# Computing

Computing has deep links with Maths, Science, and Design & Technology. At its core is **Computer Science**, in which pupils 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, pupils are equipped to use information technology to create programs, systems and a range of content.

Computing also ensures that pupils 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.
In line with the demands of the new National Curriculum for Computing, we are currently developing new schemes of work for 2016 and beyond. In order to allow pupils to pursue both ICT and Computer Science at GCSE, it is anticipated that the programme followed by your child during Key Stage 3 will look something like this:

## Year 7

- An Introduction to Computing at Idsall
- Unit 1 – Programming with Scratch
- Unit 2 – An Introduction to Data, Data Representation & Databases
- Unit 3 – Animal Rescue Project (ICT skills)
- Unit 4 – An Introduction to HTML & CSS (web development)
- Unit 5 – Hardware & Processing (input devices, output devices, storage devices)

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| Year 7 Computing | Autumn 1 | Autumn 2 |
| | • An Introduction to Idsall's Network & eSafety.<br>• Programming with Scratch. | • Programming with Scratch.<br>• An introduction to data, data representation and databases. |
| | Spring 1 | Spring 2 |
| | • Data, data representation and databases.<br>• Animal Rescue Project (spreadsheets, DTP, word processing) | • Animal Rescue Project (spreadsheets, DTP, word processing)<br>• HTML & CSS (web development). |
| | Summer 1 | Summer 2 |
| | • HTML & CSS.<br>• Input, output and storage devices. | • Input, output and storage devices. |




## Year 8

- Unit 1 – An Introduction to Programming with Python
- Unit 2 – An Introduction to Relational Databases (MS Access)
- Unit 3 – Electronic Time Capsule – web development with Dreamweaver
- Unit 4 – An Introduction to Computer Networks (LAN/WAN, peer-peer/client-server, topologies, MAC addresses, IP addresses, router, hub, switch, etc)
- Unit 5 – An Introduction to Hardware & Processing (RAM, cache, CPU, cores, clock speed, etc)

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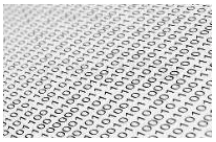
| Year 8 Computing | Autumn 1 | Autumn 2 |
| | • Programming with Python. | • Relational Databases (tables, forms, queries and reports) |
| | Spring 1 | Spring 2 |
| | • Electronic Time Capsule (wed development with Dreamweaver) | • Computer Networks |
| | Summer 1 | Summer 2 |
| | • Hardware & Processing | • Hardware & Processing |






## Year 9

- Unit 1 – More programming with Python
- Unit 2 – Data & Data Representation (binary, hex, text, bitmaps, sound, etc)
- Unit 3 – Music Festival Project (ICT skills)
- Unit 4 – Network design Project
- Unit 5 – Hardware & Processing (Boolean algebra, logic gates, truth tables, etc)

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| Year 9 Computing | Autumn 1 | Autumn 2 |
| | • Python programming | • Data & Data Represenation |
| | Spring 1 | Spring 2 |
| | • Music Festival Project (ICT skills) | • Network design project |
| | Summer 1 | Summer 2 |
| | • Hardware & Processing | • Hardware & Processing |

## Key Stage 4

ICT and Computer Science are offered as options in Key Stage 4.

**ICT (OCR Cambridge Nationals in ICT)**

The OCR Cambridge Nationals are vocationally related qualifications that take an engaging, practical and inspiring approach to learning and assessment.
ICT skills are essential for success in employment and higher education, and are among the fundamental transferable skills required by employers. Cambridge Nationals deliver these skills across the whole range of learning styles and abilities, effectively engaging and inspiring all to achieve great things.

At present, assessment is made via the following elements.

- R001 – Understanding Computer System (written examination)
- R002 – Using ICT to create Business Solutions (internally assessed assignment)
- R006 – Creating Digital Images (internally assessed assignment)
- R005 – Creating an Interactive Product using Multimedia Components (internally assessed assignment)

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| Year 10 | Autumn 1 | Autumn 2 |
| | • R002 – Spreadsheets, DTP, presentation, databases and word-processing. | • R002 – Spreadsheets, DTP, presentation, databases and word-processing. |
| | Spring 1 | Spring 2 |
| | • R002 – Spreadsheets, DTP, presentation, databases and word-processing.<br>• R006 – Image editing with Photoshop | • R006 – Image editing with Photoshop |
| | Summer 1 | Summer 2 |
| | • R006 – Image editing with Photoshop | • R006 – Image editing with Photoshop |

