GRANVILLE ACADEMY



Curriculum Guide for Computing

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1. Curriculum Rationale

Intent

Our vision for the Computing curriculum is to provide a high-quality education that inspires and empowers our students to become confident and creative problem solvers in the digital age. We believe that computing is an essential subject that equips students with the knowledge, skills, and attitudes they need to thrive in a rapidly changing world.

Our computing curriculum is designed to enable students to develop a deep understanding of computer science, information technology, and digital literacy. We aim to provide a broad and balanced education that is relevant to the lives and aspirations of our students, while also ensuring that they are equipped with the foundational knowledge and skills needed for further study in computing.

We believe that the Computing curriculum should encourage students to explore and experiment with a range of technologies and programming languages, and to apply computational thinking to solve real-world problems. We also believe that the computing curriculum should promote the safe and responsible use of technology, and help students to develop an understanding of the ethical and societal implications of digital technologies.

Ultimately, we want to enable our students to become active and informed citizens in a digital society, capable of contributing positively to their communities and making a difference in the world. We believe that by providing a high-quality computing education, we can help to ensure that our students are equipped to succeed in the 21st century and beyond.

Through our Computing curriculum, students will learn:

- The fundamental principles of computer science, including algorithms, programming and data structures
- How to use a range of software and hardware tools, including programming languages, databases, networks and multimedia applications
- How to apply computational thinking to solve real-world problems and create innovative solutions
- How to use technology safely, responsibly and ethically, with an understanding of the wider implications of digital technologies on society, culture and the economy.

Our KS4 option subject, Cambridge National Creative iMedia, curriculum aims to develop students' creative and technical skills in digital media production. It covers various topics such as visual identity, pre-production skills, digital graphics, comic book characters and comic books. The curriculum is designed to foster students' understanding of digital media concepts and their practical application in real-world contexts.

Implementation

Our Computing curriculum is designed to be engaging, challenging and relevant to the needs of our students in Years 7-11. We use a range of teaching and learning strategies to ensure that students are motivated, stimulated and able to make progress in their understanding and application of computing concepts and skills.

Our KS3 Computing curriculum is delivered through a range of units that are sequenced to build on previous learning and to develop students' knowledge and skills across the key areas of computer science, information technology, and digital literacy. Each unit is structured to include a mix of theory and practical activities, including problem-solving and coding challenges.

Our KS4 Curriculum offers students the choice of OCR GCSE Computing, Cambridge National in Creative iMedia and WJEC Vocational ICT. The GCSE course is delivered through a range of units that cover a range of topics, including programming, data management, networks, and cybersecurity. Each unit is structured to include a mix of theory and practical activities, including problem-solving and coding challenges. Our curriculum is aligned with the OCR GCSE Computing specification, ensuring that our students have the knowledge and skills needed to meet the requirements of the qualification.

The WJEC Vocational ICT course allows students to explore the wide range of uses of hardware, application and specialist software in society. Students will investigate how information technology is used in a range of contexts, including business and organisations, education and home use of information technology. The coursework element introduces learners to a broad working knowledge of databases, spreadsheets, automated documents and images and enables learners to apply their knowledge and understanding to solve problems in vocational settings.

The Cambridge National in Creative iMedia curriculum consists of three units: R093 Creative in the Media industry, R094 - Visual Identity & Digital Graphics and R095 - Comic Books & Characters. Each unit builds upon the knowledge and skills acquired in the previous units. The sequence of units is as listed above.

To deliver the curriculum effectively, a combination of teaching and learning strategies will be employed, including teacher-led instruction to introduce key concepts and techniques practical hands-on activities and projects to develop technical skills and creativity and case studies and real-world examples to illustrate the application of digital media concepts. To support the delivery of our Computing curriculum, we use a range of resources and technologies, including computers and iPads with the necessary software applications (e.g., Idle, Serif WebPlus, Serif DrawPlus, Microsoft Office, Sketchbook) and hardware for capturing and manipulating digital media. We also provide access to online learning resources and support, including videos, online tutorials and programming platforms.

We assess students' progress and attainment in Computing and Creative iMedia using a range of methods, including formative and summative assessments, coursework and practical projects. We provide regular feedback to students and use data to track progress and identify areas where additional support may be needed. This additional support is delivered through recall Do Now activities and homework tasks. In GCSE Computer Science we also provide opportunities for students to practice and refine their exam technique through regular class assessments, mock exams and targeted revision sessions.

