



## Computing: Year 8 Overview

### **Block 1: Computer Systems**

Students are reminded of the input/output process storage memory model. They are asked the difference between hardware and software. The key topics of the model are covered and students recall what input and output devices are. They discuss memory (RAM/ROM) and what is stored in them. Different storage topics are also discussed, alongside the advantages and disadvantages of these methods. They also discuss the CPU and what affects CPU performance. They begin to answer exam style questions on these topics which builds towards assessment. **Binary Maths:** Students begin to cover binary, why we need it and then begin converting binary to decimal, decimal to binary, adding binary numbers together, explaining the concept of binary overflow and how computers store data in binary and data units.

### **Block 2: Python Programming**

Students are asked 'what is programming and why and when learning languages syntax is important'. Students are shown the python programming language and the interface. They are introduced to programming flow sequence, and the usage of variables. They are shown how to use numbers and text strings. Selection and IF statements are then introduced as a second programming flow. They are finally introduced to loops (iteration) Boolean operators (AND, OR), lists (Arrays). They are then encouraged to create their own python projects where they will work independently on a project from start to finish. Student are assessed at the end of the block.

### **Block 3: Computational Thinking**

Students are introduced to a more advanced unit on computational thinking. Topics like pattern recognition, decomposition and abstraction are introduced as are logic gates, algorithms in flow charts and algorithms in pseudocode. Students are encouraged to find problems in algorithms, debug those problems and ensure the algorithm gives the correct outcome. Students are assessed at the end of the block 3 which again builds towards final assessment levels.

### **Block 4: Networks**

The network topic is introduced by starting with the most familiar network, the internet. Students are shown how the internet works and that the WWW is not the internet. Some network protocols and rules are introduced, as is the topic of IP addresses and how files are sent from one side of the world to the other using packet switching. Different wiring is

covered when we talk about connectivity media and network speeds. We then look at the idea of traditional local area networking and wide area networking and the purpose of networks in business and the evolution of network topologies.

Students will also be able to design a network and how they might set up a school or office network. We then also cover the topics network and cyber security which covers hacking and social engineering, phishing emails and how to avoid malware and spyware. Finally, we cover the necessity of encryption when transferring data over a network.