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| Year 11 | Autumn 1 | Autumn 2 |
| | • R001 – ICT theory – Understanding Computer Systems (inputs, outputs, storage devices, communication methods, legislation, assistive technology, etc, etc. | • R001 – ICT theory – Understanding Computer Systems (inputs, outputs, storage devices, communication methods, legislation, assistive technology, etc, etc. |

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| | Spring 1 | Spring 2 |
| | • R001 – ICT theory – Understanding Computer Systems (inputs, outputs, storage devices, communication methods, legislation, assistive technology, etc, etc.<br><br>• R005 – Creating an Interactive Product using Multimedia Components (use of Dreamweaver to create a promotional website for a Company) | • R005 – Creating an Interactive Product using Multimedia Components (use of Dreamweaver to create a promotional website for a Company) |
| | Summer 1 | Summer 2 |
| | • R005 – Creating an Interactive Product using Multimedia Components (use of Dreamweaver to create a promotional website for a Company) | |

**COMPUTER SCIENCE**


Computing is everywhere and, for most of us, life without computers is unimaginable, with computer systems affecting most of the things that we do. For example, computers are used for entertainment, to do business, control machinery, navigate planes, support administration and communicate.

Obviously, a GCSE in Computer Science gives pupils skills needed to start their journey towards a career in computer science. But even more than this, it will give them some of the skills you needed for any career. Want to become a designer, architect, engineer, publisher, medical researcher, sports coach, music or film producer (the list is endless)? Then Computer Science is one of the best points to start from.

Computer Science is an eBacc subject and recognised as the fourth Science, on a par with Physics, Biology & Chemistry.

**Year 10 (OCR GCSE Computer Science 1 - 9)**

Year 10 pupils are the first cohort on the 'new' GCSE Computer Science 1-9. Topics include:

1. **Problem Solving** (algorithms, decomposition and abstraction).

2. **Programming** (code development, constructs, datatypes and structures, input/output, operators and subprograms).
3. **Data** (binary, data representation, data storage and compression, encryption and databases).
4. **Computers** (hardware, logic, software and programming languages).
5. **Communication and the internet** (networks, network security, the internet and the worldwide web).
6. **The bigger picture** (emerging trends, issues and impact).

Assessment on this course is made via the following elements:

a) **Principles of Computer Science.** This component is assessed via a written examination, and counts for 40% of the final award. Topics 1-6 (see above) are tested. Examination to be sat when in Year 11.
b) **Application of Computational Thinking.** This component is assessed via a scenario based examination, and counts for 40% of the final award. The main focus is on Topics 1 and 2 (see above), but it may draw on all other topics. Examination to be sat when in Year 11.
c) **Computer Science Project.** This component is assessed via controlled assessment and counts for 20% of the final award. Pupils will design, write, test and refine a program in order to meet the requirements specified by OCR in a project brief. To be tackled when in Year 11.

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| Year 10 GCSE Computer Science 1-9 | Autumn 1 | Autumn 2 |
| | • Intro to course<br>• Systems architecture<br>• Memory<br>• Programming | • Storage<br>• Wired and wireless networks<br>• Programming |
| | Spring 1 | Spring 2 |
| | • Network topologies, protocols and layers<br>• Programming | • Systems security<br>• Systems software |
| | Summer 1 | Summer 2 |
| | • Ethical, legal, cultural and environmental concerns<br>• Programming | • Algorithms |

**Year 11 (OCR GCSE Computing)**

Year 11 pupils are the last cohort on the 'old' GCSE. Assessment on this course is made via the following elements:

1. A Written Examination. The written examination counts for 40% of the final award and tests the understanding of the fundamentals of computer systems, computing hardware, software, representation of data in computer systems, databases, computer communications and networking and programming. This will be taken at the end of Year 11.

2. A Practical Investigation. This controlled assessment counts for 30% of the final award and provides opportunities to, look at some practical uses of computing, investigate real-world examples of computer use and show some creativity by solving problems with a computer. This was completed in Year 10.

3. A Programming Project. This controlled assessment counts for 30% of the final award, and provides an opportunity to develop working code segments that could be used as part of larger programs. Pupils are expected to demonstrate logical thinking and problem solving skills using a suitable programming language. This will be completed during Year 11.