SEND

The Computing curriculum is designed to meet the needs of all students so they develop their knowledge, skills and abilities to ensure they have access to a broad and balanced education. We intend to engage all students in exciting and relevant lessons to support students with SEND in understanding the content of lessons, we will link to their personal experiences to make it more meaningful for them. Students will access the full curriculum and will have scaffolded support through the use of teaching and learning strategies such as the Magnificent 7, where needed.

Furthermore, we intend to help students with SEND to overcome barriers to participating and learning, and make any reasonable adjustments, where needed, to include students within the broad areas of need. This includes setting challenging learning goals, responding to students' diverse learning needs through use of Individual Learning Plans (ILPs) and overcoming potential barriers to learning and assessment for particular individuals and groups of students. We understand that some students with SEND will show their understanding in different ways from their peers, so we seek to use a range of opportunities for students to demonstrate what they know they can do. We will celebrate inclusive pedagogy in the department and draw upon context-independent knowledge, as well as develop an inclusive mindset to increase the learning and engagement of all students.

Specifically, within Computing adaptations would include:

- Use visual aids, diagrams, and charts to help students visualise abstract concepts in Computing.
- Provide step-by-step visual instructions for coding or problem-solving tasks.
- Use physical manipulatives or objects to demonstrate computational concepts, such as binary numbers or algorithms.
- Assign group projects that allow students to work together to solve problems or create digital products.
- Use visual or verbal cues to help students remember the sequence of steps in programming or problemsolving.
- Incorporating a variety of learning activities and resources to cater to different learning preferences. Use a
 mix of written texts, videos, interactive online resources, and group discussions to accommodate diverse
 learning needs.

- Frequently reviewing and recapping previously covered material to reinforce learning. Use quizzes, games, and revision activities to help students consolidate their knowledge and reinforce key concepts.
- Encouraging collaborative learning and peer support. Pairing students with different strengths and abilities, promoting group work, and facilitating peer tutoring or mentoring to foster a supportive and inclusive learning environment.
- Provide alternative input devices (e.g., adapted keyboards, switches) for students with physical disabilities if required.

We believe that our approach to implementing the KS3 and KS4 Computing Curriculum is effective, inclusive, and inspiring, and will enable our students to develop the skills, knowledge, and understanding they need to succeed in the digital age, in further study or the workplace.

Impact

The **KS3 Computing curriculum** aims to have a significant impact on our students by equipping them with the necessary knowledge, skills, and qualities to thrive in the digital world. Through the study of computing, we expect our students to develop a range of competencies that will benefit them in their academic pursuits and everyday lives.

Knowledge:

- Students will gain a solid understanding of the key concepts and principles of computing, including computational thinking, algorithms, programming, data representation, and computer systems.
- They will acquire knowledge of different software applications and tools, allowing them to effectively use and navigate digital technologies.

Skills:

- Students will develop practical programming skills, enabling them to design, code, and debug programs to solve problems and create interactive projects.
- They will cultivate critical thinking and problem-solving abilities by applying computational thinking approaches to analyse and solve real-world problems.
- They will enhance their digital literacy skills, becoming proficient in using technology for research, communication, collaboration, and creativity.

Qualities:

- Students will become confident and responsible digital citizens, understanding the importance of ethical behaviour, privacy, and online safety.
- They will develop resilience and adaptability in the face of technological challenges, becoming adept at troubleshooting and finding alternative solutions.
- They will foster creativity and innovation, using computing as a means to express ideas, develop original projects, and contribute to the digital world.

The **OCR GCSE Computing curriculum** aims to have a significant impact on our students by providing them with a solid foundation in computer science, computational thinking, and problem-solving skills. Through the study of this subject, we expect our students to develop a range of knowledge, skills, and qualities that will benefit them in their future academic and professional pursuits.

Knowledge:

- Students will develop a deep understanding of key concepts in computer science, including algorithms, programming, data representation, computer networks, and cybersecurity.
- They will gain knowledge of programming languages and software development methodologies, allowing them to create functional programs and computational solutions.

