Curriculum overview

Subject	Computing	Year group	7

Vision statement:	At Landau Forte our curriculum exists to ensure all students regardless of background and ability have the opportunity to unlock their potential. We are committed to students being challenged from their previous key stage learning experiences. Our broad and balanced curriculum is ambitious, coherently planned and sequenced, and will provide the platform for preparing students with the foundations for examination success. Our Curriculum Intent has been informed by a wide variety of researchers and is steeped in evidence based research. Christine Counsell summarises the aspiration of our curriculum to empower all learners creating a pathway to success in university, their career and life: *'A curriculum exists to change the pupil, to give the pupil new power. One acid test for a curriculum is whether it enables even lower attaining or disadvantaged pupils to clamber into the discourse and practices of educated people, so that they gain powers of the powerful.'* As well as excellent academic success we aim to ensure our students leave us as polite and well-rounded young adults. Our new core values of Compassion, Courage and Curiosity are currently being embedded throughout our curriculum offer to ensure we continue to meet our social, emotional, spiritual and moral obligations.
Curriculum intent:	Computing will be central to everything students do in their future lives. This subject gives students the opportunity to utilise technology to enhance the way they live and work. It will also be used as a lens to develop their understanding of the world around them. *In essence, computing should be seen as an underpinning subject that facilitates new learning and thinking in all other areas. The computer should be a tool that pupils use in the same way as a calculator or a pen.* As outlined within the National Curriculum: "A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems." The core of computing is **computer science**, in which students are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, students are equipped to use **information technology** to create programs, systems and a range of content. Computing also ensures that students become **digitally literate** – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. The need to use technology with care and compassion should be considered throughout all lessons.

Threshold Concepts (TCs):	1. We present information for an audience, not ourselves, though what we present is a reflection on us in the real world 2. Computer don't provide us with answers; we need to build models that help us explore answers 3. Solutions to problems already exist – we just need to spot where this has happened before and adapt them, (pattern recognition and creating adapted algorithms) 4. We can copy other peoples' work as long as we give credit from where we got it from 5. One big problem is just lots of smaller, easier-to-solve problems, (decomposition) 6. Your computer directly connects to another in any place in the world
KS2 National Curriculum summary:	A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. Pupils should be taught to: • design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
Learner skills:	CRITICAL THINKING ORACY COLLABORATION SELF QUIZZING ADAPTABILITY ORGANISATION

	Term 1 Aug-Oct	Term 2 Nov-Dec	Term 3 Jan-Feb	Term 4 Mar-Apr	Term 5 Apr-May	Term 6 Jun-Jul
The Big Question	**How do we use computers?**					
Big picture questions:	**How are we judged online?**	**How can we represent the real world in the digital one?**	**What are computer programs?**	**How do we make our arguments more convincing?**	**How can computer programs be made to solve bigger, more complex problems?**	**How are all the computers in the world connected?**
Content (Linked to TCs):	TC1 • How to create a memorable and secure password for an account on the school network • What the rules of a computing lab are • How to find personal documents and common applications • What the features of a respectful email are • How to construct an effective email and send it to the correct recipients • How to plan effective presentations for a given audience • What cyberbullying is • What he effects of cyberbullying are • How to check who you are talking to online	TC2 • What columns, rows, cells, and cell references in spreadsheet software are • How to use formatting techniques in a spreadsheet • How to use basic formulas with cell references to perform calculations in a spreadsheet (+, -, *, /) • How to use the autofill tool to replicate cell data • What the differences between data and information are • What the difference between primary and secondary sources of data are • How to collect data • How to analyse data • How to create appropriate charts in a spreadsheet • How to use the functions SUM, COUNTA,	TC3 • How humans and computers understand instructions • That computers follow the control flow of input/process/output • The definition, prediction and use of sequences • How variables are used within programs • How to trace the values of variables within a sequence • How to make a sequence that includes a variable • That a condition as an expression that will be evaluated as either true or false • That selection uses conditions to control the flow of a sequence • Where selection statements can be used in a program	TC4 • How to identify the most appropriate software to use to complete a task • What the key features of a word processor to format a document and use them to format a document • How to compare formatting techniques • How to select appropriate images for a given context • How to apply appropriate image formatting techniques • What licensing issues there are regarding online content • How to credit the original source of an image • How to critique digital content for credibility • How to apply techniques in order to	TC5 • That a subroutine is a group of instructions that will run when called by the main program or other subroutines • That decomposition is breaking a problem down into smaller, more manageable subproblems • How subroutines can be used for decomposition • Where condition-controlled iteration can be used in a program • How to implement condition-controlled iteration in a program • Which type of iteration is required in a program • That a list is a collection of related elements that are referred to by a single name • What need there is for lists in programs	TC6 • What a computer network is and explain how data is transmitted between computers across networks • What a 'protocol' is and provide examples of non-networking protocols • What hardware is necessary for connecting devices on a network • How to compare wired to wireless connections and list examples of specific technologies currently used to implement such connections • What 'bandwidth' is • What the internet is • How data travels between computers across the internet • What the difference between the internet, its services, and the World Wide Web are

