Computer Science Super Curriculum KS3

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?
Bebras Check out some of the brilliant computational thinking challenges and develop your problem solving skills at http://www.bebras.uk/	**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/magpiissues/Projects_Book_v1.pdf
Create your own website Use this Codeacademy tutorial to develop your skills using HTML and CSS to build your own website. https://www.codecademy.com/courses/web-beginner-enHZA3b/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		Creative Task
	Research Task		Writing Task
	Watching Task		Student – Led Task
	Listening Task		Trip or Visit

Computer Science Super Curriculum KS4

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=PLF7032F8 EB1A4F9E2
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-weeklypodcast	**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 revolution
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.gchqcareers.co.uk/earlycareers/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/computerprogramming/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/
Perscoding Put together a team and take on other year 7-11 students across this country in some really challenging coding tasks! https://persecoding.net/about/	**CyberDiscovery** Take part in the callenges offered at CyberDiscovery to see if you have what it takes to be a cyber security expert! https://www.joincyberdiscovery.com/	**RenderMan** Why not download the software that Pixar uses to make award winning films and take part in the online course in collaboration with Khan Academy! https://www.khanacademy.org/partner-content/pixar

Computer Science Super Curriculum KS5

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 BernersLee 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/electr ical-engineering-and-computer science/6-034-artificialintelligence-fall-2010/lecturevideos/lecture-7-constraintsinterpreting-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. programmingthrowdo wn.com/
Advanced JavaScript Use these Khan Academy to combine JS, and mathematical concepts to simulate nature in your programs https://www.khanacademy.org/co mputing/computerprogramming/ programmingnatural-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/
MOOCs Why not take one of the many online courses delivered by some of the best teachers/schools to further your Computing Skills. Topics range from AI to security to big data. Some courses can even count as credits towards a degree! Check out the list at http://learnict.it/great-moocs-for-a-level-students/	**Computational Thinking to Solve Problems!** Have a look at this great Ted Talk! Try to brainstorm and write up and idea of a problem that you think can be solved with Computer Science. https://youtu.be/-Ht4qiDRZE8	**Machine learning** Research the limits of machine learning and what the future holds? Will machines take our jobs? Why did Elon Musk and Mark Zuckerberg have a public spat about it? Why is Google investing so heavily in it? Check out where Google is taking it next https://youtu.be/gmWIf5sINEc