MOOR PARK HIGH SCHOOL: CURRICULUM

Key Stage 4 Long Term Planning

Year 10 SYLLABUS: Pearson/Edexcel GCSE Computer Science.

Year 10 INTENT: Students will deepen their understanding of algorithms, data representation, and computer systems while advancing their programming skills using Python. They will learn to read and write code from pseudocode and flowcharts, apply key programming constructs, and explore how computers process and store data in binary. Through practical tasks, students will develop problem-solving skills, understand hardware and software components, and prepare for assessments using real-world examples and exam-style questions. Regular homework and enrichment opportunities, such as coding clubs and industry workshops, will support their progress and engagement.

Curriculum Area: Mathematics, Enterprise and Computing

Year 10	Autumn Term		Spring Term		Summer Term	
Syllabus	**Topic 1: Computational Thinking**	**Topic 6 – Programming**	**Topic 2 – Data Representation**	**Topic 6 – Programming**	**Topic 3 – Computer Systems**	**Topic 6 – Programming**
Knowledge	Pupils will learn about algorithms and how they are used in everyday life. They will understand how computers use algorithms to process any actions. They will also understand how to decompose a problem.	Students will be introduced to Python as a high-level, text-based programming language. They will learn how to write and read programs using variables, data types, arithmetic operators, sequence, selection and simple iteration, and will develop their understanding through structured tasks and guided practice.	Pupils will be able to explain how binary is used and how data is represented in different formats by a computer. Students will develop their programming knowledge as they look to move onto more advanced features of python and be able to create and read programs based on pseudocode and flowchart algorithms.	Students will develop their Python skills by writing more complex programs that use iteration, string manipulation, user input and validation. They will also learn how to read and write data using CSV files and apply authentication techniques within their programs.	Pupils will be able to explain the hardware and software required to make a computer functional. They also be able to explain different types of programming languages. Students will develop their programming knowledge as they look to move onto more advanced features of python and be able to create and read programs based on pseudocode and flowchart algorithms.	Students will extend their Python knowledge by designing and using subprograms, including functions that return values and procedures that do not. They will understand the use of parameters, the difference between local and global variables, and how to use both built-in and custom subprograms to write modular, well-structured code.
Skills	Students should understand how to break down and simplify problems using decomposition and abstraction, and how subprograms help structure solutions. They should be able to follow and write algorithms using key programming structures, data types and operators, trace and debug logic, and apply standard searching and sorting algorithms to solve problems. They should also be able to use	Students should be able to solve problems and write, read, and improve programs using a high-level language. They should convert algorithms into code, make programs readable, fix errors, and test for efficiency. They also need to understand key programming structures like variables, loops, and subprograms.	Students should understand how computers use binary to represent data and instructions, and how to convert between binary, denary, and hexadecimal. They should be able to perform binary arithmetic, apply shifts, and understand overflow. They also need to know how text, images, and sound are stored in binary, how to calculate file sizes, and the importance of compression methods like lossy and lossless.	Students should be able to write programs using sequencing, selection, repetition, and iteration, with clear entry and exit points. They should use appropriate data types, variables, and constants, manipulate strings, handle user input, and work with CSV files. Programs should include validation and authentication where needed.	Pupils will be able to explain the hardware and software required to make a computer functional. They also be able to explain different types of programming languages. Students will develop their programming knowledge as they look to move onto more advanced features of python and be able to create and read programs based on pseudocode and flowchart algorithms.	Students should be able to write programs using relational and logical operators and use both built-in and custom subprograms. They should understand how to create functions that return values and procedures that don't, with or without parameters. They also need to know when to use global or local variables appropriately.