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| Year 11 GCSE Computing | Autumn 1 | Autumn 2 |
| | • Operating systems.<br>• Utility software.<br>• Application software.<br>• Databases.<br>• Database Management Software.<br>• Network design and components.<br>• The Internet. | • Python programming. |
| | Spring 1 | Spring 2 |
| | • Controlled Assessment (A453 programming project). | • Controlled Assessment.<br>• Revision. |
| | Summer 1 | Summer 2 |
| | • Revision. | • |

## Key Stage 5

## Y12 GCE AS Computer Science (OCR)

Designed after consultation with members of the British Computer Society and a number of top universities, OCR's AS and A Level Computer Science qualifications inspire and challenge students to apply the knowledge they gain with the creative and technical skills they acquire.

AS Assessment:

- Unit 1: Computing Principles (50%). This unit is assessed via written examination. Topics include: the characteristics of contemporary processors, input, output and storage devices; software and software development; data types, data structures and algorithms; legal, moral, cultural and ethical issues.

- Unit 2: Algorithms and Problem Solving (50%). This unit is assessed via written examination. Topics include: elements of computational thinking; problem solving and programming; algorithms.

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| Year 12 – AS Computer Science | Autumn 1 | Autumn 2 |
| | • Programming<br>• Structure & function of the Processor<br>• Types of Processor | • Programming<br>• Input, output and storage<br>• Data Types<br>• Boolean Algebra<br>• Operating Systems |
| | Spring 1 | Spring 2 |
| | • Programming<br>• Legislation<br>• Application Generation<br>• Software Development<br>• Compression, encryption, hashing<br>• Databases<br>• Networks | • Programming<br>• Ethical, moral and cultural issues<br>• Data Structures<br>• Types of programming language |
| | Summer 1 | Summer 2 |
| | • Programming<br>• Programming techniques<br>• Thinking abstractly<br>• Thinking procedurally<br>• Thinking logically<br>• Algorithms | • Exams<br>• A2 Introduction |

## Y12 BTEC ICT – (Edexcel / Pearson BTEC Certificate)

Designed to give pupils an up to date practical skill set with relation to ICT, Edexcel's BTEC in Information Technology both at Certificate and Extended Certificate level aim to inspire and challenge students, whilst giving them a range of practical skills that they can take with them into further education of employment.

Certificate (AS equivalent) Assessment:

- Unit 3: Using Social Media In Business (50%). This unit is assessed via a written assignment that contains 3 strands. Learners explore how businesses use social media to promote their businesses and services.
- Unit 2: Creating Systems to Manage Information (50%). This unit is a task set and marked by the exam board, completed in examination conditions within a fixed examination window. Learners study the design, creation, testing and evaluation of a relational database system to manage information.

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| Year 12 BTEC ICT | Autumn 1 | Autumn 2 |
| | • Social media websites<br>• Business use of social media<br>• Unit 3 Assignment part A | • Posting Schedules<br>• Preparing Content<br>• Analysing social media usage |
| | Spring 1 | Spring 2 |
| | • Unit 3 Assignment part B and C<br>• Introduction to databases | • Database skills<br>• Practice database exams |
| | Summer 1 | Summer 2 |
| | • Unit 2 exam prep<br>• Unit 2 exam | • Extended certificate introduction |

## Y13 - ICT (Applied) Single Award AS & A Level (Edexcel)

Applied ICT is a 'must have' for every post-sixteen student. Highly motivating, it develops the knowledge and skills students need to be competent and informed ICT users and practitioners.

What topics will I study?

A Level (Year 13)

1. Unit 7 – Using Database Software (practical assessment)
2. Unit 8 – Managing ICT Projects (portfolio)
3. Unit 10 – Using Multimedia Software (portfolio)

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| Year 13 | Autumn 1 | Autumn 2 |
| | • Analysis<br>• Website Creation<br>• Project Management. | • Project Management<br>• Design Documentation<br>• Multimedia product development with Flash |
| | Spring 1 | Spring 2 |
| | • Multimedia product development with Flash<br>• Project Management.<br>• Testing Documentation | • Evaluation<br>• Exam prep - Relational databases. |
| | Summer 1 | Summer 2 |
| | • Exam prep - Relational databases. | • Exams. |

**For further advice or to find out more about the Computing and ICT curriculum at Idsall School, please contact Mr N Barnett.**