

Key Stage 3 Curriculum Overview 2021-22

	Term 1	Term 2	Term 3
Year 7	Introduction to Python	Computer Systems	Computer Crime and Cyber Security
	<p>This is an introduction to Python, a powerful but easy-to-use high-level programming language. Although Python is an object-oriented language, at this level the object-oriented features of the language are barely in evidence and do not need to be discussed. 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 validation and searching. The pupils' final programs are put into a learning portfolio with evidence of correct running, for assessment purposes.</p> <p>These resources are written with the aim of enabling the teacher to deliver lessons on Python without necessarily giving the pupils a mountain of indigestible syntax rules, and to enable a teacher unfamiliar with Python to help pupils with problems they encounter when using the worksheets. The worksheets will need minimal introduction, making the lesson largely a process of the pupils finding out things for themselves while interacting with the computer.</p>	<p>A computer system is a collection of electronic components connected to each other that allow a person to input data that can then be stored and processed. This data will be outputted as information. Computers require programs to input, output, process and store data. Each device will perform one or more of the functions above. A computer system is incomplete if it does not contain devices that collectively perform the functions. As a minimum a computer system will contain a CPU, RAM, ROM, a hard disk drive, graphics card, monitor, mouse, and keyboard all connected to a motherboard and supplied with electricity by a power supply unit.</p> <p>The emergence of computers has had a significant impact on the environment, our energy consumption and the way we interact.</p>	<p>This unit covers some of the legal safeguards regarding computer use, including overviews of the Computer Misuse Act, Data Protection Act and GDPR and Copyright Law and their implications for computer use. Phishing scams and other email frauds, hacking, "data harvesting" identity theft and safe use of social media are discussed together with ways of protecting online identity and privacy. Health and Safety Law and environmental issues such as the safe disposal of old computers are also discussed.</p>
Year 8	Term 1	Term 2	Term 3
	Python: Next steps	Networks, HTML and Website Development	Computational Thinking and Logic
	<p>This unit assumes that pupils already have some prior experience in Python or a similar language, and the first lesson has a series of tasks designed to revisit the basic skills already covered. Pupils</p>	<p>A network is a collection of computers that are connected to share access to data and hardware devices. Specialist hardware is used to connect computers together. Networks can be built in</p>	<p>This unit introduces students to the world of computational thinking and logic. With the help of many unplugged activities, students get to understand the power of problem solving and the</p>

	<p>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. 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.</p>	<p>homes, offices, countries or globally. Each device has an address that allows it to connect and communicate with other devices. Rules must be followed in order for safe and correct communication to take place. There are many threats to the data and hardware in networks, but there are a number of steps that can be taken to reduce the risk of failure or theft. Websites are pages of information that are stored and accessed via the World Wide Web. The World Wide Web is accessed via the Internet. Web site pages are constructed using HTML, CSS and JavaScript.</p>	<p>different methods that Computer Scientists use to tackle problems. All activities that can be carried out by computer have a paper alternative.</p> <p>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</p>
Year 9	Term 1	Term 2	Term 3
	Practical programming skills in Python	Data Storage and JavaScript	AI and Machine Learning
	<p>This unit contains ten topics each guiding GCSE students through the essential programming skills required to develop their own practical projects with success and competence. The unit assumes little prior experience of Python and gradually builds up proficiency in ten key skill areas including file handling, validation and working with lists. The practical application of each of the skill areas covered will also assist students with their understanding of the theoretical examination questions required of all the (9-1) GCSE and IGCSE specifications.</p> <p>The unit concludes with exemplar solutions to five projects which each demonstrate different applications of the major skills commonly required at this level.</p>	<p>Computers store data using transistors. A transistor is a semiconductor device used to amplify or switch electronic signals. These signals are interpreted using binary numbers. Other storage media use similar binary systems to represent data. Data is increasingly stored on network based storage devices that are accessed remotely. Data stored on digital devices must be protected and there are digital and legal ways to do this.</p> <p>JavaScript is a programming language that is used to create web pages that are dynamic and interactive. JavaScript provides syntax to output text, create variables, perform calculations, create functions, respond to events, and use conditional statements to select or repeat instructions.</p>	<p>This unit gives students a first insight into the fascinating world of Artificial Intelligence and Machine Learning. Pupils begin by considering where AI is used from simple problems such as solving a maze to those more advanced, such as self-driving cars. Students will then look at how machine learning and deep learning are used in image recognition. This is a fast moving area of development, so the Ethics of AI is considered. The following lessons give an opportunity to develop AI programs such as a simple image recognition system, a virtual assistant and a sentiment analysis system for film ratings.</p>