	flowcharts and pseudocode to design and communicate solutions clearly.						
Connections to previous learning	In Key Stage Three, students are taught about the elements of computational thinking (abstraction and decomposition) and are also taught about searching and sorting algorithms alongside key programming elements as well.	In KS3, students will have been taught how to develop programs using Python in both year 8 and 9, in KS4 they will build upon this which is essential for their practical programming exam in year 11.	In Year 8, students will learn the fundamentals of data representation so they should be able to explain what binary is and be able to convert between binary and denary numbers and be able to perform calculations using them.	In KS3, students will have been taught how to develop programs using Python in both year 8 and 9, in KS4 they will build upon this which is essential for their practical programming exam in year 11.	In year 9 students will be introduced to the hardware and software of a computer which will allow them to carry their knowledge and understanding of how computers work through to KS4.	In KS3, students will have been taught how to develop programs using Python in both year 8 and 9, in KS4 they will build upon this which is essential for their practical programming exam in year 11.
Assessment	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to assess self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to assess self-assess knowledge. Common assessment points will take place at the end of each half term to assess the knowledge they have learnt over the half term.
Homework	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.
Culture Capital	Bebras Computational Thinking Challenge; explore how algorithms	Raspberry Pi Foundation coding challenges; explore the story of Grace Hopper	Explore how Spotify and Netflix use compression to stream media; CS Unplugged activities	Enter a coding competition such as Bebras or UKMT; explore how Python is used in real-world data	Virtual tour of a Google or AWS data centre; explore how computer hardware has evolved	CyberFirst coding workshops; explore how software engineers at companies like GCHQ use

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	power everyday tools like Google Maps and Netflix recommendations	and the first computer bug	on binary and data	science and AI	from room-sized machines to smartphones	subprograms and modular design
Numeracy	Students will use numeracy when tracing algorithms, counting steps and comparing the efficiency of different solutions using logical reasoning	Students will use numeracy when working with variables, data types and arithmetic operators, and when evaluating program logic through trace tables	Students will apply numeracy through binary and hexadecimal conversion, binary arithmetic, applying bit shifts and calculating file sizes for images, audio and text	Students will use numeracy when working with iteration counts, string lengths, index positions and conditional expressions in their programs	Students will use numeracy when comparing clock speeds, cache sizes and storage capacities, and when interpreting how binary logic underpins hardware architecture	Students will use numeracy when designing functions with parameters, evaluating return values and reasoning about scope and variable behaviour across subprograms
Literacy	Students will develop literacy by learning and using key vocabulary such as abstraction, decomposition, algorithm, pseudocode and flowchart, and by explaining their problem-solving approach in writing	Students will develop literacy by reading and interpreting programming tasks and using precise technical vocabulary such as variable, iteration, selection, syntax and logic error	Students will develop literacy by using subject-specific terminology such as binary, denary, hexadecimal, bit, byte, sampling rate and colour depth, and by explaining data concepts clearly in written responses	Students will develop literacy by writing clear annotations and comments within code and by constructing extended written responses to exam questions about programming techniques	Students will develop literacy by learning and using vocabulary linked to hardware and software, such as CPU, fetch-decode-execute, register, cache, operating system and utility software	Students will develop literacy by explaining the purpose of subprograms clearly in writing, using vocabulary such as function, procedure, parameter, return value, local and global variable
CEIAG	Students will understand that computational thinking underpins careers in software engineering, data analysis, AI research and game development	Students will understand that programming skills are essential in careers such as software development, app design, cyber security and robotics engineering	Students will understand that knowledge of data representation is important in careers such as network engineering, audio/visual production and computer hardware design	Students will understand that advanced programming skills open pathways into careers including software development, data science, machine learning and systems engineering	Students will understand that hardware and software knowledge supports careers in IT support, computer engineering, systems administration and embedded systems design	Students will understand that modular programming and problem-solving skills are valued in careers across software development, finance technology and digital product design

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Year 11 SYLLABUS

Year 11 INTENT: Students will deepen their understanding of computer networks and the societal impact of technology, while revisiting and consolidating key GCSE topics in preparation for final assessments. They will explore how networks are structured, compare wired and wireless systems, and evaluate network security and ethical considerations. Through structured revision, students will strengthen their knowledge of data representation, computer systems, and computational thinking, including programming techniques and problem-solving strategies. Regular assessments, homework, and enrichment opportunities such as coding clubs and guest workshops will support their progress, while literacy and exam technique will be embedded throughout to enhance written and analytical skills.

