



## **Summer Tasks July 2020**

### **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:

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





# **A LEVEL COMPUTER SCIENCE**

**Summer Task 2020**

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## Section 1

# Computer systems-

## How do I know which one to buy?



- **Research 3 differing computer specifications; 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 a report with:**
  - Diagrams
  - Images
  - Bibliography showing sources used



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.

- .....
- .....
- .....
- ..... **[2]**





## 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 into Number of permutations from a 4 digit number and Caesar Cipher
- 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!