	Component 1	Component 2	Component 3
10	**Component 01: Computer systems** Introduces students to the central processing unit (CPU), computer memory and storage, data representation, wired and wireless networks, network topologies, system security and system software. It also looks at ethical, legal, cultural and environmental concerns associated with computer science.	**Component 02: Computational thinking, algorithms and programming** Students apply knowledge and understanding gained in component 01. They develop skills and understanding in computational thinking: algorithms, programming techniques, producing robust programs, computational logic and translators.	**Practical programming** Students are to be given the opportunity to undertake a programming task(s) during their course of study which allows them to develop their skills to design, write, test and refine programs using a high-level programming language. Students will be assessed on these skills during the written examinations, in particular component 02.
11	**Component 01: Computer systems** In year 11, all of the Component one topics taught in year 10 are revisited before going in to further detail. Students are introduced to network protocols, virtual networks, the fetch, decode, execute cycle and the legislation that surrounds the legal concerns associated with Computer Science.	**Component 02: Computational thinking, algorithms and programming** In year 11, all of the Component two topics taught in year 10 are revisited before going in to further detail. Students are introduced to the practical coding of defensive design techniques as well as searching and sorting algorithms.	**Practical programming** Students will apply the skills they've learnt in year 10 to complete an informally assessed programming project. They will also learn more advanced programming techniques such as functions, classes, file handling and 2D arrays.

12	**Paper 1** In this unit, students are taught the theoretical knowledge of data structures, systematic problem solving, and the theory of computation. The unit assesses a student's programming ability, Students answer a series of short questions and write / adapt / extend programs in an electronic answer document.	**Paper 2** Students are introduced to the fundamentals of data representation, computer systems (hardware and software), computer architecture and organisation, communications and networking, and the consequences of using computing.	**Practical programming** Students will continue to develop the programming skills acquired at GCSE level including iteration, selection, functions, arrays and file handling. At AS level they will learn more advanced programming techniques such as OOP, modules and exception handling. Students will use these skills to complete programming tasks.
13	**Paper 1** In year 13, all of the Component one topics taught in year 12 are revisited before going in to further detail. Students are introduced to advanced OOP concepts, functional programming paradigms, hashing, vectors and sorting algorithms. Maths for regular expressions, big-O notation and the halting program is also covered.	**Paper 2** In year 13, all of the Component one topics taught in year 12 are revisited before going in to further detail. Students are introduced to the floating point number system, NAT, DHCP and databases, including the use of SQL to create, edit and search databases.	**Practical programming - NEA** Students will apply the skills they've developed in year 12 to complete their NEA programming project. This course work unit assesses student's ability to use the knowledge and skills gained through the course to solve or investigate a practical problem.

Studying Computer Science at Pimlico Academy provides students with a solid foundation in the underlying principles of computing. Students learn how algorithms and computer code are written, how data is stored, how data is transmitted around networks, and how hardware and software function. The Computer Science curriculum provides a deeper understanding that goes beyond the actual technology. For example, students learn how to use computation to solve problems and how the increased use of technology affects mental health and the environment.

Our curriculum at Pimlico Academy aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- are responsible, competent, confident and creative users of technology.

The Computer Science curriculum is split into two main areas which run simultaneously and complement each other in their delivery. Namely, these are 'Computer Systems' and 'Algorithms and Programming'. At the start of the GCSE course, students learn how the different components of a computer system work together and how data is processed. This is a crucial starting point in developing a deeper understanding of how a computer works. Concurrently, students learn the basics of programming. This includes the theory behind the different programming constructs and how computers translate programming languages. This falls within the wider theme of data representation and students quickly become familiar with the idea that all digital information is represented by binary data.

By the end of the GCSE course, students are proficient programmers who are able to create efficient solutions to complex programming problems. Students are not only able to describe how a computer processes data, but how multiple computers and devices connect through networks and the internet. Furthermore, students are aware of both the power and the limitations of technology and the importance of creating technology that has a moral responsibility. This awareness and understanding provides students with the skillset required to study the subject at A Level. At A Level students study computer components and processing in greater detail, and use their programming expertise to produce a real world programming project. By the end of KS5, students are ready for the world of work or for studying the subject at degree level.

Computer Science forms an essential part of our curriculum and the scope and opportunities for students in this field are ever increasing. There are opportunities for students of all abilities within the subject whether creative or technical, whether Maths or Science or the meta-skills of problem solving and logical thinking. Computer Science encourages independent learning, team work and collaboration, enhances mathematical thinking and problem solving skills. Above all it is an enjoyable, challenging and increasingly crucial subject.