COMPUTER SCIENCE

This is the A level specification. We will be following the new Cambridge International 9618 specification. Familiarise yourself with the content of the learner guide.

There is no requirement for you to have previously studies Computer Science at GCSE, however you will benefit from independent study to gain a beginner's level of programming proficiency. This should be the main focus of your summer preparation.

Tasks to Try

1. Enhance your current understanding of Python beyond basic procedural programming, with practical experience and investigating Object Oriented design. This is our primary programming language and design methodology for A Level.

Beginner or just in need of a refresher: Then work through the quick start guide.

You may need to install a Python IDE (Integrated Development Environment) such as IDLE, Thonny or PyCharm, which are freely available to download for Windows or Mac OS X.

More advanced preparation: Develop an understanding of the concepts of Object-Oriented programming. This online course would make an excellent starting point.
By the end of the course, you'll be able to...

- Explore using objects in programming and understand the difference between a function and an object.
- Develop your understanding of how writing your own class which allows you to combine functions and data.
- Demonstrate extending other people's classes, including the concepts of inheritance and polymorphism.
- Produce a module to apply your learning of Object-Oriented programming.

When following tutorials; have a means of taking notes to-hand, that you will be able to refer back to next year. This could be in the form of a journal, in chronological order, or divided up into topics.
Add a glossary to your notes, covering the key terms used in Object Oriented programming.

2. "W3 Schools" provides tutorials and quizzes for a range of web development languages. Try their [Python quiz](#).

3. ["Isaac Computer Science"](#) offers a wealth of online theory and programming resources including GCSE to A level transition material covering:

   - Programming concepts
   - Data representation
   - Boolean logic
   - Systems
   - Networking

4. Research topic: *"Will AI Improve the Quality of People's Lives?*
   Investigate the potential impact of Artificial Intelligence (AI) on enhancing the quality of people's lives, by examining real-world examples and considering ethical concerns. Create a written report which provides a comprehensive evaluation of the role of AI in improving the overall well-being and quality of life for individuals and communities. Develop your own answers to the following questions:

   - What is Artificial Intelligence, and what are its current capabilities and limitations?
   - What are the potential effects of AI on employment and the workforce, considering automation and job displacement?
   - How does AI contribute to improving social interactions and communication?
   - What ethical considerations arise from the integration of AI in various aspects of people's lives?
   - What are the potential risks and challenges associated with widespread AI adoption?

Please note: Your report must reference all sources of information, with at least two different credible sources of scientific research for each area of research.

Links:
Learner Guide: https://learning.cambridgeinternational.org/classroom/course/view.php?id=3698

Python Get Started: https://www.python.org/about/gettingstarted/

Advanced online course: https://www.futurelearn.com/courses/object-oriented-principles

W3 Schools Python Quiz: https://www.w3schools.com/quiztest/quiztest.asp?qtest=PYTHON

Isaac Computer Science: https://isaaccomputerscience.org/topics

Cambridge International 9618 specification:
https://www.cambridgeinternational.org/Images/721397-2027-2029-syllabus.pdf