# Computing department curriculum intent

## Department curriculum intent:

### Our Vision: we are aiming to make sure that all students:
♣ Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
♣ Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
♣ Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
♣ Are responsible, competent, confident and creative users of information and communication technology.

It is the aim of the department to enable students to develop skills and knowledge in computer science and digital technologies to prepare them for a future in a world where the use of this technology is fully embodied.   We wish to enthuse students to have an understanding far deeper than the interface that they currently operate, particularly in our current climate where computing skill and understanding has become even more crucial.

We aim to enable students to develop a love of learning for the subject and an understanding that there are no limits to their own development in programming and IT.  An important life skill for anyone is to problem solve.  Using the strands of computational thinking will aid learners with their Computer Science studies and, as it is embedded within everyday life activities, they will understand that they cannot run before they can walk.   Students will be given guidance on how to work safely online so that it will be second nature to carry out all the necessary steps for their own safety as well as those around them.

At KS3, students are given the opportunity to develop their computer coding and digital technology skills.  Learning the language of code is an important added bonus as students who develop their coding skills will be able to grasp the magic behind the computers.  This will allow them to take their studies onto KS4 and to Further and Higher education if they desire and ultimately secure a career within a large range of industries.  Our KS3 Computing curriculum covers the full range specified by the DFE and prepares our KS3 students for GCSE by including challenging tasks or topics found in the next level of education, such as quick sort, recursion and big O notation, which is more often seen at GCSE and A level.  Additional aspects, such as Machine learning, allow students to have a deeper understanding of how the digital world works around them.  Covering aspects such as looking for the cables that connect their computers to the server in school, looking out for the 3G/4G mast in their area and comparing rural vs urban data transfer speeds forges a connection to their local environment.

At KS4, we offer 2 pathways, GCSE Computing and Cambridge technical in Creative imedia, thus catering for the 'Programmers' and the 'creatives'.  In the past, we have drawn inspiration from their local area via their Controlled assessment briefs, for example, the photography unit for the summer exam series 2020, we had planned for and were ready to photograph Settle town architecture and had liaised with local businesses to identify potential issue areas.  A previous website unit had students looking for activities in their local area to encourage teens to rediscover their local area.

At KS5, Cambridge Technical in IT, students can, and do, draw from experience in both GCSE Computing and Creative imedia to develop an in depth understanding of Computing fundamentals and Global data.  They undertake three creative projects, including the opportunity to program via the games unit, thus allowing them to undertake a variety of career pathways in the IT industry.

# Curriculum mapping

| | | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|---|
| **Year 7** | **Overall curriculum intent for year 7:** To become confident in the use of Settle College's online network and productivity tools (365, Teams and Arbor), to be aware of online risks and how to counter them and to develop and apply skills in various software to create digital products (Web page, video, scratch). | | | | | | |
| | Intent for the topic | Know my way around the school's network and learning platforms Apply knowledge to use them appropriately | | Understand how to keep yourself safe online and be a responsible Internet user Develop skill in specialist software | | To know what an algorithm is and write them using pseudocode and flowcharts Learn programming constructs and apply them to develop a game Develop skills in trouble shooting and debugging. Develop basic skills in spreadsheets | |
| | Content mapping | One drive, email, Word and Teams chat, assignments and meetings | PowerPoint and online collaboration Developing keyboard proficiency iDEA | Packet switching, internet risks (personal), video creation, internet risks and prevention to devices and data, | HTML and CSS web authoring | Flowcharts and pseudocode, program analysis, programming constructs, game development on Scratch  Spreadsheet data logging, formulas and data analysis | |
| | Key skills developed | Select, use and combine software on a range of digital devices to create digital products, that accomplish given goals, including collecting, analysing, Evaluating and presenting data Use search technologies effectively, being discerning in evaluating digital content | | Use technology safely, respectfully and responsibly | Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems | Apply the fundamental principles and concepts of computer science, including abstraction, sequence, selection and repetition, logic & algorithms Design, write and debug programs that accomplish specific goals Use logical reasoning to find and correct errors in algorithms and programs.  Apply understanding to enter, manipulate, calculate and analyse data | |

| | | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|---|
| **Year 8** | Intent for the topic | Develop understanding in how computers and networks work | Understand Binary representation of images Develop graphic editing skills | Project development process (imedia) | Understand how Machine learning and big data shapes our digital world | Project development process | Website creation using a WYSIWYG editor |
| | Content mapping | Input output, computer components, binary, networks, operating systems, H&S | Explain how a device (PC) stores reads and displays binary images. To explain how computers can represent bitmap image. graphic editing skills (layers, tools, workflow). Analysis of existing magazine covers, research assets for the magazine, design (visualisation) and creation (photoshop), image properties HL | | What is it? Benefits, programming an AI, moral compass | Existing website research, website design (sitemaps and wireframing), source website assets, masterpage set up and folder structure creation, website creation (linking, testing and content editing), evaluation | |
| | Key skills developed | Apply the fundamental principles and concepts of computer science: use search technologies effectively, be discerning in evaluating digital content. | Apply the fundamental principles and concepts of computer science: select, use and combine software on a range of digital devices to create digital products, that accomplish given goals, including collecting, analysing, evaluating and presenting data. | | Apply the fundamental principles and concepts of computer science, including abstraction, sequence, selection and repetition, logic & algorithms. Design, write and debug programs that accomplish specific goals. Use logical reasoning to find and correct errors in algorithms and programs. | Develop skills in planning and creating a digital product: use technology safely, respectfully and responsibly. Select, use and combine software on a range of digital devices to create digital products, that accomplish given goals, including collecting, analyzing, evaluating and presenting data. Use search technologies effectively, be discerning in evaluating digital content. | |

**Overall curriculum intent for year 8:** Develop understanding in how computers and networks work.  Know how binary is used to represent numbers, text and images.  Develop skills in key specialist software, used in GCSE.  Further develop understanding and use of programming constructs via the use of Python.

**Overall curriculum intent for year 9:** To build on students' prior knowledge and skills and provide a feel for both GCSE options to enable effective decision making at GCSE.

| | | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|---|
| **Year 9** | Intent for the topic | Develop and create a Game in game maker | Develop skill and understanding of programming constructs using a text-based programming language | Develop and use databases | | Understand several key algorithms used in today's systems e.g. searching and sorting | Develop a more in depth understanding of how computers work, especially the CPU. |
| | Content mapping | Game analysis, sprites and objects. Object orientated programming, programming constructs, testing and assessment. | Output text and calculations, functions escapes, casting, comments, sequence, selection, loops, data structures, external file handling. | What are databases, how are they structured? Forms, Queries and reports Relational databases. | | Searches, sorts, pseudocode and flowcharts, algorithm efficiency | CPU, fetch decode execute, transistors, logic gates & circuits, software, network hardware and protocols, encryption, cyber security |
| | Key skills developed | Apply the fundamental principles and concepts of computer science, including abstraction, sequence, selection and repetition, logic & algorithms. Design, write and debug programs that accomplish specific goals. Use logical reasoning to find and correct errors in algorithms and programs. | Apply the fundamental principles and concepts of computer science, including abstraction, sequence, selection and repetition, logic & algorithms. Design, write and debug programs that accomplish specific goals. Use logical reasoning to find and correct errors in algorithms and programs. Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems | Use, interrogate and edit data in database software to accomplish given goals, including collecting, searching for, and presenting data | | Solve problems by breaking them down into smaller parts. Apply the fundamental principles and concepts of computer science, including abstraction, sequence, selection and repetition, logic, algorithms and data representation. Design, write and debug programs that accomplish specific goals. Use logical reasoning to explain how some simple algorithms work. To find and correct errors in algorithms and programs. | Apply the fundamental principles and concepts of computer science: use technology safely, respectfully and responsibly |

