GCSE Computer Science

Why study Computer Science

You have grown up in a world where technology is evolving rapidly, creating new subject areas to explore and changing the way people work in every area from medicine and fashion to engineering and economics. So whatever your career plans, you know it's vital to develop your grasp of these ideas and concepts that will shape your world.

That's why we now offer two new routes into Year 10 and beyond. On the one hand, we offer Cambridge National iMedia, where students explore creative technologies from industry and business and apply their skills to make digital graphics, animations and apps. And on the other hand, we offer GCSE Computer Science, where students delve deeper into the theoretical side of these technologies, while developing skills in problem solving and programming.

So for Cambridge Nationals in iMedia, think 'creative industries & applied skills'. And for Computer Science, think 'theory & programming'.

In a nutshell, GCSE Computer Science explores the principles of digital technology and way of working that's called 'computational thinking', with coding as a core of the course. You've got to be able to think logically, solve puzzles and be tenacious when the going gets tough. But it is also really creative and you'll get a real buzz out of getting something to work yourself, especially when programming.

So if you enjoyed Scratch in previous years or game design then you might find computing is for you. Before you can do the complicated stuff you need to master the basics. Making a computer dance to your tune is a really creative thing - but let's not pretend it's easy. Computer Science will make you think. It will stretch you and test your powers of logic and patience. It might even drive you a bit crazy at times. In short, Computer Science is serious fun!

What will you be learning?

There are three units:

- **Comp 1** is called 'Computer Systems'. This is where you begin to get beneath the surface of how computers work and communicate with each other. For example, you'll learn about the principles on which a processor operates and how it interacts with memory. You will learn how computer networks work and the technology behind them, as well as the relevant security issues.

  It's all assessed by a written 1 hour 30 minutes exam worth 40% of the total grade.

- **Comp 2** is called 'Computational Thinking, Algorithms and Programming'. This unit is focused on the core of computer science and the application of computer science principles. You will also learn how data is represented in binary to understand how a computer works.

  Again, it's all assessed by a written 1 hour 30 minutes exam worth 40% of the total grade – some of the questions will ask you to write some simple code!

- **Comp 3** is the programming project. A series of practical projects, each involving 3 tasks that get harder as you move up the levels. Don't worry if you have never programmed before – we don't expect you to have. The whole point of these projects is to build up your confidence and skills so that, by the end of the course, you might want to go on and do the real 'pro' programming we do at A level.

  It's worth 20% of the final mark and is a Controlled Assessment completed in lessons.

What are lessons like?

Busy but fun! You'll learn loads of new stuff, combining the 'theory' with lots of practical tasks and challenges. So there'll be lots of practical work on the computers, skills building, learning to program, doing the projects and conducting tests and experiments for your research. But there'll also be quite a bit of extra reading and exercises to sharpen your thinking skills.

What can it lead to?

It's no exaggeration to say the world runs on computers. They are everywhere: in homes, schools and offices but not just in the way you think. They are also embedded in all sorts of machines. Computers control airplanes, manage chemical plants, send rockets to space, control the central heating and make sure your Mum's car runs efficiently. As new things are developed, the world needs more and more people to research new ways of using computers to do the things they want.

GCSE Computer Science is a great foundation for going on to do Computer Science at A level. And Computer Science at A level is a great foundation for going on to study Computer Science at University. And that can open up a lot of possibilities!

But you don't have to want to go on to be a computer scientist to do this course – you might just be curious about learning a bit more. That's why we are offering it. The skills you learn will be of enormous benefit in lots of your other subjects. Nicholas Negroponte – a famous man whose 'One Laptop per Child' project is trying to get computers to children in the developing world once said, *"Computer programming is a powerful tool for children to 'learn learning,' that is, to learn the skills of thinking and problem-solving… Children who engage in programming transfer that kind of learning to other things."*

Want to know more?

If you've got any questions come and have a chat with Mrs Chambers or Mr McNulty

LUNESDALE LEARNING TRUST