*Computer Science Curriculum Plan 2022-23*

| | **Year 10** | **Year 11** |
|---|---|---|
| Level 2 Certificate in iMedia | Creating digital graphics and Digital Animation | Story telling with a comic strip and Pre-production skills |
| Computer Science | Computational thinking, algorithms and programming | Computer systems |

<table>
<tr><td></td><td>Key Stage 4</td></tr>
<tr><td>Algorithms</td><td rowspan="3">Develop and apply their analytic, problem solving, design and computational thinking skills<br><br>Develop their capability, creativity and knowledge in computer science, digital media and information technology</td></tr>
<tr><td>Programming</td></tr>
<tr><td>Hardware / Data representation</td></tr>
<tr><td>Digital Media</td><td></td></tr>
<tr><td>eSafety</td><td>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</td></tr>
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## GCSE Computer Science - Curriculum Intent

**Students will be taught to:**

● develop their capability, creativity and knowledge in computer science, digital media and information technology
● develop and apply their analytical, 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 identify and report a range of concerns.
Source: DfE Computing

**Assessment Objective:**

AO1. Demonstrate knowledge and understanding of the key concepts and principles of Computer Science.
AO2. Apply knowledge and understanding of key concepts and principles of Computer Science.
AO3. Analyse problems in computational terms:
● to make reasoned judgements
● to design, program, evaluate and refine solutions.
Source: Specification, page 34

**Content**

The course follows the OCR 9-1 GCSE Specification, is split into two main sections:

- Paper 1 - Computer Systems
- Paper 2 - Computational Thinking, Algorithms and Programming

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|---|---|
| Exam Board | OCR- GCSE - Computer Science (9-1) - J277 (from 2020) - OCR |
| Specification | Computer Science – J277 (from 2020) |
| Assessment | 2 Written Exams |
| Useful online resources | Craig'n'Dave - YouTube<br>GCSE topics — Isaac Computer Science |
| Recommended course book | New GCSE Computer Science OCR Revision Guide: fully updated for the new exams in 2022 & 2023 (CGP GCSE Computer Science 9-1 Revision) |
| Equipment required for lessons | Regular stationery, scientific calculator (readily available for around £8-10), ruler, lined paper, lever arch file for notes. |

## Computer Systems

Students are introduced to the components of a computer system, networks, data representation and the ethical, cultural and environmental issues of computing. The content is delivered in a range of classroom based activities whilst having hands-on lessons of key parts (including the CPU, network hardware and topologies and research for the environmental costs to the modern computing world and what can be done to address these).

## Computational Thinking, Algorithms and Programming

Students are taught the key skills associated with algorithms (pseudocode, flowcharts, computational thinking and searching / sorting algorithms), IDEs and design and testing (looking at languages, translators and how to create robust programs), and programming specifics (including the OCR Exam Reference Language, data types, operators, constants and variables, strings, program flow, Boolean logic, random numbers, arrays, file handling, data and sub programs).

The computational thinking module is taught alongside hands-on Python coding, where students are introduced to a concept and then spend a few lessons writing out real-world code based programs to solve given tasks. This includes mini-code projects as well as larger, multi-week programming challenges such as encryption and game development in order for students to have a genuine understanding of computer programming

## GCSE Computer Science Assessment

Students will sit two terminal papers, both 1 hour and 30 minutes long written papers (Paper 1 / Paper 2).

Throughout the course, students will also have experience of mock papers (June/July in Year 10 and December and March in Year 11). Throughout the course, weekly computer science homework is set as well as termly assessment points (both in taught content and programming skills).

Students receive feedback as they progress their programming journey, and are expected to progress their own learning at home with logic puzzles, challenges and Python specific tasks. A range of summative and formative tests are used, with a focus on low stakes but high impact questioning to steer students into forming their own solutions to given problems.

**Course Content** **Year 10**

| | |
|---|---|
| Half Term 1 | Introduction to the course<br>1.1 Systems architecture<br>o 6 lessons<br>1.2 Memory and storage – Part 1<br>o 5 lessons<br>• Plus 5 dedicated programming lessons YEAR 10 |
| Half Term 2 | 1.2 Memory and storage – Part 1<br>o 2 lessons<br>• SLR 1.2 Memory and storage (Part 2)<br>o 12 lessons<br>• Plus 6 dedicated programming lessons Topics |
| Half Term 3 | 1.3 Computer networks, connections and protocols<br>o 12 lessons<br>• Plus 3 dedicated programming lessons |
| Half term 4 | 1.3 Computer networks, connections and protocols<br>o 2 lessons<br>1.4 Network security<br>o 10 lessons<br>• Plus 3 dedicated programming lessons |
| Half Term 5 | 1.4 Computer networks, connections and protocols<br>1. 2 lessons<br>1.5 System software<br>2. 6 lessons<br>• Plus 5 dedicated programming lessons |
| Half Term 6 | 1.6 Ethical, legal, cultural and environmental concerns<br>o 9 lessons<br>8 lesson text-based adventure game |

