

# Computing Curriculum

## Purpose of study

Our curriculum aims for every student to become a wise, astute, discerning consumer of IT products in world increasingly permeated by the pressures of social media. We offer students the opportunity to acquire programming and Business Intelligence skills (which are highly transferrable and increasingly lucrative) to give them opportunities they have may not have previously considered and give them ambitions they may have considered beyond their horizons.

We cover all elements of the Program of Study and are introducing a second programming language JavaScript to give the students more scope in the employment sector. We have deliberately chosen a language which though traditionally used for front end scripting can be used server side (back end) to increase the scope of projects they can build. One of the schools aims is Resilience and the habits underpinning this are well embedded in students. This is clearly evident when students are coding or undertaking external challenges such as Bebras. JavaScript being a web-orientated language dovetails neatly with HTML which students and teachers are well versed in. It doesn't require software installation and gives students the opportunity to code interactive websites.

Year 7	Year 8	Year 9
7.1 Impact of technology	8.1 JavaScript	9.1 Computational Thinking
7.2 Understanding Computers	8.2 Javascript	9.2 Introduction to Python
7.3 Digital Citizenships	8.3 Binary Bits & Bobs	9.3 Python
7.4 Spreadsheets	8.4 Data Representation	9.4 Cybersecurity
7.5 HTML	8.5 Back to the future	9.5 Network
7.6 HTML/CSS	8.6 Social Media	9.6 Networks

Our curriculum is based on satisfying the needs of all students who need to become adept and informed users of IT and those students who are interested in working in IT whether that be programming for a software house or building software for business.

Teachers start their lessons by highlighting and get students to repeat key words to be used in the lesson. I also like to look at the etymology of words and use key moments of the lesson to provide a historical context where appropriate to the words under discussion. For example, when describing the effects of a Trojan Horse I will relate this to being aware of Greeks bearing gifts!

**Our curriculum is evolving continually to take account of technological change and the demands of the workplace. It is increasingly less outcome focussed and more relevant to students' wider experiences. As well as teaching programming as discrete topics we intend to change our pedagogy so that pseudocode and coding problems are revisited at the end of each lesson.**

Our Computing curriculum is aligned with the school curriculum principles:

**Entitlement-** Students will feel empowered to become Computer Scientists or Digital Media creators of the future, and whether they take their studies further or not, they will all know how to participate meaningfully and safely online and take a full, effective part in our digital society.

**Coherence-** Taking the National Curriculum at Key Stage 3, Computing & Business is carefully sequenced to embed an understanding of range of computer systems, computational thinking and programming skills to enable them to have a positive approach to a real world problems. They will build transferable skills, including the ability to program in various languages and use of a wide range of hardware and software and devices, allowing students to become effective programmers.

**Mastery** -At KS3, students will enjoy stretching themselves with programming challenges. We use a range of software design techniques such as flowcharts, pseudocode. In Year 9, students will be able to make informed decisions on appropriate and efficient coding techniques such as sequence, selection, iteration and use of functions. Students will create and publish websites, analyse data and present it visually with spreadsheets, and produce professional artwork with photo-editing software.

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A Mastery approach means that all topics build on prior learning and students remain secure in what they have previously learned as they progress.

**Adaptability-** The curriculum has been modelled to allow all pupils, including SEND and EAL students to achieve high quality outcomes and experience a wide range of skills and processes. Appropriate support and adjustments are embedded where necessary, including multiple means of participation and assessment, alternative work where appropriate, accessibility features and trained key worker support.

**Representation** - All pupils see themselves in our curriculum, and our curriculum takes all pupils beyond their immediate experience. We provide opportunities which allow students to develop a knowledge of a range of ICT, Digital Literacy and Computing in KS3 including; ICT (how digital systems work), Digital Literacy (using digital systems and apps) and Computing (creating digital systems and apps). Students will grow in confidence through dedicated teaching environments, the latest ICT equipment and software, and specialist teaching.

**Education with Character** - All students can attend extra-curricular clubs to expand their programming skill and encourage students to contribute to the life of the school and the community, by working with real contexts to develop their skill and knowledge in the Computing.

## Why This, Why Now?

We have made most of the curriculum available for learning online and are working on making the teaching of coding available online as well. The ability to code is a rare and in demand. We aim to give students the ability to code effectively enough to gain entry level positions which can lead to university and apprenticeships. We want to encourage independent online learning backed up by teacher feedback and encouragement.

We are keenly aware of the demographic and the internal dynamics of the community we serve (and are part of). We recognise our students as individuals and our management have made information pertinent to their learning readily available and contextualised to their up to date specific circumstances.

We actively seek the opinions of our students and encourage their ambitions. We are keenly aware that students are motivated to improve their life chances and motivated to help them direct their efforts.

In Year 7, students understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems. Year 7 focuses on creating a better understanding of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy. Students conclude the year by learning how the Internet works and how to make websites using a mixture of HTML and CSS.

In Year 8, students start by learning JavaScript which provides teachers the opportunity to recap HTML and CSS. Students are then introduced to how numbers can be represented in binary, learn to carry out simple operations on binary numbers, for example, binary additions and conversion between binary, hexadecimal and denary. Students learn how binary numbers represent different types of data such as images and sound. They learn about compression techniques and encryption before learning about the key personalities who played a key role in developing these technologies. It is vital that students learn about social media, and we are keen that students develop their oracy skills. We are trialling a new way to deliver content that students can interact with more independently which will take the form of guided research to produce an essay entitled "Should Social Media be banned for teenagers?"

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In Year 9, pupils build on previous knowledge, and learn how to design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical system. They then apply their understanding of the algorithms whilst learning programming in Python to solve a variety of computational problems. Students also learn about the threats to computer systems and how to design a computer network according to client's needs.

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