

A level Computer Science Transition Pack



Summer Transition Tasks

From September you will be studying the A level Computer Science qualification. The exam board is OCR and you can access the specification from here : [AS and A Level - Computer Science - H046, H446 - OCR.](#) Take some time to have a look at the specification and the content that you will be covering during the next two years.

Complete the following summer tasks before September.

Section 1

Research 3 different computers that appear on the shop shelves currently.

For each computer you should:

- Provide the source (website address).
- Select an image of the system.
- Explain the hardware and software that is provided by the systems.
- Describe how the software might be used and consider the categories that it belongs to. (OS, Applications, Utility).
- Match the chosen system based on specification to an appropriate task such as games design, photography etc. Explain why each machine is suited to this user.
- Explain and research additional peripherals that could be required for each use. For example, a photographer might require a digital camera and additional editing software.



Select one of the chosen systems. If this system were to be part of a local area network, what additional hardware and software may be required. If none, identify what the system currently has that will be essential for getting on the network.

- You should also consider and discuss the following points when considering a network:
 - How security will be provided. (Consider access levels etc)
 - Physical layout / topology of the computers (Star / Mesh).
 - Peer to peer or client server. (Benefits/drawbacks)
 - Wireless, wired or a hybrid network. (Benefits/drawbacks)

Present your findings as an information sheet which is to be given out at an electrical shop such as PC World.

- You should use subject terminology but ensure that the information sheet is accessible to all customers including technical and non-technical users.
- You should aim to include diagrams, images and a list of sources used.

Section 2: Questions

Look at these questions and provide a well-written answer.

1(a). Define the term storage device. [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.

1(b). State two different types of secondary storage that the journalist would use making it clear what she would use them for. [4]

1(c). The journalist used to go onto 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. [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).

2(ai). Describe two characteristics of a LAN. [2]

2(aii). Describe two characteristics of a WAN. [2]

3(b). Describe one piece of hardware that each shop will need to connect their LAN to the company's WAN. [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 of a natural language interface.

3(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. [8]

Section 3: Programming

If you have not used Python before....

Everyone should have experience of programming as it is an essential part of the course. If you need to develop your programming skills you should complete the "Learn the basics", Python tutorials from www.learnpython.org. You should read the theory, run the code, edit the code and complete the exercises. Keep screen shots of you doing this. You can download Python from www.python.org/downloads if you wish to install it at home.

If you have used Python before....

Task 1

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

Research Caesar cipher if you have not heard it before. You will need to write a program that implements Caesar cipher both for 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 of the programming challenges show:

- Program design – Flowchart / Pseudocode.
- Your program code in a suitable high-level language such as Python.
- Comment your code.
- Proof that you have tested it and shown it works.