Curriculum Area: Mathematics, Enterprise and Computing

Year 11	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1
Syllabus	**Topic 4: Networking**	**Topic 5: Issues and Impact**	**Revision – Topics 2 and 3**	**Revision Topics 4 and 5**	**Revision – Paper 2 / Topic 1**
Knowledge	Pupils will understand how networks are created and analyse the different types. They will be able to comprehensively explain the differences between wired and wireless connections. They will also be able to explain issues surrounding the security of networks and how they are kept safe.	Students will explore the impact of technology on individuals, society and the environment. They will learn about the ethical, moral and legal issues surrounding the use of technology, including intellectual property, data privacy, cybercrime legislation and the Computer Misuse Act. They will also consider the environmental impact of technology, including energy consumption, the replacement cycle and responsible disposal of devices, and will evaluate the role of AI, machine learning and robotics in modern society.	Revisiting of key GCSE units in order to consider identified gaps and other areas for development. Students will focus on Data and Computer Systems within this half term.	Revisiting of key GCSE units in order to consider identified gaps and other areas for development. Students will focus on Networking and Issues and Impact	Revisiting of key GCSE units in order to consider identified gaps and other areas for development. Students will focus on Computational Thinking and Programming
Skills	Pupils will be able to form different network topologies. They will be able to recommend a type of network in each scenario. They will recognize the different components on the internet. Pupils will develop their exam answering technique in preparation for 6-mark questions.	Pupils will be able to recommend how to become more energy efficient when using a computer. They will also be able to explain the ethical, moral and legal issues on society. Pupils will develop their exam answering technique in preparation for 6-mark questions.	Students will recap: 1. Binary representation 2. Two complements 3. Binary additions 4. Overflows 5. Hexadecimal conversion 6. ASCII 7. Bitmap images 8. Binary as sound 9. Data Storage 10. Von Neumann cycle 11. Address bus, data bus and control bus functions	Students will recap: 1. Network 2. LAN/WAN 3. IP Address/Routers 4. Wired and Wireless Networks 5. Network speeds 6. Protocols 7. TCP/IP model 8. Network Topologies 9. Network security and Network vulnerabilities 10. Energy consumption/manufacturing	Students will recap: 1. Abstraction and decomposition 2. Subroutines 3. Flowcharts 4. Variables and Constant 5. Arithmetic Operators 6. Trace Tables 7. Syntax, Logical and runtime errors 8. Sort and searches 9. Logical gates 10. Decomposition

