Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	School systems, baseline tests, computational thinking, E-Safety, Laws and binary conversions	Bebras competition, logic gates, programming, representing bitmap images and revision escape room.	Data representation – sound, computer history, computer hardware, networking and network topologies.	Spreadsheets, data representation – text and bubble sort.	Website terminology, HTML, merge sort, programming functions, searching algorithms and image manipulation.	Encryption, revision and creative project.
Content	Logging into the school systems – computers, emails, Talaxy and gcsepod. Baseline Computing test and reading test. Laws – GDPR, CMA and Copyright. Decomposition and abstraction using flowcharts. Binary – why it's used and converting to denary.	Bebras competition assesses students ability with computational thinking. Programming will be with Python working with variables, lists and selection. Bitmap images and how they are stored on the computer. AND, OR and NOT gates explored.	Continuing to interleave data representation and recall the meaning behind binary we turn our attention to sound. Computer hardware looks at the internal components of a computer. Networking compares small home networks to more substantial hardware needs of a business network. Network topologies – star and mesh.	Students will learn a variety of formula and graphing techniques used to manipulate and analyse data. We will compare how ASCII and Unicode can be used to represent text on a computer. The students will then compare sorting algorithms by starting with the bubble sort.	The vector images will be created and manipulated using Python subroutines. The priority here being students understand why subroutines make this process more efficient. HTML will be pages, text, colours, images and hyperllinks. Searching algorithms are interleaved here comparing them for efficiency.	Creative project will be designing a logo, website, advertising and merchandise for a business. Variety of encryption methods explored including caesar cypher and pigpen. The revision is done via another escape room.
Rationale/ Linking	Students need to be able to use all the school systems in their every day school life. Binary is a topic that is needed to access much of the curriculum. Laws and e-safety have to be a priority in Computing. Computational thinking to prepare students for the November competition.	Bebras competition and escape room both build on from computational thinking lessons. Bitmap images is the most accessible data representation lesson setting groundwork for sound and vector images. It is important students get access to Python in this half term to be able to make a judgment for GCSE options.	Placed here as I want students to gain a real insight into the variety of topics covered at GCSE before making their options choices. Interleaving data representation threads through the year. Understanding how computers developed helps understand the importance of the following topics.	Understanding how text is stored is a necessary step to gaining a deeper understanding of encryption (covered in summer 2). Spreadsheet skills are needed for accessing many other subjects within the school both at KS3 and KS4.	Website terminology is partially E-safety but also to help students navigate computing news and computing in the wider world. HTML is beyond the scope of the NC but I feel is important to give students the technical skills needed in life.	The revision will prepare students for their final examination. The creative project is left until the end of the year so students can use the wide variety of skills learnt in a way which will support them whatever their options choices. It also gives them the skills needed to be more effective in the wider world.
Assessment	Baseline test at the start of the school year. This allows for lessons to be adapted if weaknesses or strengths are found. There are then 3 other data points throughout the year where students are accessed on all learning up until that point.			**Learning Resources**	https://www.bebras.uk/ https://idea.org.uk/ https://www.python.org/ https://www.gcsepod.com/ Flowol 4 https://www.photopea.com/ https://pixilart.com	

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Theory topics	1.1.1 Architecture of the CPU 1.1.2 CPU performance 1.2.3 Units of data 1.2.4 Data storage – converting between data types 2.1.1 Computational thinking 2.2.2 data types	1.1.3 embedded systems 1.2.1 primary storage 1.2.2 secondary storage 1.2.4 Data storage – sound, images and characters	1.3.1 network and topologies 1.6.1 Ethical, legal and cultural impacts of technology 2.5.1 languages	1.3.2 Wired and wireless network, protocols and layers	2.4.1 Boolean logic	Work experience, mock exam and exam technique. Any additional lessons will focus around building up programming skills.
Programming	Throughout the year a substantial number of lessons are focussed on, creating algorithms (2.1.2) programming fundamentals(2.2.1) and practical programming skills. This is using variables, constants, operators, inputs, outputs, assignment, sequence, selection, iteration, arithmetic operators and Boolean operators. Leading to using subroutines, defensive design (2.2.1) and testing (2.3.2). In the first point skills will be taught independently of each other, developed to multiple skills which they are told which and eventually taking that scaffold away to students choosing the skills needed for the problem.					
