# Landau Learner Curriculum Overview

**Subject: Computer Science** **Director of Learning: SDC Year: 12**

| **Curriculum organisation** | | | | |
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| 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:** |
| • Components of a computer<br>• Computational Thinking<br>• System Software Functions | • Software Development<br>• Problem Solving<br>• Compression Encryption and Hashing | • Database Concepts<br>• Algorithms, Searching and Sorting | • Internet Communications<br>• Primitive Data Types, Binary and Hexadecimal<br>• Object Oriented Programming<br>• Data Structures<br>• Programming – HTML, CSS & Javascript | • Data Structures<br>• Logic Gates<br>• Karnaugh Maps<br>• Ethical, Moral, Environmental and Legal implications of computing<br>• Python Project Programming |
| **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. Memory Y10 T3, 4 Y11 T1,2 Systems Architecture Y10 T3 Y11 T1<br>**A Level Specification:**<br>Develop:<br>• An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation<br>• The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so<br>• The capacity to think creatively, innovatively, analytically, logically and critically<br>• The capacity to see relationships between different aspects of computer science<br>• Mathematical skills.<br>**Curriculum Intent:**<br>This enables students develop their programming understanding and application to program that would be used in industry. This develops their digital literacy and develops the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system. | **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 Data representation Y9 T3, Y11 T4<br>**A Level Specification:**<br>Develop:<br>• An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation<br>• The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so<br>• The capacity to think creatively, innovatively, analytically, logically and critically<br>• The capacity to see relationships between different aspects of computer science<br>• Mathematical skills.<br>**Curriculum Intent:**<br>This enables students develop their programming understanding and application to program that would be used in industry. This develops their digital literacy and develops the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system. | **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<br>**A Level Specification:**<br>Develop:<br>• An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation<br>• The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so<br>• The capacity to think creatively, innovatively, analytically, logically and critically<br>• The capacity to see relationships between different aspects of computer science<br>• Mathematical skills.<br>**Curriculum Intent:**<br>This enables students develop their programming understanding and application to program that would be used in industry. This develops their digital literacy and develops the mind-set of a computer scientist. Additionally, this allows them to understand at greater depth how the computer works as a whole system. | **Prior learning**: Programming Y7 T1, T3, Y8 T1,3,5, 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 Data types Y9 T2 Y10 T3<br>**A Level Specification:**<br>Develop:<br>• An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation<br>• The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so<br>• The capacity to think creatively, innovatively, analytically, logically and critically<br>• The capacity to see relationships between different aspects of computer science<br>• Mathematical skills.<br>**Curriculum Intent:**<br>This enables students develop their programming understanding and application to program that would be used in industry. This develops their digital literacy and develops 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<br>**A Level Specification:**<br>Develop:<br>• An understanding and ability to apply the fundamental principles and concepts of computer science, including: abstraction, decomposition, logic, algorithms and data representation<br>• The ability to analyse problems in computational terms through practical experience of solving such problems, including writing programs to do so<br>• The capacity to think creatively, innovatively, analytically, logically and critically<br>• The capacity to see relationships between different aspects of computer science<br>• Mathematical skills.<br>**Curriculum Intent:**<br>This enables students develop their programming understanding and application to program that would be used in industry. 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| **Equipment needed for sessions:** | **What can you do to support your child?** |
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| • Cambridge Elevate Textbook (Provided by College)<br>• Computer Science Exercise book (IA/SDC)<br>• Computer and internet access (provided by College)<br>• 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.<br>• Take an interest in what you child is learning and talk to them about Computing in the real world<br>• 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<br>• Marking of written and practical work is carried out on a regular basis in line with the College policy<br>• End of year summative assessment.<br>• Regular peer and self-marking. | • Robotics and Coding Club (Thursday with IA)<br>• The National Museum of Computing/Bletchley Park/ Manchester's Museum of Science & industry<br>• At-Bristol Science Centre / National Space Centre<br>• The Science Museum / National Media Museum/ Jodrell Bank<br>• Leicester Retro Computer Museum |