

Transition Work

Name of Subject: Computer Science

Summary of the course:

Exam Board: OCR

Course Title: A Level Computer Science (H446)

Subject/unit lead teachers and their contact:

Dr C Gurr – corin.gurr@plymptonacademy.tsat.uk

Read it:

In this task you get to investigate any area of emerging computer technology which interests you.

You can pick any area which interests you, but examples could be:

- Artificial intelligence
- Robotics
- Automated self driving cars
- Quantum computing

Do some general background reading on these areas and decide which one you are most interested in. Once you have chosen a topic - do some much more in depth reading. Read as much as you can about that particular topic (i.e. try to find 6 or more news stories, articles, book chapters etc).

Do it:

On ONE side of A4 (500 words) summarise the area you have chosen under the following four headings:

- What is it?
- What are the possible social, moral, cultural and ethical benefits of this technology on society?
- What are the possible social, moral, cultural and ethical risks of this technology on society?
- Conclusion on this technology and what it will mean for our world 10 years from now.



Do it: THE MOST IMPORTANT PART!

You will need to have some experience with coding, particularly with Python.

- Sign up for a free account at codemarker.uk and select GCSE Exercises
- There are 6 sections:
 1. Variables & Operators
 2. If Statements
 3. Arrays
 4. For Loops
 5. While Loops
 6. Functions & Procedures
- You need to complete a minimum of 6 exercises in every section
- Once you have done this, take a screenshot that shows “green ticks” next to each completed exercise.



(Optional) Stretch it:

Read the following article on Computational Thinking and solve the problem below.

<https://www.bbc.co.uk/bitesize/guides/zp92mp3/revision/1>

The Princess in the Castle

A princess lives in a long corridor in a castle. The corridor has 17 rooms, numbered 1 to 17 inclusive. Each night the princess sleeps in a different room according to the following rules:

- On the first night of the year she sleeps in a random room
- Each night she moves to an adjacent room; she never sleeps in the same room on two nights in a row and she always moves exactly one room left or right along the corridor
 - For example, if she is currently sleeping in room 12, then on the next night she will either be in room 11 or in room 13
 - If she is in room 1, then she must be in room 2 on the next night as she cannot move in any other direction (the same is true for room 17 - she must move to room 16 next)

A prince wishes to marry the princess. To do this he must find her room in the castle. However, whenever he sneaks into the castle at night, the guards quickly find him and throw him out! Therefore, he only has time to search one room each night.

The princess is unable to give the prince any clues to her location and the prince has no knowledge of her location, other than whether or not she was in the room he tried last.

- What strategy should the prince follow in order to find the princess in a finite time?
- What is the maximum number of nights the prince needs to search before he can guarantee finding the princess?