Year 9 Curriculum – 2023-2024

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	**Information Technology**	**Information Technology**	**Information Technology**	**Digital Literacy**	**Algorithms & Programming**	**Algorithms & Programming**
National Curriculum Knowledge & Understanding	**Internet of Things** Pupils will learn about the Internet of Things (IoT) and how this modern technology is used in the real world. They will produce descriptions, advantages and disadvantages of using IoT so they can ensure they are equipped for this rapidly evolving technology. They will investigate how	**Introduction to databases:** Pupils will design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. Pupils will undertake creative projects that involve collecting and analysing data and meeting the needs of known users.	**Create a 3D animation** Create, reuse, revise, and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability. They will undertake creative projects that involve selecting, using, and combining multiple applications, to achieve challenging goals, meeting the needs of known users	**Cybersecurity** Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy.	**Physical Computing** Pupils will design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. They will use programming languages, to solve a variety of computational problems; make appropriate They will design and develop modular programs that use procedures or functions	**Python: Next steps** Students will use a text-based programming language to solve a variety of computational problems, making appropriate use of data structures such as arrays and lists. They will design and develop modular programs that use procedures or functions.

	the technology is used in their lives, in the world around them, and how it can impact on their future employment opportunities.					
Assessment	Assessment via written computer based short questions and extended writing tasks	Assessment portfolio	Assessment of animation skills	Written assessment	Assessment of programming skills	Assessment of programming skills
Why this?	The Internet of Things (IoT) is a rapidly developing technology which is all around us, from video doorbells to internet enabled fridges. Students are to be made aware of the advantages and disadvantages of	Data is input into digital devices in many different forms and when processed, becomes information. Pupils should be able to identify benefits of digitising data and demonstrate skills in the use of database management	Films, television, computer games, advertising, and architecture have been revolutionised by computer-based 3D modelling and animation. In this unit pupils will discover how professionals create 3D animations using the industry-standard software package, Blender. By	Throughout their school lives pupils will be required to access secure accounts such as individual user accounts on the network and online accounts. They need to know how to keep their data safe both in and out of school. They must also understand their ethical	Pupils will get acquainted with the host of components built into the micro:bit, and write simple programs that use these components to interact with the physical world. In the process, they will refresh their Python programming skills and encounter a range of programming patterns that arise	Pupils will build upon their prior experience of programming in Python where they learnt about the basic programming constructs; sequence, selection and iteration. Pupils will be introduced to data structures to enable them to store data that has

	this new technology, as well as the job opportunities in this relatively new area of IT.	software. Pupils have already completed a spreadsheet unit that required pupils to use data to model different scenarios. This unit enables pupils to use multiple applications to collect and analyse data	completing this unit they will gain a greater understanding of how this important creative field is used to make the media products that we consume.	responsibilities regarding their conduct towards others and their respect of intellectual property when using copyright materials. Pupils may experience sexting, grooming or cyberbullying and need to be able to report concerns about their digital activity to a responsible adult.	frequently in physical computing applications. In the second half, learners will work in pairs to build a physical computing project. They will be required to select and design their project purposefully, apply what they have learnt by building a prototype, and keep a structured diary throughout the process. The Year 8 and 9 programming units are prerequisites for this unit. It is assumed that learners are already able to write Python programs that use variables and data structures to keep track of information. They are also expected to be able to combine sequence, selection, iteration, and function/method	been input by a user. Functions with and without parameters are covered to help pupils understand the concept and benefits of modular programming.

					calls to control the flow of program execution.	
Why now?	Pupils have knowledge of hardware and software in computer systems. They are aware of issues relating to their use of IT, especially in the online world. This unit takes those elements and focuses students towards the technology that is becoming ubiquitous that influences their lives without many realising. As this technology is evolving constantly, having the knowledge of the underlying	Pupils have already used spreadsheet software to enter and manipulate data. Database Management software enables pupils to create simplified abstractions of real-life systems. The use of spreadsheet and database software will prepare pupils for the content of the 'Information Technology' course at KS4	Pupils are gaining practical skills in the use of various software throughout KS3. They must now show awareness of how fit for purpose their solution is and demonstrate the ability to suggest and make valid improvements.	Pupils may begin to setup social media accounts which have a recommended age of 13+. This can be a form of freedom for pupils and they may have limited parental control. If pupils don't understand the dangers associated with being online, they may leave a digital footprint that will stay with them for the rest of their lives, potentially impacting upon future education and employment.	In order to write text based programs at KS4, students need to be able to decompose a real-world problem and plan an effective solution.	This unit is designed to take pupils right up to a point where a GCSE in Computer Science can pick up from and should provide ample experience of programming in order to confirm any decision to pursue Computer Science as a GCSE option.

	principles and technologies will ensure that students are able to understand future developments in this field. There is also a specific lesson on careers in the IoT field to ensure they are not just aware of the technology for their current programme of study but potentially also for a future career.					
Skills & Characteristics	• Awareness of future technologies • Use and understand the need for reasonable concern when developing	• Classifies different types of data (text, number) and understands how these are used in different situations. • Understands the difference between data	• Add, delete, and move objects • Scale and rotate objects • Use a material to add colour to objects • Add, move, and delete keyframes	• Critique online services in relation to data privacy • Identify what happens to data entered online • Explain the need for the Data Protection Act	• Describe what the micro:bit is • List the micro:bit's input and output devices • Use a development environment to write, execute, and debug a	• Constructs solutions (algorithms) that use repetition and multi-way selection. • Solves problems through decomposition.