***Course Content*** **Year 11**

| | | |
|---|---|---|
| Half Term 1 | 1.3 Computer networks, connections and protocols<br>○ 12 lessons<br><br>1.3.2 Wired and wireless network Protocols and layers.<br><br>1.4.1 Threats to computer system and networks<br><br>1.4.2 Identifying and preventing vulnerabilities | Mock Exam Preparation – Paper I and Paper II content<br>Computational Thinking, Algorithms and Programming – Design / Testing Topic (Unit 2 Section 3)<br><br>• Languages<br>• Translators<br>• IDEs<br>• Robust Programs – Defensive Design, Validation and Sanitisation<br>• Robust Programs – Maintainability and Errors<br>• Robust Programs – Testing |
| Half Term 2 | Computer Systems Review<br><br>1.1.CPU<br><br>1.2.3 Units<br><br>1.2.2 Secondary Storage<br><br>1.5.1 Operating Systems and Utilities | GCSE Revision of key content<br>Computational Thinking, Algorithms and Programming – Algorithms Topic (Unit 2 Section 1)<br><br>• Computational Thinking<br>• Pseudocode and Flowcharts<br>• Algorithm Searching<br>• Algorithm Sorting (Bubble)<br>• Algorithm Sorting (Merge)<br>• Algorithm Sorting (Insertion) |
| Half Term 3 | Summary of all content<br><br>Exam Preparation – Paper I and Paper II content | Summary of all content<br><br>Exam Preparation – Paper I and Paper II content |
| Half term 4 | Summary of all content<br>Exam Preparation – Paper I and Paper II content | |
| Half Term 5 | Summary of all content<br>Exam Preparation – Paper I and Paper II content | |

## Creative iMedia- Curriculum Intent

**Year 10**

| **Creative iMedia Year 1 Learning outline** | |
|---|---|
| Half term 1<br>**R093:** Media industry sectors and products (TA1)<br>**R093:** How style, content and layout are linked to the purpose. Client requirements and how they are defined (TA2)<br>**R093:** Audience demographics and segmentation (TA2)<br>**R093:** Media codes used to convey meaning, create impact and/or engage audiences (TA2) | Half term 2<br>**R093:** Work planning and documents used to support ideas generation (TA3)<br>**R093:** Documents used to design/plan media products (TA3)<br>**R094:** Purpose, features, elements and design of visual identity<br>**R094:** Graphic design concepts and conventions<br>**R094:** Properties of digital graphics and use of assets |
| Half term 3<br>**R094:** Techniques to plan visual identity and digital graphics<br>**R094:** Tools and techniques to create visual identity and digital graphics<br>**R094:** Technical skills to source, create and prepare assets for use within digital graphics | Half term 4<br>**R094:** Techniques to save and export visual identity and digital graphics (with integrated **R093** TA4 distribution considerations and file formats)<br>**R094:** NEA Assessment (working on) |
| Half term 5<br>**R094:** NEA Assessment (Working on and submit[1] for moderation)<br>**Optional unit TBC:** TA1 Introduction (with R093 key content embedded) | Half term 6<br>**Optional unit TBC:** Features and conventions<br>**Optional unit TBC:** Creativity in creation<br>**Optional unit TBC:** Resources required to create |

| **Creative iMedia Year 2 Learning outline** | |
|---|---|
| Half term 1<br>**Optional unit TBC:** Pre-production and planning documentation and techniques | Half term 2<br>**Optional unit TBC :** Techniques to obtain, create and manage assets<br>**R096:** Techniques used to create |
| Half term 3<br>**Optional unit TBC:** Techniques to save and export<br>**Optional unit TBC:** Techniques to test/check and review<br>**Optional unit TBC:** Improvements and further developments | Half term 4<br>**Optional unit TBC:** NEA Assessment (Working on)<br>**R093:** Distribution platforms and media to reach audiences (TA4)<br>**R093:** Properties and formats of media files (TA4) |
| Half term 5<br>**Optional unit TBC:** (submit[1] for moderation)<br>**R093:** Sources of research and types of research data (TA2)<br>**R093:** The legal issues that affect media (TA3)<br>**R093:** Job roles in the media industry (TA1) | Half term 6<br>**R093:** Revision and mock papers/tests<br>**R093:** Examination (Terminal unit) |

