

**Pre-course information – Computer Science**

**Computer Science**

Computer Science is engaging and practical, encouraging creativity and problem solving. It encourages students to develop their understanding and application of the core concepts in computer science. Students also analyse problems in computational terms and devise creative solutions by designing, writing, testing and evaluating programs.

**Professional Association:**

[Computing at School](https://www.computingatschool.org.uk/) - Provides teaching resources and a community of computing teachers.

[Teach Computing](https://teachcomputing.org/) - Offers trainee and experienced teachers:

* courses and accreditation
* bursaries for training
* free curriculum teaching resources
* community support and more

Membership is free for both sites and becoming a member allows you to join the forums and community events hosted by various regional hub schools

**Computer Science Subject Knowledge**

Invest time in ensuring that you are confident in your personal knowledge and understanding to prepare you to teach Computer Science in the National Curriculum. Go through a GCSE subject revision guide, a GCSE text book or the resources on the exam board website for your own subject to get a flavour of the level required.

**Exam boards:**

The OCR GCSE Computer Science Specification can be found [here](https://www.ocr.org.uk/qualifications/gcse/computer-science-j277-from-2020/)

The AQA GCSE Computer Science Specification can be found [here](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8520)

**Examination specification link past papers:**

Take a look at some previous exam papers along with their respective mark schemes. Have a go at the papers and review your answers as Green (easy), Amber (needs a bit of work) and Red (help!)

[OCR Computer Science Past Papers](https://www.ocr.org.uk/qualifications/gcse/computer-science-j276-from-2016/assessment/)

[AQA Computer Science Past Papers](https://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-8520/assessment-resources)

**Recommended reading, books, journals that are subject specific:**

Familiarise yourself with the National Curriculum for Key Stages 1-4 (i.e. up to GCSE): <https://www.gov.uk/government/collections/national-curriculum>

And the programme of study for science for Key Stages 1-4: <https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study>

* *Python Programming (Third Edition) (For the Absolute Beginner) – Mike Dawson*. If you are new to programming with Python and are looking for a solid introduction, this is the book for you. Developed by computer science instructors, books in the ""for the absolute beginner"" series teach the principles of programming through simple game creation.
* *Algorithms to Live By: The Computer Science of Human Decisions – Brian Christian & Tom Griffiths*. The authors show us how the simple, precise algorithms used by computers can also untangle very human questions. Modern life is constrained by limited space and time, limits that give rise to a particular set of problems. What should we do, or leave undone, in a day or a lifetime? How much messiness should we accept? The authors explain how to have better hunches and when to leave things to chance, how to deal with overwhelming choices and how best to connect with others.
* *Teaching Computing (Developing as a Reflective Secondary Teacher) – Carl Simmons*. Previously known as Teaching ICT, this second edition has been carefully revised to meet the new demands of computer science as a curriculum subject. With a clear focus on the theory and practice that supports high quality teaching, this textbook provides pragmatic guidance on how to plan, teach, manage and assess computer science teaching.
* *Teaching Computing in Secondary Schools: A Practical Handbook – William Lau*. This book provides a step-by-step guide to teaching computing at secondary level. It offers an entire framework for planning and delivering the curriculum and shows you how to create a supportive environment for students in which all can enjoy computing. The focus throughout is on giving students the opportunity to think, program, build and create with confidence and imagination, transforming them from users to creators of technology.

**On wider issues in education:**

* *Mark. Plan. Teach.: Save time. Reduce workload. Impact learning - Ross Morrison McGill.* There are three things that every teacher must do: mark work, plan lessons and teach students well. This brand new book from Ross Morrison McGill, bestselling author of 100 Ideas for Secondary Teachers: Outstanding Lessons and Teacher Toolkit, is packed full of practical ideas that will help teachers refine the key elements of their profession
* *The Teacher's Toolkit: Raise Classroom Achievement with Strategies for Every Learner – Paul Ginnis*. Packed with practical classroom strategies this teacher's resource will enable you to: - meet the needs of different learning styles - stimulate your own creativity - add spice to your teaching - challenge the gifted - and the disruptive! Whatever subject you teach, this comprehensive volume will help you to develop thinking skills in your students; promote citizenship and an understanding of democracy; fine-tune study skills and help students acquire the attitude and skills for true independence