Computer Science

The Super Curriculum

The Super Curriculum

Super curricular activities are those that take your regular curriculum *further*. They take the subjects you study in the classroom *beyond* that which your teacher has taught you or what you've done for home learning. For example, you may go into more depth on something you picked up in the classroom, or learn about a new topic altogether.

These activities are normally in the form of extra reading but they can take many other forms, like watching videos online, downloading podcasts, attending lectures, visiting museums or entering academic competitions.

Engaging in super curricular activities will help you develop a love for your favourite subject or subjects. In this booklet, there are a range of activities, suggested by your teachers. They are by no means exhaustive lists but should get you started. I would encourage you to share ideas and opportunities you come across with your teachers so that, over time, the recommended activities in this booklet can grow.

In the future, employers or universities will be interested to hear about what super curricular activities you have engaged in; they will be interested in what you have learnt and impressed by your efforts.

I wish you well in your pursuit of super curricular activities!

Dr Caroline Creaby
Deputy Headteacher: Curriculum

Super Curriculum – Year 7, 8 & 9
Subject: COMPUTER SCIENCE

📖 **Computational Fairy Tales by Jeremy Kubica** A romp through the principles of computational thinking, illustrating high-level computer science concepts, the motivation behind them, and their application.	📖 **Algorithms to Live By: The Computer Science of Human Decisions** A fascinating exploration of how computer algorithms can be applied to our everyday lives.	🔍 **Where could Computer Science take you?** Carry out some research to find out about some unusual careers with the tech and Compute Science industry. Digital locksmith? Drone operator? Professional hacker?
👁 **Map of Computer Science:** A fantastic short video summarising the field of computer science. https://www.youtube.com/watch?v=SzJ46YA_RaA	👁 **BBC Click:** Watch this weekly BBC television programme covering news and recent developments in the world of consumer technology and innovations. http://www.bbc.co.uk/programmes/b006m9ry/episodes/player	👁 **Where it all started:** Watch the TedTalk on The birth of the computer. | George Dyson https://www.youtube.com/watch?v=EF692dBzWAs&index=1&list=PLF7032F8EB1A4F9E2
📝 **No more teachers –** Write a short essay debating the following question - *Will computer assisted education replace the need for teachers in the future?*	✂ **The year 2100**– Imagine that it is the year 2100. *What will the world be like? How will technology have changed? What new inventions will have been created?* Sketch a picture of a large city giving a perspective on what you think the world will be like in 2100.	📝 **Intelligent Machines –** Write a short essay debating the following question – *Are computers more intelligent than the people who make them?*
💡 **Animation18 –** Using software of your choice, create a one-minute animation about cybersecurity threats and staying safe online. You could enter your creation into this competition - https://brilliant.org/courses/computer-science-fundamentals/	💡 **Computer Science Fundamentals -** A collection of interactive quizzes that will help you master computer science fundamentals. https://brilliant.org/courses/computer-science-fundamentals/	💡 **Raspberry Pi –** *Why not get yourself a credit card sized computer?* There are so many projects you can complete with this tiny computer. Take a look here for inspiration. https://raspberrypi.org/magpi-issues/Projects_Book_v1.pdf
💡 **Create your own website -** Use this Codeacademy tutorial to develop your skills using HTML and CSS to build you own website. https://www.codecademy.com/courses/web-beginner-en-HZA3b/0/1	💡 **Python -** Develop your Python programming skills by challenging yourself to complete as many tasks on Snakify as you can. https://snakify.org/	📍 **Centre of Computing History -** Plan a visit to the Centre of Computing History Rene Court, Coldhams Road, Cambridge, CB1 3EW http://www.computinghistory.org.uk/

📖	Reading task	📝	Writing task
👂	Listening task	👁	Watching task
🔍	Research task	📍	Trip or visit
✂	Creative task	💡	Student-led task