		MAX, and MIN in a spreadsheet • How to use a spreadsheet to sort and filter data • How to use the functions AVERAGE, COUNTIF, and IF in a spreadsheet • How to use conditional formatting in a spreadsheet	• How to create conditions that use comparison operators • How to create conditions that use logic operators • That iteration is a group of instructions that are repeatedly executed • Why iteration is needed • Where count-controlled iteration can be used in a program • How to implement count-controlled iteration in a program • How to detect and correct errors in a program • How to design and apply programming constructs to solve a problem	identify whether or not a source is credible • How to apply referencing techniques • What the concept of plagiarism is • How to evaluate online sources for use in own work • How to construct a blog using appropriate software • How to organise the content of the blog based on credible sources • How to apply referencing techniques that credit authors appropriately • How to design the layout of the content to make it suitable for the audience	• When lists can be used in a program • How to use a list • How to decompose a larger problem into smaller subproblems • How to apply appropriate constructs to solve a problem	• Different internet services and the context in which they are used • That 'connectivity' is the capacity for connected devices ('Internet of Things') to collect and share information about people with or without their knowledge (including microphones, cameras, and geolocation) • How internet-connected devices can affect people • What different network components are (servers, browsers, pages, HTTP and HTTPS protocols, etc.) and how they work together

Vocabulary Instruction:	Computing, password, secure, hazards, email, recipient, network, online, comments, community, cyberbullying, presentation software, slide deck, audience, catfishing	Data, cell, cell reference, row, column, range, select, drag handle, autofill, formula, information, source, primary source, secondary source, chart, pie chart, bar chart, series, axis/axes, labels, headers, function, maximum, minimum, header, filter, average, criterion/criteria, condition, conditional formatting	Computer, system, device, program, software, instructions, data, hardware, processor, memory, storage, communication, input and output, architecture, operating system, logical operators (NOT, AND, OR), logical expressions, truth values (true, false), truth tables, logic gates, logic circuits, artificial intelligence, machine learning, training, testing, programming, free and open source software	Application software, word processor, formatting, fonts, icons, appropriate, copyright, licensing, Creative Commons, text wrapping, cropping, recolouring, credibility, source, audience, plagiarism, referencing, citation, paraphrase, blog, assessment criteria, feedback, summative	Subroutine, decomposition, subproblems, iteration, condition, condition-controlled, repeat until, count-controlled, list, variable	Network, Hub, Server, Router, ISP, Protocol, Mainframe, personal, computer, stand-alone, HTTP, Wired, Wireless, 3G, 4G, 5G, WiFi, Bandwidth, Bit, megabit, Gigabit, Broadband, Buffering, Packet, IP, address, packet, header, packet, payload, Transmission, Control, Protocol, Internet, Protocol, World, Wide, Web, WWW, internet, services, Email, Voice, over, Internet, Protocol, (VoIP), Internet, of, Things, (IoT), Spam, privacy, Security, web, browser, web, server, web, page, search, engine
Assessment:	Knowledge check Topic test	Knowledge check Topic test	Knowledge check Topic test **Summative Assessment 1**	Knowledge check Topic test	Knowledge check Topic test	Knowledge check Topic test **Summative Assessment 2**
Key/Historical misconceptions in this unit:	Presentation of work and communication is done so as to appeal to the author rather than the audience. "My work is good because I like it." (Audience).	Formulas are like calculators and we have to enter the numbers in each calculation, (cell referencing). If we don't need data we should delete it.	Programming a computer is a difficult task that requires a certain way of thinking. Computer programs have to be created from new every time.	Using someone else's work is cheating. If I change the words that people have used I am not stealing their work.	Solving a big problem takes requires one big program. Computers are clever and that's why they are quicker at solving problems.	Wi-Fi means you are connected to the Internet. Your computer connects directly to the Internet.

Sequencing:	**We have chosen to sequence the year 7 curriculum like this because…** All three aspects of computing, (digital literacy, IT, computer science,) need to be covered in equal measure to ensure a common baseline that cannot be assured with previous education settings. These topics represent the fundamentals for the rest of the students' time at QEMS and need to be in place at an early age. There is a focus on considered use of technology right at the start of the year. We want students to recognise how to present themselves with confidence and compassion. There also needs to be an understanding of how computers know what to do and how we can use them to achieve tasks. The topic in the last term also serves as a bridge into next year revealing the complexities that lie beneath the surface of the black box we use.
Values	This scheme of work promotes the school values of Compassion, Curiosity and Courage by: *Compassion:* Students consider the evaluation of the work others take time to create. They understand that they may be in a similar position in the future and would like feedback to be constructive and thoughtful. Therefore, they should try to do the same themselves. They also consider that work should be credited and should ensure that referencing is completed appropriately. *Curiosity:* Students explore how computing affects the real world. They consider the application and impact technology has and use content throughout the lessons to explore this. *Courage:* Students need to be resilient. They understand that work is never straight-forward and that, to do well, they will need to attempt things many times. If they can develop these skills and abilities they will develop their independence and be able to solve problems on their own using the resources available to them.
National Curriculum plus:	**In addition to teaching the statutory elements of the national curriculum, we also include** Effective use of technology as a tool to aid learning. We consider how online tools can help us communicate and assist in our learning. We want students to be independent and open so that learning is never hindered. We focus on effective use of email and MS Teams to help students understand how technology can help throughout their lives.