| | What will I learn? | How will I learn it? | Why is it important that I learn this? | Why am I learning this now? |
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| OCR GCSE (9–1) in Computer Science (J277) Year 10 | | | | |
| J277/02: Computational thinking, algorithms and Programming | You will look at Boolean logic and how circuits can be combined to produce the desired output. You will study programming fundamentals such as the use of variables, constants, Boolean operators, inputs and outputs. | By using online simulations that demonstrate the way the logic gates function. Through a variety of practical classroom-based activities you will see how computers use data. | You will plan and carry out investigations into circuit design. Data manipulation is the basis of all computer based problem solving. | Computers are built using logic gates and understanding how these functions will allow you to write better programs. By storing and manipulating data a program can carry out complex instructions. This is a vital skill for the programming project. |
| | You will learn what an algorithm is. Why it is important and how to construct a working algorithm. | Through a variety of practical programming activities. | All computer programs are based on solid algorithms. | You will use the skills in this unit to write effective and efficient code. |
| | You will learn techniques in producing robust programs by using skills such as authentication, validation and naming conventions. | Through a variety of practical programming activities both in class and online. | Users can be unpredictable. You will learn how to build programs to deal with errors. | When writing code it is important to build in a level of error handling in order for the program to not continually fail. |
| | You will study different Programming languages and Integrated Development Environments using high-level and low-level languages. | You will look at different programming languages that a computer can use such as machine code and assembly language. | You will see how computers use binary to carry out complex tasks. | Understanding how to use the tools of an IDE is a big step in becoming a programmer. |
| J277/01: Computer systems | You will learn about the modern computer systems architecture. This includes the CPU and its registers, embedded systems and the fetch-decode- execute cycle. | Through practical based work using a simulator of the CPU you will explore how registers are used. | To understand how a modern CPU carries out its functions in a consistent way | This unit will build on your knowledge of computer components from KS2 and introduce you to new more detailed concepts. |

| J277/01: Computer systems | You will look at how computer use primary and secondary storage and how memory is used by computers. | Through Enquiry and simulator- based work using the Little Man Computer. | To understand the importance of different types of memory. | You will learn how memory is used by a computer system to store information and how it is retrieved. |
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| | You will learn how computer networks are built through different connection methods and protocols. | Through practical and theory-based study. Both simulations and hands on builds. | To understand the many different ways computers can be connected. | This unit will build on your knowledge of computer networks from KS2 and introduce you to new concepts. |
| | You will learn about network security both physical and software based. | Through a variety of practical activities online. What is hacking? | To understand the importance of keeping data secure. | This unit will develop your skills as a programmer. |
| | You will look at systems software currently in use on computers to make operation more user-friendly and robust. | Computer systems use system software but many of the functions are hidden from us. | To appreciate the functions of an operating system and how they are carried out. | You will learn how programs work together to produce a system. By deconstructing a problem, it is easier to solve it. |
| | You will study Ethical, legal, cultural and environmental impacts of digital technology in the modern world. | Modern systems use the planets resources. You will investigate the impact it is having on the world. | To see the impact even small devices, have on the global environment. | In order to fix the problem of pollution we need to understand how it has come about in the modern world. Use of rare metals in computers. |