

Subject	Computing & Computer Science
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Long-term Curriculum Map



1st Form	Term	Michaelmas 1	Michaelmas 1	Michaelmas 2	Lent 1 & 2	Trinity 1	Trinity 2
	Unit Title	Understanding Computers & Online Safety	Computer Networking	Data Modelling	Introduction to Programming	Graphics	Animation
		This unit of work introduces pupils to using the school network safely. Important issues such as grooming, cyber bullying and other internet risks are discussed. As well as the importance of meeting legal requirements with internet content	Pupils will look at the hardware and software required to create a computer network. Also, they will look at different types of network including the Internet and the protocols required for network communication.	Pupils have the opportunity to organise data in a spreadsheet in a useful/logical manner. To use formatting and formulae and then to test the spreadhseet created works correctly.	Using computational thinking to solve problems with a practical application. Consider how algorithms are used to create programs. Learn about the importance of testing and debugging a program.	Pupils learn about the different type of digital graphics and their use. Then they create different types of digital graphics.	Pupils will use the skills that they developed creating a graphic to create a simple animation.
	CAT TEST			CAT 1 - Understanding Computers, Online Safety, Computer Networking and Data Modelling			CAT 2 - End of Year

2nd Form	Term	Michaelmas 1	Michaelmas 2	Lent 1	Lent 2	Trinity 1	Trinity 2
	Unit Title	Introduction to Python Programming	Developing for the web	Cyber Security	App Development	Introduction to AI	Creating a Visual Identity
		How to construct a computer program with different data types. Experience writing a simple computer program using different data types. Make choices about what data types to use and concatenate strings and variables.	Developing for the web looks at how HTML creates web pages. How images can be used on web pages. How the design of the web page can be controlled by Cascading Style Sheets (CSS). Finally researching how to efficiently search the internet.	Pupils will learn about protecting their data, types of cyber security risks such as social engineering and the current online risks that exist.	Pupils will use block based coding to solve the problem of creating an app to a set of specifications. Pupils have an opportunity to look at the textural code that the block code produced to develop their understanding of the key concepts of: sequence, selection and iteration.	An introduction to the world of artificial intelligence (AI) and machine learning (ML). Throughout this unit, pupils will experience a variety of real-world AI applications and be made aware of the ever-increasing range of AI-related careers. As well as considering the social and ethical implications of AI developments.	Pupils will have the opportunity to develop a product in line with a client brief. Using such tools as mood boards to help develop a logo to be applied to a specified product.
	CAT TEST		CAT 1 - Programming and Developing for the Web				CAT 2 - End of Year

3rd Form	Term	Michaelmas 1	Michaelmas 2	Lent 1	Lent 2	Trinity 1	Trinity 2
	Unit Title	Programming in Python Part I	Promoting a Cause	Programming in Python Part II	Creating Databases & Using Logic	Data Representations & Algorithms	Graphic Design
		Exploring the basic logical structures in computer programming: • Sequence: running instructions in order. • Selection: making choices. • Repetition: doing the same thing more than once. Adding to these concepts the ability to deal with inputs, outputs and to store data provides the tools to solve many computing problems.	Pupils will learn how media is used to gain support for a cause. As well as learn about the legal use of content created by others, such as: images, videos and text, and the importance of making sure the content is accurate	Programming in Python to experience how elements of real life can be represented in programming. Using procedures and functions, and testing and improving programs. As well as Introducing the concepts of searching and sorting.	Databases allows the creation of databases and the querying of them to produce specific outputs. Logic Gates and Boolean Logic offers the pupil practical application of Boolean logic (AND, OR, NOT) through complex queries and the use of logic gate symbols to create logic circuits.	Data representation & Boolean logic develops a pupil's understanding of manipulating binary numbers, converting from denary to binary, from binary to denary, adding in binary and binary shifts (multiplication and division). Then moving on to study digital sound and digital image files.	Pupils learn about the different type of digital graphics and their use. Then they create different types of digital graphics and animations.
	CAT TEST		CAT 1 - Programming in Python				End of Year Exam