Skills:

- Students will acquire practical programming skills and the ability to design, implement, and test algorithms to solve computational problems.
- They will develop computational thinking skills, enabling them to break down complex problems into smaller, manageable components and devise effective solutions.
- They will enhance their analytical and evaluative skills by critically examining the impact of computing on individuals, society, and the environment.

Qualities:

- Students will become confident and adaptable learners, capable of independently researching and exploring new concepts and technologies in the field of computing.
- They will cultivate resilience and problem-solving abilities by persisting through challenges and finding creative solutions to complex problems.
- They will develop responsible and ethical attitudes towards the use of technology, understanding the implications of their actions and making informed decisions.

The **Cambridge National Creative iMedia curriculum** aims to have a significant impact on our students by providing them with a comprehensive understanding of digital media and equipping them with the knowledge, skills, and qualities necessary for success in the creative industry. Through the study of this subject, we expect our students to develop a range of competencies that will benefit them in their academic pursuits, future careers, and everyday lives.

Knowledge:

- Students will gain a solid understanding of digital media production processes, including planning, creating, and evaluating digital media products.
- They will acquire knowledge of different types of digital media, such as graphics, animation and comic books.
- They will develop an understanding of digital technologies and their impact on society, including legal and ethical considerations.

Skills:

- Students will develop practical skills in using industry-standard software and tools for digital media production.
- They will cultivate creativity and design skills, allowing them to produce engaging and visually appealing digital media products.
- They will enhance their project management and problem-solving abilities, learning to plan, execute, and evaluate digital media projects effectively.

Qualities:

- Students will develop digital literacy skills, becoming proficient in using and evaluating digital media for personal and professional purposes.
- They will cultivate critical thinking and communication skills, enabling them to analyse and express ideas through digital media.

The **WJEC Vocational ICT curriculum** aims to have a significant impact on our students by providing them with a comprehensive understanding of fundamental ICT concepts and equipping them with the knowledge, skills, and qualities necessary for success in the IT industry. Through the study of this subject, we expect our students to develop a range of competencies that will provide the best service and advice possible for their clients and the industries they are working in.

Knowledge:

- Students will gain a solid a robust understanding of fundamental ICT concepts including a wide range of uses of hardware, application and specialist software in society. Students will investigate how information technology is used in a range of contexts, including business and organisations, education and home use of information technology.
- They will recognise how IT can be used to fulfil the needs of organisations and individuals as well as how data and information is used and transferred
- They will develop an understanding of legal, moral, ethical, cultural and environmental impacts of IT and the need for cybersecurity

Skills:

- Students will develop practical skills in using industry-standard software and tools for use in a variety of contexts.
- They will be able to plan, create, modify databases, spreadsheets and automated documents.

Qualities:

- Students will develop digital literacy skills, becoming proficient in using and evaluating software and applications for personal and professional purposes.
- They will develop responsible and ethical attitudes towards the use of technology, understanding the implications of their actions and making informed decisions.

The impact of our Computing curriculum extends beyond the classroom. By equipping our students with computational thinking skills and digital literacy, we aim to prepare them for further studies and future careers in fields such as computer science, software engineering, data analysis, and information technology.

We believe that the impact of our Computing curriculum will empower our students to be active and informed participants in the digital age. They will be equipped to leverage technology to solve problems, think critically, and make informed decisions. Furthermore, they will develop a lifelong love for learning and exploration in the ever-evolving field of computing.

2. What students will learn in our subject

Key Stage 3

Year 7	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	7.10	7.11
	File		Creating media – Introduction			Creating Media -			Clear Messaging		
	Management	Intro to	to vector		Branching	Photo	Spread-	Web page	in Digital	Scratch	Scratch
	& e-Safety	iPad	graphics	Networks	Databases	Editing	sheets	creation	Media	Part 1	Part 2
ar 8	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	8.10	8.11
	File										
۲e	Management	Vector		Reliable	Flat File	Video	Computing	Developing	Audio	Representations	Intro to
	& e-Safety	graphics	Spreadsheets	Sources	Databases	Production	Systems	for the Web	Production	- Binary	Python
r 9	9.1		9.2		9.3		9.4		9.5		9.6
Yea	Intro to Python		IT Project		Animations		Representations - Image and Sound		Cybersecurity		Physical Computing

