

## Computer Science

Computer Science at Key Stage 3 aims to ensure that all pupils understand and apply fundamental principles and concepts of computing, including abstraction, logic, algorithms and data representation. Pupils will be able to analyse and problem solve in computational terms; creating computer programs using Scratch and Python. They will also understand and apply information technology using new or unfamiliar technologies providing suitable skills for future workplace or further education. All pupils' work will be completed via Google classroom and saved on their individual Google drives which are available online at all times.

### Year 7

In Year 7, pupils will learn digital literacy so they can apply successfully proficient use of Microsoft products.

Pupils will understand how to stay safe online, including what is personal data, online bullying and how to report issues.

They will begin to investigate basic programming, understanding sequencing, problem solving and processes of development such as flowcharts and pseudo code using Lightbot and Kodu. Moreover, they will begin simple programming in Java and Python using Microbits, structuring simple instructions to perform tasks.

Pupils will investigate how computers work and what components are inside a computer including an introduction to binary.

### Year 8

In Year 8, pupils will learn about the world of digital gaming. This is a practical based unit, which will enhance their coding abilities and problem solving skills for the application of computer game design.

They will understand about computer systems and how they are used in real life environments. Also, the differences between operating systems and application software. They will begin to understand about networking and topology.

Pupils will also begin to develop further in programming using Python language, which will build on their existing skills, learned during year 7.

Pupils will develop their understanding of binary logic looking at converting binary to denary and using simple logic gates with truth tables.

Finally, pupils will plan, develop, build and test a website, which will include some HTML code and understanding of CSS using Dreamweaver.

### Year 9

In Year 9, pupils will produce a game which uses a range of different interactive media, building on skills previously gained in Years 7 and 8. This will involve sticking to a specific brief and building a game engine. There will then be a testing phase and evaluation of their own work to critically analyse and improve on their own work.

Pupils will then continue to build on their Python programming skills and further develop their software development skills. This will include learning about such terms as syntax, variables, while loops, 'if' and 'else-if' statements and how to test and improve code that has been written.

They will further develop understanding of binary logic and data representation. How computers use binary to represent sounds, images into machine code

Finally, pupils will learn how networks work and how the worldwide web works and the legal and ethical risks of using the World Wide Web. This will involve looking at security, internet protocols, service providers and ethical issues of the internet.

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### Extra-Curricular

The Dean Trust has a strong partnership with UKFAST and uses this partnership to organise trips and workshops to enhance pupils' understanding and skills, and to expose them to potential careers within the computer science industry.