Computing

Is anchored in our Christian Values

Our curriculum develops students' perseverance by exposing them to programming from very early on, encouraging them to overcome challenging tasks and building up their resilience and problem solving skills.

Is fully inclusive and celebrates diversity

Our curriculum gives all students the opportunity to experience foundational computer science topics from both theoretical and practical. Students are introduced to many aspects of Computer Science giving them a good view of the many branches of the subject.

Values all subjects, both core and creative, academic and vocational

Our curriculum offers vocational and academic pathways at KS4 through the conventional Computer Science GCSE and the vocational Cambridge National course(s).

Develops students' ability to be resilient, reflective, resourceful and responsible learners

With every unit students are introduced to new ways of completing problems - from the traditional pen & paper approach when working problems out, to different types of software all requiring their own methods and thought processes to complete tasks.
The core essence of Computer Science is problem solving, as such students are forced to be resilient, reflective, resourceful and responsible.

Provides pathways for academic success

Our curriculum provides an opportunity to achieve academic success through two different pathways: GCSE Computer Science and Cambridge National in IT

Prepares students beyond knowledge and skills to be successful in tomorrow's world

Computer Science lays the foundation of computational thinking for students, a skill synonymous with problem solving and logical thinking. Many students utilise this foundational knowledge to assist them in their further education whether it's within the field of Computer Science, Maths, Engineering, Physics or other related subjects.

- *We have a strong focus on programming and problem solving*
- *Students are challenged beyond the scope of the national curriculum*
- *Students engage in in-house programming competitions in order to further develop their key problem solving skills*

Year 7	Year 8	Year 9
Using the School Computers	Online Safety	Google Project
Small Basic	Python Advanced	
Hardware and Software	Algorithms	
Spreadsheets I	Codebreaking	Python Project
Python Intro	Spreadsheets II	
Binary & Logic Gates	Scratch	

Year 7

Unit 1: Using the School Computers

In our first unit at Chelsea Academy the students are introduced to our IT systems, and given their logins both for the school computers and to access our Google based services.

The students are introduced to Google Classroom, Gmail, Google Docs, Google Sheets and Google Slides and are encouraged to use their imagination in the tasks as they get familiar with the Google Suite for Education and how it is used at Chelsea Academy.

Unit 2: Programming with Small Basic

The students are then introduced to programming using a piece of (free) software called Small Basic. They are shown how to create shapes using the Turtle before moving onto text based programs such as a short 'choose your own adventure' story and a login system. Finally they bring their text and turtle programming together in their final task of the unit.

Unit 3: Hardware and Software

Moving onto the second term, the students are taught about the different pieces of hardware and software that make up a computer (and other computing devices). This unit incorporates both learning and research as the learners are encouraged to use the Internet to find out more.

At the end of the unit they will have the opportunity to put their knowledge to the test by using an online PC builder to find parts for a computer given a certain budget!

Unit 4: Spreadsheets I

Our first spreadsheet unit introduces the concept of formulas and manipulating big data. The students throughout the unit will pick up new tips and tricks and will get to showcase this at the end with a small project.

Unit 5: Intro to Python Programming

At GCSE our students have to learn Python as a programming language and so we thought why not bring it to KS3! The students will learn the basics of the language, concepts such as variables, assignment, data types, operators, output, input and selection.

Unit 6: Binary & Logic Gates

Another unit that we have brought down from the GCSE specification is the idea of binary and logic gates. Computers work using a lot of on and off switches (that we represent as 1's and 0's) and can do amazing things with just this! In this unit we learn how to convert between our numbering system to binary and vice versa. We also look at the fundamental component of the computer - the transistor in the form of a logic gate, and how they work abstractly.

Year 8

Unit 1: Online Safety

In the world of social media and being able to connect to anyone in the world instantly, there is a lot of good - there are also a lot of dangers. In this unit students will look at some of these dangers and be better equipped to protect themselves as they venture into this vast online space.

Unit 2: Advanced Python Programming

Building upon what we learned in year 7, the students will further explore selection with if statements along with being introduced to iteration (for and while loops). The stronger amongst the cohort will be taught subroutines and will bring everything they've learned together to complete the assessment tasks!

Unit 3: Algorithms

Yet another unit hijacked from the GCSE specifications! We look at algorithms and the importance they play in both our daily lives and within computers. Students are taught to look at the world *algorithmically* and are shown five common computing algorithms - merge sort, insertion sort, bubble sort, linear search and binary search.

Unit 4: Codebreaking

Taking a *break* from trying to act like a computer, the students will now focus their energy on trying to act like a computer. In this unit they will be introduced to some of the basic ciphers and will use this information to create their own ciphertext and to decipher other students' secret messages!

Unit 5: Spreadsheets II

Returning back to spreadsheets the students will build upon what they've learned in Year 7 and learn about more powerful tools such as VLOOKUP and pivot tables.

Unit 6: Visual Programming with Scratch

Finishing off year 8 the students will return to the familiar (assuming they were introduced to Scratch at primary school!) but this time will be going much deeper. I won't sugarcoat it, they're going to be making games but each week the games become more complex and they will have to use harder programming constructs to get things to work.

Year 9

Unit 1: Google Project

Using Google Docs, Sheets, Slides and Forms, the students will be assigned a project to complete over the course of the unit.

Unit 2: Python Project

After learning about Python in both year 7 and 8, the students will now be putting all their skills to the test in one final project before they move to KS4!