Landau Learner Curriculum Overview

Subject: Computer Science **Director of Learning: SDC Year: 13**

Curriculum organisation				
Students are taught in mixed ability for the equivalent of six single lessons per fortnight. These sessions are split between 2 staff 3:2 split between SDC and IA				
What topics will students be studying this year? Includes links to National Curriculum, Curriculum Intent and Prior Related Learning*				
Term 1:	**Term 2:**	**Term 3:**	**Term 4:**	**Term 5:**
• Computer Science Project Design and Analysis • Computer Science Project Implementation and testing • Algorithms	• Computer Science Project Implementation and Testing • Computer Science Project Evaluation	• Pipelining • Programming Language Translators • Graphical Processing Units • Object Oriented Programming • Compression, Encryption and Hashing	• Normalisation • Network Security and Threats • Floating point arithmetic • Structured Query Language • Peer to Peer vs Client Server	• Systems Hardware - Components of the CPU application to the Fetch – Decode - Execute cycle. • Social, Moral and ethical implications of computing on society • Programming - Development of skills
Prior learning: Programming Y7 T1, T3, Y8 T1, Y9 T1, 2, 3, 4 Y10 T1, Y11 T1,2,3,4,5. Computational thinking Y7 T5. Y9 T1, 2,3,4,5 Y10 T1, 3, 4, 5 Y11 T1, 2,3,4,5. **A Level Specification:** Develop: • An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation • The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so • The capacity to think creatively, innovatively, analytically, logically and critically • The capacity to see relationships between different aspects of computer science • Mathematical skills. **Curriculum Intent:** This enables students develop their programming understanding and application to program and game development process that would be used in industry. This develops their digital literacy and starts them on the mind-set of a computer scientist.	**Prior learning**: Programming Y7 T1, T3, Y8 T1, Y9 T1, 2, 3, 4 Y10 T1, Y11 T1,2,3,4,5. Computational thinking Y7 T5. Y9 T1, 2,3,4,5 Y10 T1, 3, 4, 5 Y11 T1, 2,3,4,5. **A Level Specification:** Develop: • An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation • The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so • The capacity to think creatively, innovatively, analytically, logically and critically • The capacity to see relationships between different aspects of computer science • Mathematical skills. **Curriculum Intent:** This enables students develop their programming understanding and application to program and game development process that would be used in industry. This develops their digital literacy and starts them on the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system when storing the data items.	**Prior learning**: Programming Y7 T1, T3, Y8 T1, Y9 T1, 2, 3, 4 Y10 T1, Y11 T1,2,3,4,5. Computational thinking Y7 T5. Y9 T1, 2,3,4,5 Y10 T1, 3, 4, 5 Y11 T1, 2,3,4,5. Systems Architecture Y10 T3 Y11 T1 Y12 T1 **A Level Specification:** Develop: • An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation • The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so • The capacity to think creatively, innovatively, analytically, logically and critically • The capacity to see relationships between different aspects of computer science • Mathematical skills. **Curriculum Intent:** This enables students develop their programming understanding and application to program and game development process that would be used in industry. This develops their digital literacy and starts them on the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system developing the knowledge of what happens when processing instructions.	**Prior learning**: Programming Y7 T1, T3, Y8 T1, Y9 T1, 2, 3, 4 Y10 T1, Y11 T1,2,3,4,5. Computational thinking Y7 T5. Y9 T1, 2,3,4,5 Y10 T1, 3, 4, 5 Y11 T1, 2,3,4,5. Logic Y9 T2, Y10 T3 Data types Y9 T2 Y10 T3 Y12 T4 **A Level Specification:** Develop: • An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation • The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so • The capacity to think creatively, innovatively, analytically, logically and critically • The capacity to see relationships between different aspects of computer science • Mathematical skills. **Curriculum Intent:** This enables students develop their programming understanding and application to program and game development process that would be used in industry. This develops their digital literacy and starts them on the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system developing the knowledge of what happens when processing instructions.	**Prior learning**: Programming Y7 T1, T3, Y8 T1, Y9 T1, 2, 3, 4 Y10 T1, Y11 T1,2,3,4,5. Computational thinking Y7 T5. Y9 T1, 2,3,4,5 Y10 T1, 3, 4, 5 Y11 T1, 2,3,4,5. Systems Architecture Y10 T3 Y11 T1 Y12 T1, 3 **A Level Specification:** Develop: • An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation • The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so • The capacity to think creatively, innovatively, analytically, logically and critically • The capacity to see relationships between different aspects of computer science • Mathematical skills. **Curriculum Intent:** This enables students to develop a holistic application of how computing impacts on their wider life. In the largest growing sector computing is applied to a number of now ethical and moral dilemmas in the real world. This enables students to develop a breadth of understanding of the digital world and how this contributed to a digital society.

Equipment needed for sessions:	**What can you do to support your child?**
• Cambridge Elevate Textbook (Provided by College) • Computer Science Exercise book (IA/SDC) • Computer and internet access (provided by College) • Lesson resources (Digital and physical provided by the learning tutor)	• Encourage your student to engage with their homework and complete it on time and to a high standard, asking them to show you the finished work. • Take an interest in what you child is learning. • Talk to them about Computing in the real world • Encourage them to watch television shows, documentaries and films that include computer science and developing technology.
How will learning be assessed and progress measured?	**Extension and enrichment activities:**
• End of Topic assessment • Marking of written and practical work is carried out on a regular basis in line with the College policy • End of year summative assessment. • Regular peer and self-marking.	• Volunteer to be a CHIP mentor/ Support in KS3 and KS4 Sessions and /or Coding Club • Robotics and Coding Club (Thursday with IA) • The National Museum of Computing/Bletchley Park/ Manchester's Museum of Science & industry • At-Bristol Science Centre / National Space Centre The Science Museum / National Media Museum/ Jodrell Bank/ Leicester Retro Computer Museum