4th Form	Term	Michaelmas 1	Michaelmas 2	Lent 1	Lent 2	Trinity 1	Trinity 2
		Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage
	Unit Title	Systems Architecture, Memory and Storage	Data Represenation	Computer Networks, Connections and Protocols	Network Security & Systems Software	Algorithms	Algorithms
		Covers the purpose of the CPU. The components of the CPU and Von Neuman architecture. Commoncharacteristics of the CPU and how it affects their performance. The characteristics of embedded systems. The purpose, characteristics and types of memory. The purpose common types of storage and their use.	Learning about units of data storage, and calculations to meet data capacity requirements. Binary and hexadecimal looking at converting numbers to and from these bases as well as binary addition and binary shift. The storage of characters, images and sound and how they can be compressed.	Considering local and wide area networks, factors that affect network performance. Different types of networks and topolgies. As well as the hardware required to build a network. The modes of connection and the protocols and layers required.	Network security looks at the threats to computer systems and how to prevent them. The purpose and functions of the operating system. The different types and purpose of utility software.	Computational thinking using: abstraction, decomposition and algorithmic thinking. Designing, creating and refining algorithms using pseudocode, flowcharts and reference language. Identifying common errors and using trace tables.	Standard searching and sorting algorithms. Linear search, binary search, bubble sort, insertion sort and merge sort.
		Programming Fundamentals	Programming Fundamentals	Programming Fundamentals	Boolean Logic, IDEs, and Programming Languages	Programming Fundamentals	Producing Robust Programs
		The use of variables, constants, operators, inputs, outputs and assignments. The use of the programming constructs: sequence, selection and iteration. The use of common arithmetic operators and Boolean operators AND, OR and NOT.	The use of different data types including integers, reals, Boolean, Characters and Strings and how to cast them.	The use of basic string manipulation and basic file handling operations including open, read, write and close. The use of records to store data.	Using AND, OR and NOT to create logic diagrams/circuits and solve truth tables. To identify the difference between high and low level alanguages and understand the purpose of a translator and the characteristics of a compiler and an interpreter. To be familiar with the tolls and facilities available in an Integrated Development Environment (IDE).	The use of arrays, lists and tuples for problem solving. Including one and two dimensional attrays. The use of sub-programs (functions and procedures) to produce structured code. As well as random number generation.	Using defensive design, valiation techniques and structuring programs to aid their maintainability. The importance of and different types of testing and selecting suitable data for testing and using the results to improve and refine a computer program. Identifying different errors.
	GAT TEST	End of Topic Test	GAT 1 & Two End of Topic Tests	Two End of Topic Tests	Two End of Toic Tests	GAT 2	Two End of Topic Tests

5th Form	Term	Michaelmas 1	Michaelmas 2	Lent 1	Lent 2	Trinity 1	Trinity 2
		Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage	Curriculum/Syllabus Coverage		
	Unit Title	Ethical, legal, cultural and environmental impacts of digital technology	Component 1 Revision: Computer Systems	Component 1 Revision: Computer Systems	Component 1 Revision: Computer Systems		
		Impacts of digital technology on wider society. Looking at ethical, legal, cultural, environmental and privacy issues. Legislation relevant to Computer Science: The Data Protection Act, The Computer Misuse Act, Copyright, Designs and Patents Act and types of Software licences.	Revision of 4th form content: Systems Architecture, Memory and Storage, Computer Networks, Connections and Protocols, Network Security and Systems Software.	Revision of 4th form content: Data Representation, Boolean Logic, IDEs and Programming Languages.	Revision of 4th form content: Ethical legal, cultural and environmental impacts of digital technology.		
		20 Hour Programming Project	Component 02: Computational Thinking, Algorithms and Programming	Component 02: Computational Thinking, Algorithms and Programming	Component 02: Computational Thinking, Algorithms and Programming		
		Pupils embark on a 20 hour programming project following the software development structure of analysis, design, development, testing and evaluation.	Revision of 4th form content: Programming Fundamentals, using sequence, selection and iteration. Using Standard Algorithms.	Revision of 4th form content sting manipulation and file handling. Using Standard Algorithms.	Revision of 4th form content Producing Robust Programs and Using Standard Algorithms.		
	TRIAL EXAMS	End of Topic Test	TRIAL EXAMS				