenario.	Students will: Learn how all data is represented on a computer and how to convert between binary and denary numbers. Learn how images & sound might be represented and know the basic logic gates and their truth tables.	Students will: Build upon their previous knowledge and start to make the steps between block and code-based programming in python. Explore the use of loops and lists to solve more complex programming problems.
YEAR 9	Networks and Communication: Cyber Security	Data and Data Representation: Data Science	Programming: Physical computing	Digital Literacy: Media – Animations	Data and Data Representation: Audio Visual	Programming: Python Programming
	Students will: Learn about the reasons behind cybercrime and the possible threats to data. Study possible practices and preventions to the threats to data and how they work to ensure the	Students will: Study the transition between data and information and how insights can be gathered to help decision making. Learn how to create data visualisations and use data to help answer important questions	Students will: Start to put programming into action using a real-world physical robot. Build on the previous programming knowledge to explore how control technology can advance and	Students will: Discover how professionals create 3D animations using the industry-standard software packages. Learn the basics of modelling, texturing, and animating;	Students will: Focus on digital media such as images and sounds, and discover the binary digits that lie beneath these types of media. Use software to manipulate images and sounds and see the	Students will: Learn how data can be represented and processed in sequences, such as lists and strings. Be able to write in fully text-based programming environments using data such

	safe storage of data and information.	and make decisions based on analysis.	have a positive impact on society.	outputs will include 3D models, short videos, and VR.	impact on storage size, and quality.	as solar system planetary data, book texts, capital cities etc.
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	DIGITAL INFORMATION TECHNOLOGY					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 10	USER INTERFACES	PROJECT PLANNING	INTERFACE DESIGN	DATA SCIENCE	MODERN TECHNOLOGY	MODERN WORKING
	<p>Students will:</p> <p>Investigate user interface design for individuals and organisations.</p> <p>Analyse existing interfaces like iPhone, Android and Playstation/XBOX for design principles and accessibility features.</p>	<p>Students will:</p> <p>Use project planning techniques to plan and design a user interface.</p> <p>Learn how to create Gantt and PERT charts, and use planning tools like mind maps, mood boards and storyboards in the development of a design proposal document.</p>	<p>Students will:</p> <p>Develop and review a user interface.</p> <p>Learn Photoshop skills and how to create high quality assets for a given scenario.</p> <p>Compile a working interface with navigation and accessibility features.</p>	<p>Students will:</p> <p>Investigate the role and impact of using data on individuals and organisations.</p> <p>Learn about big data and how large companies collect and analyse this information.</p>	<p>Students will:</p> <p>Understand how and why modern technologies are used by organisations and stakeholders to access and manipulate data.</p> <p>Learn about email, videoconferencing and networks.</p> <p>Understand the cloud and its features.</p>	<p>Students will:</p> <p>Understand how technologies are used to manage teams, to enable stakeholders to access tools and services, and to communicate effectively.</p> <p>Learn about the benefits and drawbacks of working online including the communication platforms.</p>
YEAR 11	CYBERSECURITY	ISSUES WITH IT	DATA FLOW	TOOLS IN DATA SCIENCE	PROJECT REVIEW	
	<p>Students will:</p> <p>Understand how the increased reliance of organisations on digital systems to hold data and perform vital functions presents a range of challenges and dangers.</p> <p>Learn about possible threats to data including viruses and worms and how to prevent them.</p>	<p>Students will:</p> <p>Understand the wider implications of digital systems and their use.</p> <p>Learn about policies in the workplace including security procedures and disaster recoveries.</p> <p>Learn about the legal and ethical implication of IT.</p>	<p>Students will:</p> <p>Understand how different forms of communication can be used to express understanding and demonstrate the flow of data and information.</p> <p>Be able to read and create flowcharts and data flow diagrams.</p>	<p>Students will:</p> <p>Create a dashboard using data manipulation tools.</p> <p>Learn advanced spreadsheet skills including formulas, functions, macros and how to use these to help aid decision making for a given purpose.</p>	<p>Students will:</p> <p>Draw conclusions and review data presentation methods.</p> <p>Be able to use a data dashboard to answer a set task and solve problems.</p>	

