

Computing Departmental Curriculum Statement

Curriculum Intent Statement

The aim of the Computing curriculum is to provide an opportunity to study aspects of all three Computing sectors: Computer Science, Creative Media and Information Technology. Computing at Cowley is compulsory for all students at both KS3 and KS4; this to ensure that the statutory National Curriculum requirements are fully and robustly met. With Computing related employment currently one of the fastest growing current occupations and with an anticipated ten million British jobs to be taken over by computers and robots over the next 20 years, this approach ensures that a wide range of progression opportunities within Computing are made available to all Cowley students irrespective of ability or SEND status.

A practical, problem-solving approach ensures that all Computing courses are both challenging and exciting and that students are prepared for the world of work. This links to the wider STEM strategy designed to accumulate students' cultural capital and to help empower future generations through science, technology, engineering and mathematics and to grow a dynamic, innovative economy. All Computing courses encourage the development of transferable skills and include opportunities for all students to progress to a wide range of higher education courses and ultimately to employment within one of the many Computing sectors.

Computing courses differentiate by outcome so that resources, approaches and outcomes are open to all students of all abilities. All Computing courses are delivered and brought to life by a specialist and experienced team of dedicated staff. Many of the team also have industrial experience within the Computing sector. The team of specialist, enthusiast staff ensure that high expectations are set and that Cowleian values are embedded throughout.

The mandatory and optional content of both Level 1/2 and Level 3 courses provides a balance of breadth and depth, while retaining a degree of choice for individual students to tailor content relevant to their own interests and progression choices.

Curriculum Implementation Statement

Statutory Requirements Key Stage 3 National Curriculum

A high-quality computing education equips students to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which students are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, Students are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that students become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Students study KS3 Computing in Years 7-9, which covers all aspects of the National Curriculum. Students are taught the principles of computer science, information technology and creative computing. There is a strong emphasis on 'Remembering More and Knowing More' with varied questioning, problem solving and formal interim and end of units tests to check retention and understanding of curriculum content. The KS3 course is designed to be challenging and exciting; students learn how to design, use and evaluate computational abstractions, understand key algorithms that reflect computational thinking and use logical reasoning to compare alternative algorithms for the same problems. Students use a range of both text and non-text based programming languages, designing and developing modular programs to solve a variety of computational problems. Students understand simple logic and some of its uses in circuits and programming; understand how numbers can be represented in binary and to how to carry out operations on binary numbers. Students understand the hardware and software components that make up computer systems, how they communicate and how instructions are stored and executed. Students understand how data of various types can be represented and manipulated digitally and undertake creative projects that involve selecting, using, and combining multiple applications, across a range of devices, to achieve challenging goals. Students create,

re-use, revise and re-purpose digital artefacts, with attention to trustworthiness, design and usability. Students learn to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct and know how to report concerns.

Statutory Requirements Key Stage 4 National Curriculum

All students must have the opportunity to study aspects of information technology and computer science at sufficient depth to allow them to progress to higher levels of study or to a professional career. All students should be taught to:

- *develop their capability, creativity and knowledge in **computer science, digital media and information technology***
- *develop and apply their analytic, problem-solving, design, and computational thinking skills*
- *understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns*

In years 10 and 11, Cowley covers the statutory requirement for computing by ensuring that all students study BTEC Tech Award Digital Information Technology with the option of also studying GCSE Computer Science. By doing so, students open-up clear progressions routes to Computing qualifications at L3 which allow them to progress to higher levels of study or to a professional career within Computing. The Computing curriculum ensures that there is no gender gap in terms of qualification uptake at KS4, is inclusive of all vulnerable groups, and contributes to the low NEET statistics at the college.

Tech Awards are the new, robust Key Stage 4 qualifications designed to be taught alongside GCSEs, providing sufficient depth to allow students to progress to higher levels of study or to a professional career. Like GCSEs they have a high percentage of externally assessed content. In addition students would be given the option to study GCSE Computer Science; a qualification which provides students with further opportunities to apply their analytic, problem-solving, design, and computational thinking skills.

Assessment in Years 10 and 11:

- Level 2 BTEC Digital Information Technology in Year 10-11 have 60% of their work internally assessed and 40% externally assessed.
- GCSE Computer Science is 100% externally assessed through 2 examinations. The GCSE assessment method for Computer Science allows students to achieve grades 9-1.

Post 16

In Years 12 and 13, students opt to study either L3 BTEC National Creative Media Game Development or L3 BTEC National Information Technology.

From September 2020, students have also been able to opt to study L3 BTEC RQF National in Computing and L3 BTEC RQF National in Creative Digital Media Computing. Current Level 3 Computing qualifications are 100% internally assessed but, from September 2020, most qualifications will have externally examined components. All Level 3 BTEC National courses attract UCAS points.

Teaching and Learning

A variety of teaching and learning strategies are used in order to provide pace and challenge to lessons and to engage students including maintaining a healthy mix of academic and practical content. There are clear teaching and assessment phases during each Key Stages. All courses provide students with the opportunity to develop high level literacy skills through research, report writing and planning, analysis and evaluation; also to develop high level numeracy skills through non-denary numbering systems, text based programming, arithmetical and logical operators, formulae and functions. Time management skills are essential as students will have regular deadlines to meet as well controlled timed assessments. Throughout all courses, students will be expected to complete work outside of lessons, through designated homework tasks. Students will also be encouraged to keep up-to-date with the latest developments within Computing and share their knowledge in lessons.

Curriculum Beyond the Classroom

Students are always welcome to use the specialist rooms and resources for independent study. All work is set and delivered through Microsoft Teams which allows students to continue to work independently from home, access resources, submit work and receive regular feedback from staff and facilitate regular testing to support 'Knowing More and Remembering More'. Local experts are used wherever possible along with trips and relevant work experience. Currently, links have been established with Arcade Club, Bury.

Subject Expertise

The department comprises highly experienced, Computing specialists. The members of the team have experience of teaching the subject across a range of computing courses including GCSE Computer Science, GCSE IT, BTEC First ICT, Tech Awards in both Creative Media and Digital Information Technology, BTEC Nationals. All Computing staff hold the Computer Science Accelerator qualification, a professionally recognised training certificate, awarded by BCS, The Chartered Institute for IT, which qualifies staff to teach GCSE 9-1 Computer Science.

A large range of specialist hardware and software resources which allow students to access the latest technologies. The Head of Department, Mr R Jones is an ex-AST for Computing and is a CAS Master Teacher providing support and CPD to other schools in the Borough and to Computing ITT students through Manchester, Chester and Edge Hill Universities.

Destinations

Students are made aware of the progression routes available including working within IT and Creative Media sectors. As the department are also experienced or key members of the Sixth Form pastoral team, the subject, as a higher education choice, is regularly flagged up with students. Staff regularly receive the latest information about new courses, work experience and employment opportunities which are passed on to students as potential progression routes. Help will be offered to students with application processes as required. Having studied Computing and Game Development courses, students have progressed onto a wide range of apprenticeships, computing related professions and higher education courses at Russell Group universities linked to computing, software development, creative design, engineering and other STEM related areas.