

# Computing Department

## Curriculum Overview:

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Please see the department MTP for a more in depth scheme of work.

Year	Term	Unit/s of Work	Core Knowledge & Concepts	Core Skills
7	1.1	E-safety and cyberbullying Make a booklet for year 6 students and a video for year 7 students.	Understand how to use technology safely, respectfully, responsibly and securely, including protecting online identity  Understand how the design we create in important for connecting with an audience	Browse safely and recognise potential dangers of online use. Know what to do in situations where you are being bullied or abused through the internet.  Key design rules in relation to audience, being able to use publisher and Powtoons to create effective designs
		Merging animals (Photoshop)	Create multi-layered photoshop files with blending.	Resize canvas and images and save them in appropriate formats (psd, jpeg, png).  Layers, tools, selections, filters, fonts and colours.
	2	Scratch, Littlebits, microbits and drones	Learning how to use programming skills to create code and create games	Planning, problem solving, team work
	3	3d design (Google Sketchup) and 3d printing	How can we rapidly prototype a design? How are buildings designed and represented in 3d?	Use a variety of tools to create an accurate model of an object; rectangle, line, push/pull, scale, follow, measure.
8	1	Spreadsheets (Excel/Google sheets)	Modelling real life situations. Using labour saving features of a spreadsheet program.	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems
		Advanced visual programming (Scratch)	Procedures, modularity, lists, generating random numbers, cloning, messaging.	Make appropriate use of data structures such as lists, tables and arrays; design and develop modular programs that use procedures or functions.
	2	Code documentation and tutorial making (Scratch)	How do programmers document their code? How can we teach others to write code?	Document code to make it understandable for other programmers. Create tutorials that guide new coders through creating programs.
		Game design project (Scratch)	What are sub-genres of computer gaming? Why are they so popular? What are the initial design stages of creating a game? How is a game developed? How is a game tested?	Design, create, build, test and review a computer game using a variety of software packages.
	3	App development (App inventor)	Interface design, naming conventions, loops and procedures.	Understand several key algorithms that reflect computational thinking; use logical reasoning to compare the utility of alternative algorithms for the same problem.
		Controversial Issue (digital literacy)	Using the internet to research information on a controversial issues. The students are not allowed to be Bias in their arguments	Internet research skills, bias, reliability of data, referencing sources
9	1	Tech of the future research	What will the future be like? What kinds of technology will we be using in 50 years time? Looking at transport, communication, artificial intelligence, entertainment and medicine.	Evaluate lines of inquiry efficiently to interrogate information. Analyse how new technologies could be used and evaluate their potential impact.
		Web design (Adobe dreamweaver)	How to build a website? What is HTML? What is CSS? Build a website using tables and CSS and be able to edit	Create, re-use and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and

At ASCOT, students develop according to their needs in a welcoming, family environment. The challenging curriculum enables our students to become adaptable lifelong learners. Our intercultural ethos strives to promote a strong sense of respect for all.

			HTML. Add appropriate media to enhance the design and usability.	usability.
	2	Digital Citizenship	What makes a model digital citizens? What are the implications of a digital footprint?	Understand and evaluate what being a digital citizen is and recognise the consequences and implications of a digital footprint
		3D photography map (Holobuilder)	What is a 3d photograph and how can it be used? How can we create interactive tours through the use of 3d?	Using personal devices to take 3d photographs. Uploading those photographs onto computers and using holobuilder to create an interactive 3d tour of the school.
	3	Advanced app development (App inventor)	What sensors and features does a device have? Types (strings, integers, floats, arrays) RGB. Efficiency in coding.	Combining sensors and device features to create apps and tools that have real world functionality.

Year	Term	Unit/s of Work	Core Knowledge & Concepts
10	1	Algorithm design and programming (unit 7)	Algorithms and flowcharts Selection and Iteration Data types and arrays Testing Effectiveness of algorithms
		Data representation (Unit 1)	Binary systems Hexadecimal and ASCII Representation of images Representation of sounds Data compression
	2	Hardware (Unit 3)	Boolean logic Universal gates Computer architecture - Memory Storage devices
		Communication and Internet Technologies (Unit 2)	Data transmission Error checking and correction Introduction to the internet Internet principles of operation Security aspects HTML
3	Input and output devices (Unit 4)	Scanners and cameras Manual input devices Sensors Printing technology Speakers and screens	
11	1	Software and security (Unit 5)	Types of software Operating systems High and low level languages Keeping data safe Threats to online data Online system security
		Ethics (Unit 6)	Copyright and plagiarism The spread of computer systems Issues of electronic communication
	2	System design and databases (Unit 8)	Computer systems Top-Down design Validation and verification Designing a database table Querying a database

Year	Term	Topics of Work	Core Knowledge & Concepts
12	1	Computational thinking (Topic 4)	General principles <ul style="list-style-type: none"> <li>Thinking procedurally</li> <li>Thinking logically</li> <li>Thinking ahead</li> <li>Thinking concurrently</li> <li>Thinking abstractly</li> </ul> Connecting computational thinking and program design Introduction to programming Use of programming languages
		Control (Topic 7)	Centralized Control systems Distributed systems

			<p>Sensors, actuators and transducers</p> <p>Input devices</p> <p>Open loop control systems</p> <p>Closed loop control systems</p> <p>Feedback</p> <p>Autonomous agents</p>
	2	System fundamentals (Topic 1)	<p>Systems in Organisations</p> <ul style="list-style-type: none"> <li>• Planning and system installation</li> <li>• User focus</li> <li>• System backup</li> <li>• Software deployment</li> </ul> <p>System design basics</p> <ul style="list-style-type: none"> <li>• Components of a computer system</li> <li>• System design and analysis</li> <li>• Human interaction with the system</li> </ul>
		Networks (Topic 3)	<p>Network fundamentals</p> <p>Data transmission</p> <p>Wireless networking</p>
	3	Resource management (Topic 6)	<p>System resources</p> <p>Roles of the operating system</p>
		Computer Organisation (Topic 2)	<p>Computer architecture</p> <p>Secondary memory</p> <p>Operating systems and application systems</p> <p>Binary representation</p>
13	1	Option D: Object oriented programming	<p>Objects as a programming concept</p> <p>Features of OOP</p> <p>Program development</p>
		Abstract data structures (Topic 5)	<p>Thinking recursively</p> <p>Abstract data structures (2D arrays, stacks, queues)</p> <p>Linked lists</p> <p>Double/circular linked lists</p> <p>Binary trees</p> <p>Binary search trees</p> <p>Dynamic vs static data structures</p>
	2	Option D: Object oriented programming HL extension	<p>Advanced program development</p>
		Case study	<p>Changes each year - No common themes or topics.</p>