**Year 11**

| **Creative iMedia Year 11 2022-23 Learning outline** | |
|---|---|
| Half term 1<br>• R082 Creating digital graphics NEA completion<br>• R085 Creating a multipage website Learning Outcome 1: Understand the properties and features of multipage websites<br>• R085 Creating a multipage website Learning Outcome 2: Be able to plan a multipage website | Half term 2<br>• R085 Creating a multipage website Learning Outcome 3: Be able to create multipage websites using multimedia components<br>• R085 Creating a multipage website Learning Outcome 4: Be able to review a multipage website<br>• R085 Creating a multipage website NEA completion |
| Half term 3<br>• R084 Story telling with a comic strip Learning Outcome 1: Understand comic strips and their creation<br>R084 Story telling with a comic strip Learning Outcome 2: Be able to plan a multipage comic strip<br>• R084 Story telling with a comic strip Learning Outcome 3: Be able to produce a multipage comic strip | Half term 4<br>• R084 Story telling with a comic strip Learning Outcome 3: Be able to produce a multipage comic strip<br>• R084 Story telling with a comic strip Learning Outcome 4: Be able to review a multipage comic strip<br>• R084 Story telling with a comic strip NEA |
| Half term 5<br>• R084 Story telling with a comic strip NEA | |

## How can parents/carers support their child at KS4 Computer Science?

| Key Stage 4 Computer Science | Key Stage4 Creative iMedia |
|---|---|
| 1. Encourage your child to respond to teacher feedback, making improvements to their work and catching up on anything missed.<br>2. Encourage your child to spend time revising from their school documents / H-Drive and revision guides. Talking to your child about their learning in the subject and testing them on their knowledge will help them to commit it to their long-term memory.<br>3.If your child does not have a copy of the following revision guide we would highly recommend it to help support their revision. It includes all topics that they will be assessed on in their final examinations. New GCSE Computer Science OCR Revision Guide: fully updated for the new exams in 2022 & 2023 (CGP GCSE Computer Science 9-1 Revision) : CGP Books, CGP Books: Amazon.co.uk: Books<br>4. Visit the following websites that will support your learning:<br>GCSE (J277): OCR Specification Order - YouTube<br>OCR GCSE Computer Science (9-1) Introduction - J276 - YouTube<br>Free revision online sessions for Computer Science<br>https://isaaccomputerscience.org/ | 1. Encourage your child to respond to teacher feedback, making improvements to their work and catching up on anything missed.<br>2. Encourage your child to spend time revising from their exercise books and revision guides. Talking to your child about their learning in the subject and testing them on their knowledge will help them to commit it to their long-term memory.<br>3.If your child does not have a copy of the following revision guide we would highly recommend it to help support their revision. It includes all topics that they will be assessed on in their final examinations. Cambridge National in Creative iMedia Revision Guide and Workbook with Digital Access (2 Years): Level 1/Level 2 (Cambridge Nationals) : Eyres, Jennie: Amazon.co.uk: Books<br>4. Visit the following websites that will support your learning:<br>Introduction to Cambridge Nationals Creative iMedia - YouTube |

## Homework Policy for Computer Science:

| Key Stage 4 |
| --- |
| *Frequency:* Homework tasks will be set on a weekly basis where appropriate. Students are encouraged to attend extra support sessions to complete practical tasks and controlled assessment folder work. Where necessary teachers will be available at dedicated times after school to support students with controlled assessment and practical tasks.<br><br>**Types of tasks:**<br>▪ Reinforce and extend learning in class e.g. to practise examination questions.<br>▪ Research in preparation for future tasks e.g. research controlled assessment tasks.<br>▪ Embed key subject content in long term memory, e.g. the ICT Legislation.<br>▪ Extension of learning from the lesson e.g. comprehension questions related to key learning.<br>▪ Learning and revision for class tests and examinations e.g. mind maps, cue cards, concept maps.<br>▪ Improvement and use of DIRT time to improve or develop set tasks |

## Type and frequency of feedback by Key Stage: Computing/ICT

| Key Stage 4 |
| --- |
| ▪ All teachers will provide verbal feedback throughout projects.<br>▪ All teachers will mark extended written work to correct paragraphing, sentence structure and elements of punctuation plus spelling errors.<br>▪ Peer assessment and self-marking is used where we deem it appropriate.<br>▪ In year 10 and 11 Computer Science the tasks should be marked and given percentage / mark / grade as appropriate.<br>▪ In year 10 and 11 Creative iMedia all work must be marked with relevant mark grids with verbal guidance on how to improve. Formal feedback of the assessment is not permitted by the exam board.<br>▪ Ultimately the marking grid should be used in order to assess the units. Teachers should tick as a criterion is achieved. |