	BUSINESS STUDIES					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 10	MARKET SEGMENTATION	MARKET RESEARCH	PRODUCT DESIGN	BUSINESS FINANCE	START-UP BUSINESSES	REVIEWING A PROJECT
	<p>Students will:</p> <p>Understand how to target a market with customer segmentation and put this into practice.</p> <p>Be able to identify and describe the customer profile for their own business challenge.</p>	<p>Students will:</p> <p>Understand market research techniques and complete primary and secondary market research.</p> <p>Be able to use research to aid decisions relating to their own business idea.</p>	<p>Students will:</p> <p>Understand how to attract and retain customers and be able to develop a design proposal for a business challenge.</p> <p>Be able to design a new product and discuss and evaluate their designs.</p>	<p>Students will:</p> <p>Understand what makes a product or service financially viable and be able to review whether a business proposal is viable.</p> <p>Learn about the different types of costs relating to business and what it takes to break even and make profits.</p>	<p>Students will:</p> <p>Understand product development and factors for consideration including different functional activities when starting up a business.</p> <p>Learns how businesses operate in the real world.</p>	<p>Students will:</p> <p>Review and evaluate a business challenge and suggest potential improvements.</p> <p>Complete their own business challenge and finalise their coursework portfolio.</p>
YEAR 11	BRAND IDENTITY	BRAND IDENTITY	PLANNING A PITCH	DRAGON'S DEN	REVIEWING A PITCH	
	<p>Students will:</p> <p>Be able to develop a brand identity and promotional plan to target a customer profile.</p> <p>Learn how brands are established and grown.</p>	<p>Students will:</p> <p>Be able to develop a brand identity and promotional plan to target a customer profile.</p> <p>Learn the techniques and methods used to create a start-up brand and become established.</p>	<p>Students will:</p> <p>Be able to plan a pitch for a proposal.</p> <p>Learn all the requirements necessary for a successful pitch.</p>	<p>Students will:</p> <p>Be able to pitch a proposal to an audience.</p> <p>Present to staff and students about their idea and receive feedback.</p>	<p>Students will:</p> <p>Be able to review the strengths and weaknesses of a proposal and pitch.</p> <p>Make suggestions for improvements on their pitch and finalise their portfolio.</p>	

	COMPUTER SCIENCE					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR 10	THE INTERNET	TAKING CONTROL	DATA REPRESENTATION	IMPACT OF ICT	UNDER THE HOOD	ADVANCED PROGRAMMING
	Students will: Understand what the Internet is and how it works including potential threats to networks and how you can prevent them.	Students will: Understand the basics of programming theory and begin to put it into practice. Take part in practical programming in python while investigating the theory behind their choice. Learn how to break down algorithmic problems and find solutions.	Students will: Understand how all data is represented stored and manipulated in a digital form. Investigate how computers create and store images and sound. Learn how different characters in languages across the world are stored.	Students will: Investigate the issues surrounding the use of ICT and technology in the modern world. Learn About the laws relating to Computer Science. Examine the ethical and environmental issues involved with ICT and computers.	Students will: Understand the hardware and software required to make a computer system. Investigate the different types of computer system and all of their internal components. Learn how computers work.	Students will: Build on the basics of programming to learn more complex skills and algorithms. Learn about data structures and how programs interact with them to access information.
YEAR 11	ELECTRONICS	ALGORITHMS	INTERLEAVING AND EFFICIENCY	PROGRAMMING PROJECT	REVIEWING A PITCH	
	Students will: Investigate Boolean logic and how data is stored in all formats including compression and encryption. Learn about the different types of compression and how they affect storage. Examine encryption methods and how they can help with security issues.	Students will: Investigate how a computer searches and sorts through data, and how to program more complex algorithms. Investigate binary and liner searchers, and bubble, insertion and merge sort algorithms and their implementation.	Students will: Bring it all together and learn the tools to help with programming, how to test and how to use defensive design. Study interleaving topics to get a broader understanding of the world of computer science.	Students will: Complete a programming project combined with revision activities of content from the previous year. Learn the whole process of software development and review.	Students will: Revise the content for the course building up to the examinations through a range of different techniques.	