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			12. Embedded systems 13. Operating systems 14. Scheduling algorithms 15. Utility software 16. High level and low-level programming 17. Code reviews and audit trails 18. Translators	11. Replacement cycle 12. Disposal 13. Personal data 14. A.I./Machine learning 15. Robotics 16. Intellectual property 17. Treats to digital systems 18. Methods of protecting digital systems	11. Abstraction 12. Refining programs 13. Convert algorithms 14. Programming techniques 15. Programming errors 16. Logical reasoning
Connections to previous learning	Students will build on the knowledge on networks taken from the KS3 unit in year 9. They will also continue working on problem solving and programming which they will learn continuously throughout KS4.	Students will have some prior knowledge of the impact and issues of technology; this will be briefly covered in Y7 e-safety and Y9 computers. Students may also hear about the impact of technology in the news. They will also continue working on problem solving and programming which they will learn continuously throughout KS4.	Students will have covered data representation and computer systems in Y10. These revision lessons build on that prior learning, using PLC checklists to identify and address individual gaps in knowledge before the final examinations.	Students will have studied networking and issues and impact earlier in Y11. These sessions consolidate that learning and draw connections between topics, helping students develop the ability to apply knowledge across question types in both papers.	Students will have developed computational thinking and programming skills throughout KS3 and KS4. This final revision block draws together all prior learning, with a focus on applying problem-solving and programming techniques confidently under exam conditions.
Assessment	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to self-assess knowledge. The assessment will be based on a random selection of previous topics.	Pupils will be required to complete an assessment based on the previous unit and prior knowledge using exam styles questions. PLC checklists will be used to assess self-assess knowledge. The assessment will be based on a random selection of previous topics.	Past Paper Exam Questions and timed assessment practice will be completed. PLC checklists will be used to assess self-assess knowledge	Past Paper Exam Questions and timed assessment practice will be completed. PLC checklists will be used to assess self-assess knowledge	Past Paper Exam Questions and timed assessment practice will be completed. PLC checklists will be used to assess self-assess knowledge
Homework	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Homework will be issued each week. This will build and extend learning in this topic. Homework will consist of a mixture of past paper questions, online programming tasks, independent research, flipped learning and GCSE POD.	Y11 revision plan produced. Students should complete the weekly tasks in the plan. This will include PPQs, GCSE Pod activities, MCQs etc.	Y11 revision plan produced. Students should complete the weekly tasks in the plan. This will include PPQs, GCSE Pod activities, MCQs etc.	Y11 revision plan produced. Students should complete the weekly tasks in the plan. This will include PPQs, GCSE Pod activities, MCQs etc.
Culture Capital	Talk from school network/IT manager about real server infrastructure; explore how undersea cables connect the global internet	Invite a CAS specialist or local industry professional to discuss AI ethics; explore real news stories about data privacy and the law	Coding club with a focus on exam-style problem solving; explore careers in hardware engineering and systems architecture	Business case study on a real cyber attack (e.g. NHS WannaCry); explore careers in cyber security and network engineering	Mock interview practice for computing-related apprenticeships or sixth form courses; explore university computer science taster days
Numeracy	Students will use numeracy when calculating network	Students will use numeracy when interpreting statistics about	Students will revisit and consolidate numeracy skills including binary	Students will revisit numeracy related to network performance, data transfer and	Students will revisit numeracy skills embedded in algorithm tracing, logic gate

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	speeds and data transfer rates, converting between units of data and interpreting IP addressing and subnet values	energy consumption, device replacement cycles and the economic impact of technology on society	arithmetic, two's complement, hexadecimal conversion and file size calculations	storage, applying these to exam-style calculation questions	truth tables and evaluating program efficiency through step counting
Literacy	Students will develop literacy by learning and using vocabulary linked to networking, such as topology, protocol, TCP/IP, packet switching, encryption and network vulnerability	Students will develop literacy by constructing balanced arguments about the ethical, moral and legal impact of technology, using vocabulary such as intellectual property, privacy, legislation and sustainability	Students will develop literacy by practising extended writing responses to exam questions, focusing on precise use of technical vocabulary and clear explanation of complex concepts	Students will develop literacy by reviewing and improving their written exam technique, particularly for 4 and 6 mark questions requiring clear, structured responses	Students will develop literacy by articulating their programming decisions clearly, using correct technical language and constructing well-reasoned written justifications for algorithmic choices
CEIAG	Students will understand that networking knowledge supports careers in network engineering, cyber security, cloud computing and IT infrastructure management	Students will understand that awareness of legal, ethical and societal issues is important in careers such as data protection law, AI ethics, digital policy and cyber security	Students will reflect on their GCSE learning and begin to consider pathways into A-Level Computer Science, T-Level Digital, apprenticeships or computing-related further education	Students will explore how GCSE Computer Science supports entry into higher education courses such as Computer Science, Software Engineering and Cyber Security	Students will consider how the skills developed across KS4 — problem solving, logical thinking, programming — are valued across a wide range of industries and career pathways