Super Curriculum – Year 10 & 11
Subject: COMPUTER SCIENCE

📖 **The Register:** The Register (nicknamed El Reg) is a British technology news and opinion website. Keep up to date by subscribing and reading news articles regularly. https://www.theregister.co.uk/	📖 **The Pattern on the Stone: The Simple Ideas That Make Computers Work by Daniel Hillis** A short but interesting read explaining the basic concepts of the computer in everyday language.	📖 **The GCHQ Puzzle Book:** *Why not pit your wits against the people who cracked the Enigma?* This book will have you scratching your head for hours trying to solve some challenging problems.
📖 **The questions computers have never answered:** There are still some problems which computers and their designers are yet to solve. But what are they? https://www.wired.com/2014/02/halting-problem/	📖 **Algorithms to Live By: The Computer Science of Human Decisions** A fascinating exploration of how computer algorithms can be applied to our everyday lives.	👁 **Making all knowledge computational:** Watch the TedTalk on Computing a theory of everything | Stephen Wolfram https://www.youtube.com/watch?v=60P7717-XOQ&index=5&list=PLF7032F8EB1A4F9E2
👁 **BBC Click:** Watch this weekly BBC television programme covering news and recent developments in the world of consumer technology and innovations. http://www.bbc.co.uk/programmes/b006m9ry/episodes/player	👂 **The story of computing:** This Guardian blog talks about the Computing universe and the evolution of computers. https://www.theguardian.com/science/audio/2015/jan/30/computing-universe-science-weekly-podcast	🔍 **The Internet of Things:** Probably the most pervasive trend is the Web of Things, where just about everything we interact with becomes a computable entity. Research how future developments in this area may change or revolutionise our lives even further.
📝 **Artificial Intelligence –** Write a short essay debating the following question - *Will Artificial Intelligence Replace Mankind?*	💡 **CyberFirst –** Get hands on with Cyber Security course run by GCHQ. They offer a variety of residential and non-residential courses. https://www.gchq-careers.co.uk/early-careers/cyberfirst.html	💡 **Build your own –** *Looking to purchase a new computer or laptop?* Well, instead your challenge is to build your own! Purchase components separately to piece together in creating your own system.
💡 **SQL -** Use these Khan Academy tutorials to learn how to use SQL to store, query, and manipulate data. https://www.khanacademy.org/computing/computer-programming/sql	💡 **Python -** Develop your Python programming skills by challenging yourself to complete as many tasks on Snakify as you can. https://snakify.org/	📍 **Bletchley Park -** Plan a visit to the home of codebreaking at Bletchley Park – The Mansion, Bletchley Park, Sherwood Drive, Bletchley, Milton Keynes, MK3 6EB https://bletchleypark.org.uk/

📖	Reading task	📝	Writing task
👂	Listening task	👁	Watching task
🔍	Research task	📍	Trip or visit
✂	Creative task	💡	Student-led task

Super Curriculum – Year 12 & 13
Subject: COMPUTER SCIENCE

📖 **The Register:** The Register (nicknamed El Reg) is a British technology news and opinion website. Keep up to date by subscribing and reading news articles regularly. https://www.theregister.co.uk/	📖 **Algorithmic Puzzles by Anany Levitin and Maria Levitin** The emphasis lies in training the reader to think algorithmically and develop new puzzle-solving skills.	📖 **How Google works by Eric Schmidt and Jonathan Rosenberg** How Google Works shines a light on the hiring and operating processes of Google, which have enabled it to come up with great products continuously and stay visionary over the past 17 years.
📖 **Algorithms to Live By: The Computer Science of Human Decisions** A fascinating exploration of how computer algorithms can be applied to our everyday lives.	👁 **Mysteries of the mind can be solved:** A brain in a supercomputer | Henry Markram https://www.youtube.com/watch?v=LS3wMC2BpxU&index=10&list=PLF7032F8EB1A4F9E2	👁 **Big Data:** Watch the TedTalk on The year open data went worldwide | Tim Berners-Lee https://www.youtube.com/watch?v=3YcZ3Zqk0a8&list=PLF7032F8EB1A4F9E2&index=20
👁 **AI at MIT:** Take a look at this fascinating series of lectures on Artificial Intelligence by Patrick Winston at MIT. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-034-artificial-intelligence-fall-2010/lecture-videos/lecture-7-constraints-interpreting-line-drawings/	🔍 **No Touch Interfaces:** Forbes ranks no touch interfaces within the top five trends that will drive the future of technology. What can you find out about no touch interfaces? How may they benefit future technological developments?	🔍 **P versus NP problem:** This is a major unsolved problem in Computer Science. If the solution to a problem is easy to check for correctness, is the problem easy to solve? What do you know about P vs NP? Do you think this problem will ever be solved?
📝 **Quantum Computing:** Shor's Algorithm focusses on quickly factorising numbers into primes. Write a short essay summarising how the birth of quantum computing allowed for efficient integer factorisation.	👂 **Spark:** Spark is an ongoing conversation about our rapidly changing world. Along with you, host Nora Young explores how technology, innovation and design affects our lives. http://www.cbc.ca/radio/spark	👂 **Programming Throwdown:** Programming Throwdown offers a general introduction to a wide range of programming-related topics in an interesting and engaging manner http://www.programmingthrowdown.com/
💡 **Advanced JavaScript -** Use these Khan Academy to combine JS, and mathematical concepts to simulate nature in your programs https://www.khanacademy.org/computing/computer-programming/programming-natural-simulations l	💡 **Project Euler -** Test your problem solving and computational thinking skills through a series of challenging mathematical/computer programming problems http://projecteuler.net./	📍 **The National Museum of Computing -** Plan a visit to The National Museum of Computing - Bletchley Park MILTON KEYNES MK3 6EB http://www.tnmoc.org/

📖	Reading task	📝	Writing task
👂	Listening task	👁	Watching task
🔍	Research task	📍	Trip or visit
✂	Creative task	💡	Student-led task

Sandringham School

'Everybody can be Somebody'