

GCSE to A LEVEL

Summer Project

Name:

Subject: A Level Computer Science

The purpose of this A Level Summer project is to introduce you to studying this subject at A Level standard. You will need to complete 10 hours of study on each subject every week, 4½ in class with your teacher and the rest as independent learning. Therefore, it is important that you enjoy this subject and that you start to practice your study skills as early as possible. Some subjects have significant maths content (for example business, psychology, economics); others require strong essay writing skills (for example history, English). Think about the study skills and underpinning knowledge you will require in this subject - not just the title.

If after completing this project you think this may not be your ideal choice, you can ask to transfer to another subject at the start of term, as long as you have the entry requirements and it fits alongside your other choices on the A Level Matrix (timetable). If you do decide to change subject, you will be required to complete the transition project for your new choice too.

This is also your first taste of Flipped Learning and elements will be used within your first week of lessons.

Please ensure your name, student number and subject are clearly noted on each page and bring it with you to hand in at Induction.

We hope you enjoy this project as you start your A Level journey.

Have a good summer and we look forward to seeing you in September.

HOW TO SUBMIT:

Please print your completed project and bring a copy with you to Induction.

If you don't have access to a printer, electronic copies can be emailed as an attachment to Alevel_ComputerScience@chichester.ac.uk with the email clearly labelled 'Computer Science Summer Project' prior to Induction.

Computer Science Summer Project

Task 1

The legal, ethical and moral issues relating to the use of computer technology are one of the strands of the A-level course in Computer Science. You may at some point in the future be asked to do something as a computer scientist that may have wider implications than just getting the job done. The law of unintended consequences impacts all of us, none less than Sir Tim Berners-Lee.

“The benefits of the internet by making information available to the whole world far outweigh the damage done to a few by social media and fraud.”

Research the background to this statement and produce a reasoned argument in support of it, or to contradict it.

Your essay should be 1500 words in length. The sources you use need to be referenced.

Task 2

Project Euler is a website that presents nearly one thousand mathematical problems which also provide the basis for coded solutions.

Over the summer I would like you to undertake and document your solutions to at least six of the problems. You are advised to work on this task over the duration of the summer break because leaving it all to the last minute is a very bad idea.

Documenting your solutions must cover the following elements:

1. Show clearly which challenge you are addressing.
2. Draw a flowchart and/or write pseudocode for your solution including explanations of the variables and programming constructs that you have chosen to use.
3. Include screenshots of the code you write.
4. Provide evidence of testing.
5. Reference any sources you use to help you to create a solution.

Task 3

One of the areas where the specification for the A-level course builds on what is covered at GCSE level is in relation to the internal hardware components of a computer.

In this context I would like you to produce something* that will explain the role and operation of a processor and its major components:

- arithmetic logic unit
- control unit
- clock
- general-purpose registers

- dedicated registers, including:
 - program counter
 - current instruction register
 - memory address register
 - memory buffer register
 - status register.

* The format of what you produce is up to you and may provide you with an opportunity to show your creativity and awareness of audience. You must combine text and graphics to communicate information with the maximum of effectiveness. Please be aware that you may be asked to share the results of your work with the rest of the group during a lesson in the future.

All three tasks must be completed so that you can hand in your work, printed on paper, at Induction when term starts in September.

If you have questions or need anything about these tasks to be clarified, you can email me using gaynerj@chichester.ac.uk