Computer Science Enrichment Activities

In addition to the Summer Work that you will be expected to complete ahead of September, here are a few activities you can do to prepare for Computer Science A-Level and extend your interest and knowledge in the subject.

Books

- Computational Fairy Tales by Jeremy Kubica. ISBN: 978-1477550298 tale.
- Artificial Intelligence: A Ladybird Expert Book by Michael Wooldridge. ISBN: 978-0718188757
- Once Upon an Algorithm: How Stories Explain Computing by Martin Erwig. ISBN: 978-0262036634.
- Computer Science: An Overview by J. Glenn Brookshear. ISBN: 978-0321544285.
- Code: The Hidden Language of Computer Hardware and Software by Charles Petzold. ISBN: 978-0735611313
- Out of Their Minds by D Shasha and Cathy Lazere. ISBN: 978-3540979920.
- The Pattern on the Stone: The Simple Ideas That Make Computers Work by Daniel Hillis. ISBN: 978-0465025961
- The Information: A History, a Theory, a Flood by James Gleick. ISBN: 978-0007225736
- Outnumbered: From Facebook and Google to fake news and filter-bubbles – the algorithms that control our lives by David Sumpter. ISBN: 978-1472947413.
- AI: Its Nature and Future by Margaret A Boden. ISBN: 978-0198777984.
- The Pleasures of Counting by Tom Kôrner. ISBN: 978-0521568234 - puts Maths into the context of how it is used to solve real-world problems.
- The Code Book by Simon Singh. ISBN: 978-1857028898
- Closing the Gap: The Quest to Understand Prime Numbers by Vicky Neale. ISBN: 978-0198788287.
- Algorithmic Puzzles by Anany Levitin and Maria Levitin. ISBN: 978-0199740444
- The New Turing Omnibus by A Kee Dewdney. ISBN: 978-0805071665

Practical activities

- You may like to look at our GeomLab website which will introduce you to some of the most important ideas in computer programming in an interactive, visual way through a guided activity.
- The Turtle system is a graphics programming environment designed to provide an enjoyable introduction to programming in Java syntax, together with a practical insight into fundamental concepts of computer science such as compilation and machine code.
- The Alice system from Carnegie Mellon University provides a point-and-click environment for designing 3-D animations and is a useful introduction to object-oriented programming.

- Elizabeth is an automated conversation and natural language processing program that provides an enjoyable introduction to natural language processing, and that can give insights into some of the fundamental methods and issues of artificial intelligence within an entertaining context.
- CodeAcademy provides a fun introduction to programming.
- Young Rewired State is a series of collaborative hacking events for under 18s. It brings together young developers to build web and mobile applications that attempt to solve real world problems.
- Project Euler is a series of challenging mathematical/computer programming problems.
- Female prospective students might be interested in the work of the National Centre for Women and Information Technology.
- The British Informatics Olympiad is a national computer programming competition for British Schools and colleges.
- Cyber Discovery – an extracurricular cyber security learning programme for Y10–13 students from across England.

Films

- **Hackers**: Hackers is a classic for rebellious computer science students. The hero of the story is arrested for writing a computer virus as a teen, and as an adult later works with his friends to take down a plot to release a dangerous computer virus.
- **Wargames**: Oops! An unsuspecting computer prodigy accidentally starts World War III when he hacks into a military computer to play a war game.
- **The Matrix**: Most computer programmers live a pretty typical life, but Neo finds out that his reality is in fact not a reality at all, and rather a computerised artificial world. Neo offers inspiration to all who care about the importance of real human life over virtual reality.
- **Tron**: Have you ever felt trapped by your computer? In this movie, a hacker actually is, and has to overcome a program that holds him captive.
- **Jumpin Jack Flash**: When people think about computer science, Whoopi Goldberg probably doesn't immediately come to mind. But Whoopi's role in Jumpin Jack Flash shows how unintentionally dangerous computer users can be.
- **Ghost in the Shell**: An animated movie from Japan, Ghost in the Shell tells the story of a well-connected future set in 2029 full of hackers and the cyborgs that prevent them.

Online Courses

- https://www.edx.org/course/subject/computer-science
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