Curriculum Overview

Computing

Subject Leader

Mr P Durber

Intent

Key stage 3

Develop learner's knowledge, skills and understanding through key computational concepts and experience. The KS3 curriculum has been designed to ensure learners have sufficient knowledge to stay safe online and use computers safely in life. The KS3 curriculum also provides a focus on developing resilient learners who are able to recover from mistakes and effectively solve problems. The topics at KS3 give a basis of knowledge, skills and understanding to allow students to access IT tools in the subjects taught across the school and beyond.

Implementation

Key stage 3

In year 9 all students will be taught for a lesson a fortnight, covering the following topic areas.

- Typing and Keyboard Skills
  Learn touch typing techniques to improve speed and accuracy.
- Internet Safety and Digital Citizenship
  Understand how to stay safe online, protect personal information, and identify cyberbullying or scams.
- Basic Coding and Programming
  Explore beginner-friendly programming languages like Scratch and Python.
- Using Productivity Tools
  Develop skills in Google Workspace tools for school and personal projects.
- File Management and Organization
  Learn how to save, organize, and retrieve files effectively.
- Introduction to Cloud Computing
  Understand how to use tools like Google Drive and OneDrive for collaboration.
- Introduction to using AI ethically.
  Understand the advantages and disadvantages of AI in the modern world

Intent

Key stage 4

The intent of the KS4 curriculum is for students to develop the mind-set of a computer scientist. Learners have the opportunity to develop their capability, creativity and knowledge in computer science, from year 9 and digital media and information technology from year 10.

Students have two possible routes at KS4; GCSE Computer Science which is a year 9 option choice, and Creative iMedia which is available to choose in year 10. Both qualifications prepare for the next stages with regard to the BTEC and A Level Computer Science.

GCSE Computer Science is targeted towards the more able and the Creative iMedia course is focused towards those students who prefer a vocational approach to learning. Students considering taking the Computer Science course should be expecting to achieve at least a grade 4 at GCSE in Mathematics.

The curriculum sequences knowledge and skills cumulatively through the teaching of content by unit, followed by the use of online learning platforms in order to help condense and summarise information.

Differentiation, particularly for SEND, helps access to the same curriculum through the use of differentiated video guides, worksheets and support materials.

Students also benefit from resources which aim to extend their writing by following a 'What, how, why' approach in order to structure annotations.

The use of ePortfolios across all key stages pull everything together in one place, similar to an exercise book.

The curriculum is appropriately and continuously challenging through the use of extension tasks and exam application opportunities.

Implementation

Key stage 4

GCSE Computer Science

The GCSE Computer Science curriculum is taught unit by unit. At the end of each unit students conduct three assessments.

- A written assessment
- Regular low stakes knowledge assessments
- Recall activities

Students experience a spread of questions going back through all previous units to test long term recall.

The GCSE Computer Science curriculum is a single level entry exam. We clearly differentiate in our lessons to ensure lower ability pupils can access the material and that higher ability pupils are challenged by it.

Clear differentiation is built into all GCSE SOLs on powerpoint presentations and, where necessary, is explained in the detailed lesson plans and teacher guidance notes.

Extension activities are built into our ePortfolios and help is available for students if they are stuck with a task.

'Support' and 'challenge' activities are included within all of our lesson plans.

Allocated curriculum time

	Y9	Y10	Y11
Fortnightly lesson allocation	4	4	4

Year 9

Term	Unit
1&2	**Fundamentals of Computer Systems and Introduction to Python coding** ● Introduction to Computer Science & Computational Thinking ● Components of a Computer System (hardware and software) ● Introduction to Python Programming (syntax, variables, and data types) ● Input/Output and Arithmetic Operations ● Memory and Storage (RAM, ROM, secondary storage, and cloud storage) ● Selection and Iteration (if/else, for/while loops) ● Data Representation (binary numbers, hexadecimal, ASCII, and Unicode) ● End-of-term Review and Assessment
3&4	**Networks and Cyber Security** ● Types of Networks (LAN, WAN, topology, and the internet) ● Protocols and Layers (HTTP, FTP, TCP/IP) ● Practical Programming Challenges ● Introduction to Cyber Security (threats, vulnerabilities, and malware) ● Revision and Practical Tasks ● Mid-Year Assessment and Feedback
5&6	**FURTHER PROGRAMMING IN PYTHON** ● Introduction to Flowcharts as a planning tool. ● Procedures, functions and Libraries. ● Programming Challenges - Improving coding skills through inspiring and stimulating programming challenges. ● End Of Year Review, revision and Assessment

