



PREPARING FOR A-LEVEL

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](#).

Here are a set of tasks. Task 1 is the most important. The other tasks can be completed in any order and you do not need to complete them all.

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. The way to learn programming is to try a piece of code, make mistakes and try again. Simply reading text is not enough.

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 or Wing IDE, 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](#). Explore alternative scripting languages, such as [Javascript](#).
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. 3D Virtual tour: Visit two early computing galleries at [The National Museum of Computing](#) on Bletchley Park. Move around the galleries looking at the machines and their descriptions with the added bonus of hyperlinks to video and text explanations providing further detail and history of the exhibits.

Write a 500 word summary of the visit. Describe the advantages and disadvantages of a virtual tour, opposed to visiting in person.

5. Present a discussion on the benefits and limitations of Virtual Reality:
 - a. In business contexts, such as medicine
 - b. As a gaming tool
 - c. As an extension to social media. Present your work in the form of a pod cast.
6. Research topic: *Social, legal and cultural issues*. Develop your own answers to the following questions:
 - "*Social networking sites improve the quality of people's lives.*" Produce an 800 word essay which provides balanced arguments for and against this statement. Support your arguments with evidence of research and a discussion you have had with a friend or family member. Draw conclusions from your evidence and finally present your own opinions.
 - Are there laws against Internet trolls, cyberbullying and hate sites? Discuss the challenges facing legislators and law enforcers.
 - Government security agencies need strong encryption algorithms to keep their communications secure. Explain why some governments, have made it illegal to use strong encryption. Do you think the UK should ban strong encryption? Give reasons for your answer.
7. Create a timeline showing the history of computing, including any key discoveries or inventions. Extend your timeline to show how you think computer science might develop over the next 50 years.
8. Compare the Xbox ONE, PS4 Pro and PC as gaming platforms. You must use as much technical detail as possible and reference any evidence presented. Choose how you will present your ideas creatively.