| | | Year 10 | Year 11 |
|---|---|---|---|
| **Year 10 & 11 Core computing (all students)** | **Overall curriculum intent for year 10 & 11:** To provide all students with the IT and computing skills needed for the school education and the world of work in later life. This is covered as a six-week block of lessons as part of the | | |
| | Intent for the topic | To develop IT skills | To build up their Digital literacy and Computing |
| | Content mapping | Forms, spreadsheets and effective use of office software (word processing and presentation). Understanding and troubleshooting internet connectivity. | Threats, software systems, algorithmic thinking, Programming constructs, file handling, data structures, SQL, verification, validation, testing, networks, AI, Digital literacy |
| | Key skills developed | Microsoft Word: effectively structure, format, and edit documents for professional and academic purposes. Microsoft PowerPoint: designing visually engaging and informative presentations to convey complex ideas succinctly. Microsoft Forms: Develop the ability to create and analyse surveys and quizzes for data collection and assessment purposes. Acquire expertise in diagnosing and resolving network connectivity issues by understanding barriers to connectivity and how to improve them. | Apply the fundamental principles and concepts of computer science. Use search technologies effectively, be discerning in evaluating digital content. |

**Overall curriculum intent for year 12:** Students will gain the right combination of knowledge, understanding and skills required for the 21st century, enabling them to demonstrate the skills of writing specifications, and the design, build, testing and implementation of applications.  They will develop a solid foundation in the fundamentals of hardware, networks, software, the ethical use of computers and how businesses use IT.  Students will have a greater understanding of how organisations use information sources both internally and externally and the types of information they will encounter. The skills gained by completing this qualification will give them knowledge of the functionality of information and how data is stored and processed by organisations. They will also learn about how individuals use information of various types.

| | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 | Half term 6 |
|---|---|---|---|---|---|---|
| **Year 12** Intent for the topic | Induction Prepare for Unit 1 exam | Prepare for Unit 1 exam | Learn phases of development lifecycle Application development models | App research | Prepare for resit if needed App research and requirements | App creation |
| Content mapping | 1.Understand computer hardware 2.Understand computer software 3.Understand business IT systems | 4. Understand employability and communication skills used in an IT environment 5.Understand ethical and operational issues and threats to computer systems | Requirements analysis, design, coding/ implementation, testing, deployment, maintenance, comparison of development models | Market analysis, user interview and analysis | Case study (if it is unit 2 this year rather than unit 1 – see yr 13) and revise  Feasibility study MOSCOW constraints and limitations, feasibility study, | Case diagrams, site maps, DFDs, wireframes, visualisations, presenting to client |
| Key skills developed | Apply the fundamental principles and concepts of computer science: Use search technologies effectively, be discerning in evaluating digital content. Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. Use technology safely, respectfully and responsibly. Select, use and combine software on a range of digital devices to create digital products, that accomplish given goals, including collecting, analysing, evaluating and presenting data. | | | | | |

**Overall curriculum intent for year 13:** Students will gain the right combination of knowledge, understanding and skills required for the 21st century, enabling them to demonstrate the skills of writing specifications, and the design, build, testing and implementation of applications.  They will develop a solid foundation in the fundamentals of hardware, networks, software, the ethical use of computers and how businesses use IT.  Students will have a greater understanding of how organisations use information sources both internally and externally and the types of information they will encounter. The skills gained by completing this qualification will give them knowledge of the functionality of information and how data is stored and processed by organisations. They will also learn about how individuals use information of various types.

| | | Half term 1 | Half term 2 | Half term 3 | Half term 4 | Half term 5 |
|---|---|---|---|---|---|---|
| **Year 13** | Intent for the topic | Complete app prototype and accompanying evidence. Prepare for Unit 2 exam | Prepare for Unit 2 exam | Dependant on students: they are currently considering IOT or Game development | | Prepare for resit of unit 2 |
| | Content mapping | App development, testing, client presentation and feedback. Adaptations to final app prototype. Unit 2 exam - understand where information is held globally and how it is transmitted | Understand: styles, classification and the management of global information; the use of global information and the benefits to individuals and organisations; the legal and regulatory framework governing the storage and use of global information; the process flow of information. Case study | Research, design, develop, test and evaluate product of choice. | | All of unit 2 topics and case study preparation |
| | Key skills developed | Apply the fundamental principles and concepts of computer science: use search technologies effectively, be discerning in evaluating digital content. Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. Use technology safely, respectfully and responsibly. Select, use and combine software on a range of digital devices to create digital products, that accomplish given goals, including collecting, analysing, evaluating and presenting data. Use search technologies effectively, be discerning in evaluating digital content. | | | | |