Year 10

Term	Unit
1&2	**Algorithms and Programming** • Searching and Sorting Algorithms (binary search, bubble sort) • Understanding Algorithms (pseudocode, advanced flowcharts) • Advanced Iteration and Selection Techniques • Debugging techniques and tools • Term Assessment (algorithmic thinking focus)
3&4	**Systems Software and Networks (Part 2)** • Operating Systems (functions, file management, and utilities) • Network Security (firewalls, encryption, and VPNs) • Ethical, Legal, and Environmental Issues in Computing • Practical Networking Challenges • Mid-Year Assessment and Feedback
5&6	**Data Representation and Logic** • Representing Images and Sound • Compression Techniques (lossy and lossless) • Boolean Logic (AND, OR, NOT, truth tables) • Practical Exercises on Data and Logic • End-of-Year Review and Mock Exam Preparation

Year 11

Term	Unit
1&2	**Advanced Programming and Problem-Solving** • Functions and Procedures in Python • Data Structures (lists, dictionaries, and arrays) • File Handling in Python • Developing Complete Programs (mini-projects) • Mock 1 revision and review
3&4	**Exam Theory Consolidation**

	● Revisiting Key Topics in Computer Systems ● Revisiting Networks and Security ● Revisiting Data Representation ● Exam-style Questions and Practice Papers ● Mock 2 Exams revision and Feedback
5&6	**Final Preparation** ● Revision of Algorithms and Programming Concepts ● Tackling Exam Technique (timing, understanding command words, structuring answers) ● Final Practice Papers ● Individual Support and Review

Practical Programming Project (Ongoing)

Throughout Years 2 and 3, students will work on programming projects aligned with OCR's specification to develop their problem-solving, design, and coding skills. This project should cover:

- Planning and designing solutions
- Writing code and testing
- Evaluating and refining solutions

Computer Science

Course and Exam details

The Computer Science GCSE will enable students to develop a real, in-depth understanding of how computer technology works, giving them an insight into what goes on 'under the lid' of a computer. You will need to think creatively, innovatively and logically to design and program solutions to real-world problems.

Students will investigate the components that make up digital systems and how they communicate with one another and with other systems, they will also develop an understanding of the impacts of digital technology to the individual and to wider society.

Exam details

Unit 1 - Computer Systems

- *50% Examination*
- A 90 minute written paper examining students' knowledge of computer systems. The paper includes short and long answer questions covering the physical elements of computer science such as computer hardware, wired and wireless networks, system security and software. The paper also covers the social, legal and environmental effects of computer systems.

Unit 2 - Computational thinking, algorithms and programming

- *50% Examination*
- A 90 minute written paper examining students' knowledge of program design and creation. The paper covers data representation in computer systems, logical problem solving and high and low level programming.

Supporting your child

Computer Science is a very academic and challenging GCSE. Students need to revise thoroughly as there is a large amount of content to remember. Students who are successful also practise programming regularly outside of school. Encouraging your child to make revision flash cards, mind maps and comprehensive notes will aid their long term retention. They can use the presentations on the google classroom for this information.

Online Revision Links

Craig n' Dave have produced a fantastic set of video tutorials for this course. They can be found here.

https://tinyurl.com/j277videos

Revision Guide Details

A comprehensive revision book can be found on Amazon for £6.80.
https://tinyurl.com/j277book

Revision Tips

Look at as many of the past papers on the google classroom as possible. Also look at the mark scheme for these and the examiner reports which shine a light on where others have gone wrong in the past.

GCSE Creative IMedia

GCSE Creative iMedia is an engaging and practical course designed for students who are interested in digital media and creative technology. This qualification provides an introduction to the tools and techniques used in the media industry, preparing students for further education and careers in the creative sector. The course balances creative design with technical skills, making it ideal for those who enjoy both artistic and technological pursuits.

Allocated curriculum time

	Y10	Y11
Fortnightly lesson allocation	6	5

Year 10

Term	Unit
1&2	**R093 - Creative iMedia in the Media Industry (Exam Unit)** **Week 1-3: Understanding the Media Industry** ● Roles and purposes of media products. ● Target audiences and their needs. **Week 4-6: Pre-Production Documents** ● Scripts, storyboards, visualisation diagrams, and mood boards. ● Analysis of pre-production documents. **Week 7-9: Planning Techniques** ● Work plans, production schedules, and client requirements. ● Introduction to legislation (copyright, intellectual property, privacy). **Week 10-12: Revision and Exam Skills** ● Mock exam questions: command words, structure, and timing.