Content	Von Neuman architecture including how data moves around it. CPU speed and cores. Int, float, string and Boolean data types. Decomposition and abstraction.	Explore a range of embedded and general purpose systems. Options for primary and secondary storage to be able to compare them. Sound analogue to digital, stirring bitmap images and character sets.	Legal, ethical and cultural included current events in addition to general issues e.g. e-waste.			
Rationale/ Linking	Units of data and computational thinking are so integral to be access the rest of the curriculum, they have to come first. Computer Architecture is one of the most complex topics so plenty of time given for review.	Leads on well from just the CPU. Data representation has a base knowledge in KS3 to be used.	Students need to keep up with news implications for these areas for application of knowledge questions. This is a habit that needs building early on.			
Assessment	DC1 will focus on programming skills and the theory covered so far. Will mainly be short answer questions and multiple choice. DC2 will be answering exam style questions from a selection of topics covered so far. DC3 and the mock examinations will be partial exam papers. 45 minutes each for DC3 and 1 hour each for mock exams.			**Learning Resources**	Seneca learning, Craig n Dave, repl.it and GCSEPod. Some resources from Nichola Wilkin and CodeHS. Main coding resources are bespoke. Homework using GCSEpod.	

	THOMAS ALLEYNE'S HIGH SCHOOL UTTOXETER LEARNING TRUST	Curriculum Overview for: Computer Science		Key Stage 4 Academic Year Group: 11	
Term	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Topic	1.41. Threats to computer systems and networks 1.4.2 Identifying and preventing vulnerabilities 2.1.3 Searching and sorting algorithms	1.5.1. Operating systems 1.5.2 Utility software 1.2.5 compression	2.5.2 IDE SQL Exam technique	Exam practise and case select.	Review stage. Both exams in May: J277/01 - 15th J277/02 – 21st	Supporting revision for other subjects and starting 6th form induction work.
Programming	Additional programming techniques building on from programming fundamentals to including passing parameters, 2D arrays and SQL. Will continue with working through 2.3.1 defensive design and 2.3.2 testing.					
Content	Linear and binary searches. Merge, bubble and insertion sorts. Outlined attack and defence methods from the specification to include humans as the weak point of the system and considering both physical and logical defence methods.	Parts of the operating system, different types and uses of utility software and how compression works.	Focus on types of exam questions including making the most from level of response questions and accessing the maximum amount of marks from the programming questions.	Main focus will be on exam technique and introducing case select. Higher targets will spend a good amount of time working with higher order programming questions e.g. 2D array and file operations. Lower targets will focus in on getting all the input, output and data type questions right consistently.	Concluding revision to be ready for the exams. Last lessons will be booster sessions.	
Rationale/ Linking	Students were exposed to laws and the media around Computer Science in Year 10. This allows them to apply that knowledge to how they are being broken and how we can take steps to prevent it. This in itself builds from the E-Safety lessons at KS3. Higher target learners will be more capable of being able to program these at this point enabling them to recognise the code.	This builds upon the data representation introduced previously. Students will be able to access this better knowing how images, text and sound are stored.	Students will have been using IDEs throughout the two years of programming. However they will have only experienced IDLE and REPL.IT. They need a more thorough experience of IDEs to be able to discuss them during the exam. This will be achieved by asking them to code in notepad and then asking how the IDE helps.	Case select is left right until the very end so that only one selection statement is practised throughout the year. The exams haven't had much focus on case select before so had been better to focus on what more frequently appears but also give students some experience with the alternatives.	With content covered and the exam dates imminent this is a time to focus on student wellbeing and booster sessions.	
Assessment	All data captures will be partial exam papers until February when we move to full papers.			**Learning Resources**	Seneca learning, Craig n Dave, repl.it and GCSEPod. Some resources from Nichola Wilkin and CodeHS. Main coding resources are bespoke. Homework using GCSEpod and CGP 10 minute tests.	