	new technologies • Review existing IoT devices to assess their suitability for purpose and advantages and disadvantages of using them • Create digital documents to meet a specification • Skills Builder: ○ *Creativity* when identifying future possible used for IoT. ○ *Speaking* through class discussion and 'Think, pair, share' activities.	and information. • Knows why sorting data in a flat file can improve searching for information. • Recognises that data can be structured in tables to make it useful. • Be able to enter data into a flat file database in datasheet view. • Create queries using multiple criteria to answer questions relating to a given flat file database, using a range of different operators. • Create validation rules to prevent the	to make basic animations • Play, pause, and move through the animation using the timeline • Create useful names for objects • Join multiple objects together using parenting • Use edit mode and extrude • Use loop cut and face editing • Apply different colours to different parts of the same model • Use proportional editing • Use the knife tool • Use subdivision • Add and edit set lighting • Set up the camera	• Recognise how human errors pose security risks to data • Implement strategies to minimise the risk of data being compromised through human error • Define hacking in the context of cyber security • Explain how a DDoS attack can impact users of online services • Identify strategies to reduce the chance of a brute force attack being successful • Explain the need for the Computer Misuse Act • List the common malware threats • Examine how different types of malware causes	Python program for the micro:bit • Write programs that use the micro:bit's built-in input and output devices • Write programs that use GPIO pins to generate output and receive input • Write programs that communicate with other devices by sending and receiving messages wirelessly • Design a physical computing artifact purposefully, keeping in mind the problem at hand, the needs of the audience involved, and the available resources	• Demonstrates algorithms with increasing complexity using loops, and selection. • Detects and corrects errors i.e. debugging, in algorithms. • Designs, writes and debugs modular programs using functions. • Selects appropriate variables and relational operators within a loop to govern termination. • Identifies the differences between, and appropriately uses if and if, then and else statements, gaining practical experience of a

	○ *Listening* during class discussion and 'Think, pair, share' activities. ○ *Aiming High* when learning about technologies they have not encountered before.	user from entering invalid data. • Create parameterised queries • Create user-friendly forms and be able to find, enter, modify and delete records. • Create consistently designed reports that illustrate results of queries. • Skills builder ○ *Speaking* and *teamwork* when giving and receiving peer feedback	• Compare different render modes • Render out an animation • Skills builder: ○ *Creativity* when combining images and using tools to develop an animation. ○ *Speaking* and *teamwork* when giving and receiving peer feedback	problems for computer systems • Question how malicious bots can have an impact on societal issues • Compare security threats against probability and the potential impact to organisations • Explain how networks can be protected from common security threats • Identify the most effective methods to prevent cyberattacks • Skills builder ○ *Speaking* through class discussion and 'Think, pair, share' activities. ○ *Listening* during class discussion	• Decompose the functionality of a physical computing system into simpler features • Implement a physical computing project, while following, revising, and refining the project plan • Implement a physical computing project, while following, revising, and refining the project plan • Skills builder ○ *Problem solving* skills when forming a programmabl	high-level textual language. • Uses appropriate data structures to store and retrieve data. • Skills builder ○ *Problem solving* skills when forming a programmable solution to a problem. ○ *Aiming high* when programming solutions of increasing complexity in a text-based language.

				and 'Think, pair, share' activities. ○ *Aiming High* when producing documents using applications that they have never used before.	e solution to a problem. ○ *Aiming high* when programming solutions of increasing complexity in a text-based language	
Aspirations & Careers	• Pupils will gain an insight into the requirements of ICT/Computing based careers such as coding, network management and data management. • Online coding competitions open to all pupils. • Opportunity to attend 'ICT Live' visit to Disneyland Paris					

Computer Science End Points			
Year Group	**Basic (Lower Ability End Points)**	**Clear (Middle Ability End Points)**	**Detailed (Higher Ability End Points)**
9	• Pupils use a range of sorting and searching algorithms, selecting the most appropriate for given scenarios. • Pupils discuss the use of computing and its impact on society. • Pupils explain the importance of network security including simple security techniques. • Pupils develop, try out and refine sequences of instructions and show efficiency in framing these instructions, using sub-routines where appropriate.	• Pupils use a range of sorting and searching algorithms, justifying the most appropriate for given scenarios. • Pupils discuss the social, economic, ethical and moral issues raised by computing. • Pupils experiment with common network security methods. • Pupils develop and refine efficient sequences of instructions, using sub-routines where appropriate.	• Pupils implement and evaluate sorting and searching algorithms justifying the most appropriate for given scenarios. • Pupils discuss their own and others' uses of ICT to inform their views on the social, economic, ethical and moral issues raised by computing. • Pupils debate the ethical and moral implications on cryptography from a personal, national and world-wide standpoint.

	• Pupils understand Computer Science related legislation and its importance in society. • Pupils plan and review their work, reflecting critically to make improvements in subsequent work.	• Pupils understand that technology introduces ethical, legal, cultural, environmental and privacy issues. • Pupils design and implement systems making use of feedback to refine their solutions.	• Pupils embed additional programming techniques when developing and refining efficient sequences of instructions. • Pupils have knowledge of a variety of examples of digital technology and how they impact on wider society. They explain the purpose of legislation relevant to Computer Science. • Pupils design, implement and document systems for others to use, making use of feedback to refine and enhance their solutions..