	• Feedback and improvement.
3&4	**R093 (Continued)** **Week 1-3: Media Sectors and Distribution** • Types of media products and their platforms (e.g., print, digital, interactive). • Methods of distribution. **Week 4-6: Health & Safety and Legislation** • Risk assessments and safe working practices. • Ethical, legal, and regulatory issues in media. **Week 7-8: Revision and Exam Practice** • Consolidation of all R093 content. • Practice papers and feedback. **Week 9: Mock Exam** • Conduct a full mock exam for R093. • Review and feedback from the exam
5&6	**Start Coursework Unit (R094 - Visual Identity and Digital Graphics)** **Week 1-3: Introduction to R094** • Understanding visual identity and branding. • Researching client requirements. **Week 4-6: Creating Pre-Production Documents** • Producing mood boards, sketches, and visualisation diagrams. • Receiving client feedback. **Week 7-8: Digital Graphics Tools** • Introduction to graphic design software (e.g., Adobe Photoshop, Illustrator, or Canva). • Exploring techniques like layering, cropping, and filters. **Week 9: Practical Task** • Create a sample graphic for a fictional client.

Year 11

Term	Unit

1&2	**Complete R094 - Visual Identity and Digital Graphics** **Week 1-3: Creating Digital Graphics** ● Producing assets for a client project. ● Using advanced design techniques (text effects, gradients, and exporting). **Week 4-5: Review and Feedback** ● Evaluate final graphics against client requirements. ● Iterating and refining work. **Week 6-7: Final Submission** ● Complete and submit R094 coursework. **Week 8-12: Start Second Coursework Unit** ● Select a second coursework unit (e.g., R095: Characters and Comics or R096: Interactive Media Products or R099 Computer Games). ● Begin the planning for the coursework
3&4	**Second Coursework Unit** **Week 1-3: Research and Planning** ● Analyze the requirements for the chosen coursework unit. ● Create pre-production documents (e.g., storyboards, character designs, or sitemaps). **Week 4-6: Developing the Product** ● Practical work using relevant software (e.g., comic design tools, animation software, or web development tools). ● Focus on technical and creative skills. **Week 7-8: Testing and Refining** ● Peer and client review. ● Making improvements to meet specifications. **Week 9: Submission** ● Finalize and submit the second coursework unit.
5&6	**Exam Preparation and Coursework Catch-Up** **Week 1-3: R093 Revision** ● Recap all key topics from Year 1. ● Practice exam papers and revision sessions. **Week 4-5: Exam Skills** ● Time management, structuring answers, and handling command words. ● Mock exam with detailed feedback. **Week 6-7: Final Coursework Adjustments**

- Address any outstanding work on coursework units.
- Submit final drafts for moderation.

Week 8-9: Final Exam Preparation

- Final review sessions.

Additional Notes

- **Homework Assignments:** Students should complete tasks such as research, pre-production planning, and revision to maximize lesson time for practical work.
- **Software Used:** Use industry-standard tools like Adobe Creative Suite, Canva, or open-source alternatives such as GIMP or Blender.
- **Assessment:** Regularly assess student progress through formative feedback and mock assessments.

Cambridge Nationals - Creative iMedia

Course and Exam details
The new revised Cambridge Nationals in Creative iMedia is designed to engage and enthuse young people with an interest in creative computing (e.g. multimedia, website and digital graphic development).

This qualification will equip them with the knowledge, skills and understanding they need to design and make effective digital products. It teaches young people how to express their creativity in an informed and responsible way and encourage them to reflect on what they produce and strive for excellence. It gives young people the skills they need to support future learning and to exploit the creative and commercial employment opportunities on offer in the digital world in which they are growing up.

Supporting your child
Coursework accounts for 60% of the course and therefore you can support your child by ensuring they attend any catchups which are set by the IT staff. You can also encourage them to work at home on any improvements which have been suggested.

Ahead of the exam, students should use the presentations we have placed on the google classroom. You could encourage your child to look at these and make notes, flashcards or mindmaps based on this information. There are also video guides on the classroom as well which help explain the content.

Online Revision Links
We have invested heavily in revision resources and these are all placed on your child's google classroom. Students need to revise for the exam using the presentations on the google classroom.

Revision Guide Details
A more comprehensive revision book can be found on Amazon for £8.
https://tinyurl.com/r834-revision

Revision Tips
Look at as many of the past papers on the google classroom as possible. Also look at the mark scheme for these and the examiner reports which shine a light on where others have gone wrong in the past.