



## **Summer Tasks July 2023**

### **Computer Science**

So, you think you would like to study: \_\_\_\_\_

#### **Summer Task Instructions:**

So you're thinking about choosing Computer Science as an A level. This task has been put together to help give you the best possible start in September by hitting the ground running

This task concentrates on material that you should have seen at GCSE.

Naturally the whole content is not covered in this assignment but there are a few key areas relating to hardware and logical thinking that underpin most aspects of the course.

It is expected that you will complete ALL the questions/problems in this task and submit your work during your first computer science lesson in September. This will form part of your initial assessment grade so it is very important that it is done to the best of your ability.

You can email [t.churchyard@springwoodhighschool.co.uk](mailto:t.churchyard@springwoodhighschool.co.uk) any questions relating to the task or the A-level course.

#### **Summer Task Title / Instructions:**

Please see below.

#### **Suggested Additional Reading:**

See separate document and the information below:-

Check the specification of your current system-

<http://www.wikihow.com/Check-Computer-Specifications>

Understanding the components of a computer system-

[https://en.wikipedia.org/wiki/System\\_requirements](https://en.wikipedia.org/wiki/System_requirements)

Terminology explained-

<https://schoolworkhelper.net/computer-components-and-specifications/>

#### **Suggested Visit:**

- Currys/PCWorld or similar establishment selling computers and computer components
- Company that uses Computers eg Bepak, Adrian Flux, Kings Lynn County Council.....

**Please submit the task to your teacher on the first lesson in September.**

**Feel free to do multiple summer tasks if you are unsure on what subjects to study.**



# **A LEVEL COMPUTER SCIENCE**

**Summer Task 2023**



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# Computer systems-

## How do I know which one to buy?



- **Research 3 differing computers that appear on shop shelves currently;**
- **For each:**
  - Give source
  - Image of system
  - Explain the hardware and software provided with the system
  - Explain the features it has that affect the processing capacity
  - Match the system to an appropriate task e.g. games design, photographer etc
  - Explain and research additional peripherals that would be required for each one
    - e.g. photographer requires a digital camera and image editing software.
    - Justify your decisions.
- **Select one of your systems. If this were to be part of a local area network due to the company expanding, discuss further hardware and software that would be required.**
  - You need to consider:
    - Security
    - Physical layout of the computers
    - Peer to peer or client server
    - Wireless or wired...
- **Present your findings as an informational leaflet to be given out in an electrical shop such as PCWorld.**
  - It needs to be written so specialists have adequate facts but terminology is explained so a non-specialist is able to make an informed choice between the systems. The leaflet should be a minimum of 4 pages (1 for each system and 1 for networking extra information).
  - It needs to include:
    - Diagrams
    - Images
    - Bibliography showing sources used





## Section 2

- 1 (a) Define the term storage device.

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..... [2]

A journalist works from home most days of the week. When stories are ready, she sends them electronically to the newspaper that she works for. Sometimes she needs to travel in to the newspaper offices in order to have meetings with the editor and to bring in stories which should not be sent via her email.

- (b) State **two** different types of secondary storage that the journalist would use making it clear what she would use them for.

1 .....

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2 .....

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..... [4]

(c) The journalist used to go into the offices of the newspaper every day and work there.

State the advantages and the disadvantages to the journalist of being able to work from home.

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..... [5]

A coffee company has coffee shops located across the country. Each shop has its own Local Area Network (LAN). The company wants to connect the shops in a Wide Area Network (WAN).

(a) (I) Describe **two** characteristics of a LAN.

1 .....

2 ..... [2]

(II) Describe **two** characteristics of a WAN.

1 .....

2 ..... [2]

(b) Describe **one** piece of hardware that each shop will need to connect their LAN to the company's WAN.

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..... [2]

The new network will enable the company to roll out a mobile phone application that allows people to place their orders before they arrive at the shop. The company is deciding whether to use a menu-driven interface or a natural language interface.

- (c) Discuss the advantages and disadvantages of natural language and menu-driven interfaces, justifying which you would recommend for the coffee chain's application.

The quality of written communication will be assessed in your answer to this question.

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper. In the bottom right corner, there is a small black rectangular box containing the number "81" in white.





## Section 3

### Task 1

Thief!

A thief has managed to find out the four digits for an online PIN code, but doesn't know the correct sequence needed to hack into the account.

Design and write a program that displays all the possible combinations for any four numerical digits entered by the user.

The program should avoid displaying the same combination more than once.

Submit a fully detailed showcase for your program

### Task 2

Caesar Cipher Implement a Caesar cipher, both encoding and decoding. The key is an integer from 1 to 25.

This cipher rotates the letters of the alphabet (A to Z).

The encoding replaces each letter with the 1st to 25th next letter in the alphabet (wrapping Z to A).

So key 2 encrypts "HI" to "JK", but key 20 encrypts "HI" to "BC".

For each challenge, show:

- Research:
  - the number of permutations possible for a 4 digit number
  - what Caesar Cipher is.
- A flowchart
- Program code (any high level language will do.... Python, Visual Basic, C#, Scratch)
- List of any variables, data structures used
- Proof it works as print screens!

