Computer Science: gateway resource

Below is a list of the 12 topics that make up the theory side of the course. Underneath each topic is a suggestion of an activity to do or a resource for you to read/watch…

Topic	Suggested Activity
1 – Components of a Computer	*Either…* find out what all the different components in a PC do – CPU, RAM, motherboard, ROM, hard drive etc. *Or…* find out what the following CPU terms mean – register, core, clock speed, cache, Von Neumann
2 – System Software	Look up how code gets compiled. You need to know the real nitty, gritty of this. What happens during Lexical Analysis, Syntax Analysis, Code Generation and Optimisation?
3 – Software Development	Find out what Little Man Computer is. This is a tough part of the course and a heads up will help.
4 – Exchanging Data	*Either…* Find out what Run Length Encoding and Dictionary Encoding do and file types each one is good for. *Or…* Look at the SQL programming language and how to structure the code (SELECT, FROM, WHERE)
5 – Networks	*Either…* Find out what HTML, CSS and JavaScript are used for when creating websites. *Or…* find out why DNS servers are so important to the Internet.
6 – Data Types	Find out the purpose of the ASCII alphabet/table. This video should help – https://www.youtube.com/watch?v=MijmeoH9LT4
7 – Data Structures	Find out why lists are so useful when programming. Read this page and the next few after it - https://www.w3schools.com/python/python_lists.asp If you an experience coder than look into 2D lists and dictionaries.
8 – Boolean Algebra	Look up Logic gates. You may have done this at GCSE but the A Level includes XOR alongside AND, OR and NOT. Be sure that you can draw them and do a truth table for each one.
9 – Ethical & Legal Issues	Find out what the different computing legal acts cover. There are 4 on the specification – Computer Misuse Act, Data protection Act, Copyright, Designs and Patents Act & Regulation of Investigatory Powers Act.
10 – Computational Thinking	Look at the following list and then choose 2 to look up online and find out what it means and where it is used. The list – Data Mining, Abstraction, Decomposition, Pattern Recognition, Backtracking, Pipelining and Visualisation.
11 – Programming Techniques	Find out what parameters are and the difference between passing by value and passing by reference.
12 – Algorithms	Find out what the Dijkstra's Algorithm is and where it is used. This video can help – https://www.youtube.com/watch?v=GazC3A4OQTE

Computer Science: induction resource

Below are 5 past paper ethics questions (the sort of stuff you will study in Unit 9). Choose one of the questions and have a good research into it. Then write out what you think a good answer be.

Choice of questions…

- InterMovie is a service that allows users to stream movies over the Internet. Discuss the legal issues the company might have considered in setting up this service and how it can ensure it complies with legal requirements.

- People burn calories as they move around. 'FitFeet' trainers come with an attachable device. This device estimates the calories burnt by the user whilst wearing the trainers. Users can then upload this data to their computers. The company wants users to register with their website. Users will provide details such as their weight, height, any allergies and pre-existing medical conditions. The system will use this information along with the data on their calories burnt to recommend meal plans for the user. Discuss the legal and ethical issues the company needs to consider for such a system.

- 'Modern technology and UK laws mean privacy is dead.' – Discuss the extent to which you agree with this statement.

- Companies have responsibilities with regard to the welfare of their employees. Discuss how computers have changed the way in which people work and the impact this may have on their wellbeing.

- Many websites try to ensure they are accessible to all visitors regardless of disability, language spoken or the device being used to access it. Discuss the technical and design measures that can be taken to ensure a website is accessible.