Key Stage 4

OCR GCSE Computer Science

	Half-Term 1	Half-Term 2	Half-Term 3	Half-Term 4	Half-Term 5	Half-Term 6
Year 10	System	Storage	Numbering	Networking	Database	Further
	Architecture		Systems		Including SQL	Algorithms
			Denary, Binary Hex			Data Flow
		CPU	Python			Diagrams
			Programming			High Level
						Language
Year 11	Validation	Protocols	Operating Systems	IDE - Integrated	Revision	Revision
	Python	Producing	User Interface	Development		
	Programming	robust	Memory	Environments		
		programmes	Management			
		Network	Utility Software			
		Security	Defragmentation			
			Compression			

WJEC Vocational ICT

	Autumn Term	Spring Term	Summer Term
Year 10	Introduction to hardware and	How data and information is	Development of ICT skills continued
	software used by organisations	used and transferred	Application of ICT skills in context
	and individuals	The security of data	
	Development of ICT skills	The moral, ethical and legal	
	Application of ICT skills in	issues associated with ICT	
	context	The cultural, personal and	
	Consideration of the use of ICT	environmental impact of ICT	
	services	Development of ICT skills	
	How data and information is	continued	
	used and transferred	Application of ICT skills in	
		context	
Year 11	Completion of Unit 2 content	Unit 2 Assessment	Completion of Unit 2 assessment
	delivery	Reinforcement of Unit 1	Revision for Unit 1 examination
	Introduction to the Unit 2	content through Unit 2	Unit 1 examination to be taken
	assessment brief	assessment	
	Unit 2 Assessment		
	Reinforcement of Unit 1		
	content through Unit 2		
	assessment		

3. Curriculum Maps

OCR GCSE Computer Science



WORK HARD, BE KIND, CHOOSE WISELY

4. Assessment Plan

Key stage 3

Students will complete a short summative test at the end of each unit. In addition, they will also complete two formal cross-trust assessments an will be based on a range of topics that have been covered. The formal assessment will be marked and feedback will be given allowing the student time to evaluate their work and make changes.

GCSE Computer Science

Students will complete one formal assessment task per unit of their GCSE course (11 in total). These tasks are drawn from previous examination papers and therefore will be marked according to the GCSE mark schemes. They will also participate two mock exams, on in Year 10 and one in Year 11.

Formative Whole Class/Live marking assessments will take place alongside key assessments in order to embed, develop and consolidate the skills and knowledge required for GCSE success.

Final Assessment Breakdown

J277/01: Computer systems / 1 hour and 30 minutes / 50% of total GCSE J277/02: Computational thinking, algorithms and programming / 1 hour and 30 minutes / 50% of total GCSE

5. Cultural Capital

In Computing, students develop their cultural capital through spiritual, moral, social and cultural development.

Spiritual: students develop their spirituality through exploring creativity and imagination in the design and construction of digital products. Students' self-esteem is promoted through the presentation of work to others. Students explore how ideas in computing have inspired others and they create digital products, which incorporate their own beliefs.

Moral: students develop morally through the encouragement of good etiquette when using digital technology including mobile devices and with due regard to e-safety. In computing, we encourage respect for other people's views and opinions as well as developing respect for the computer room and the equipment students' use and how this affects others. In addition, students learn respect in the use of digital equipment and its impact on the environment — for example, ink and paper wastage. Students also explore moral issues around the use of digital technology - For example, copyright and plagiarism.

Social: students are encouraged to assist one another in problem solving. In Computing, students are encouraged to model appropriate social behaviours in the classroom including listening whilst others are talking and generally interacting as a caring community. We also encourage good practice and respect in the use of social networking.

Cultural: Encourage the sensible use of digital technology in the classroom and homework situations given that students are currently living in a digital world. Encourage an awareness and appreciation of the digital divide and to be aware of differing cultural and spiritual or religious views towards the use of digital technology.

At KS4 students will explore the ethical, legal, cultural and environmental impacts of digital technology.

6. Homework

Homework is set in line with the Academy homework policy to embed the learning from the classroom and develop their skills to be successful in the assessments. We provide students with many resources to access to aid with revision as well as Knowledge Organisers and tasks to recall or apply knowledge.