Year 10 Computer Science – summer 2021 work pack

REVISION PACK

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Introduction

Dear year 10 Computer Science students

This summer work pack has been put together to support your learning over summer. It is a sequence of 5 weekly lesson activities to prepare you for y11 Computer Science. I have explained to you how important it is to study outside of lesson and continue practising your programming skills. All this extra study will pay dividends next year when you sit your Computer Science exams.

You are a hard-working set of students and I know you have high aspirations for your education outcomes, so please see this guide as support on how you can make the most of your independent learning time over summer for your Computer Science qualification.

At the same time, I strongly believe that you should also find time over summer to take a break from studying so that you can feel free to explore your own interests and to rest. However, this break from study should not be extensive because you need to prepare for a busy year ahead.

As such, I have made a little study timetable which you could use to help you know when to revise certain topics, and perhaps provide you with some discipline in using your summer break effectively.

Have a lovely summer break.

Mrs Parkins

Study timetable

Please study the following topics as part of a structured learning experience. These topics are selected because they embody Computer Science, and they are fundamental to acquiring good overall computing knowledge. By you doing this extra independent revision, it will help us all to have a smooth start to year 11 Computer Science in September.

You can choose the length of time you spend studying these topics during summer, but please do at least endeavour to spend some time looking at all the below topics. Please make notes in your study book to help you to revise and remember these topics. I will be asking in September to see the revision notes that you have done over summer! I will also drop a test on you in early September!

I am hoping to be able to issue you with a purchased Computer Science revision study book in September. In the meanwhile, I have listed some reliable online sources of information for you to study from during summer, plus you of course have the Know It All Ninja website accounts to use.

Revision websites

Week	Topic	Website
1	Systems architecture	CraignDave video: https://www.youtube.com/watch?list=PLCiOXwirraUCaPt5zN4xJTIgKvzVYWa_5&v=t8H6-anK0t4
2	Systems architecture	Bitesize https://www.bbc.co.uk/bitesize/guides/zbfny4j/revision/1 Seneca - GCSE **OCR Computer Science** https://app.senecalearning.com/classroom/course/a1ce4570-6e27-11e8-af4b-35cf52f905c2
3	Algorithms	Bitesize https://www.bbc.co.uk/bitesize/guides/zjdkw6f/revision/1
4	Algorithms	Flowcharts and pseudocode https://www.bbc.co.uk/bitesize/guides/z6m7xfr/revision/2 https://www.computerscience.gcse.guru/topic/algorithm-design-and-problem-solving
5	Algorithms	Programming constructs https://www.bbc.co.uk/bitesize/guides/znh6pbk/revision/1
6	Networks	https://www.computerscience.gcse.guru/theory/computer-network

Revision booklets with exam style questions:

I have put together two booklets as additional revision aides for some of the above topics. These booklets are very informative, and they also have exam-style questions mid-way for you to complete.

Please feel free to dip in and out of each booklet at your own leisure.
I have given both the pdf and the Word versions of these booklets for you to use. It would be good if you could complete the exercises/exam questions in the booklets, and return them to school in September, so I can read and give you feedback on.

Revision booklet 1 – Software, Communications and Networking

Revision booklet 2 – Algorithms and Programming

In addition to these booklets, below I have included some revision aides if you need a little bit more structure to your independent learning. You may want to use them to help you process your thoughts.

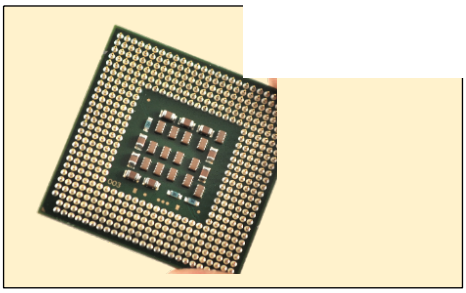
Revision aides

Below are some Pixl revision aides to break down the topic to make it easier to revise for you. Please use them as you wish for your own study purposes.

PiXL Revisit: Reduce and Transform

Unit/Topic: **Systems architecture**

1.



2. The purpose of the above computer component

3. Two main components – Control Unit (CU) and Arithmetic Logic Unit (ALU)

4. Registers in the CPU

Unit/Topic: Computer Memory and

Chunks of learning of this topic/area

* You could start with the most important or the most difficult to learn.

1. **Why is computer memory important?**
2. **Explain how primary memory is different to secondary memory.**
3. **When and why is virtual memory needed?**
4. **What is RAM and ROM?**
5. **Do computers really need cache?**
6. **Who is Von Neumann and why is he important in Computing?**
7. **All these acronyms – ALU, MAR, MDR, CU, PC, CIR – what do they all stand for?**
8. **Secondary storage?? Does that mean it's not as important as primary storage? What does it mean?**
9. **Registers and accumulators – so what do they have to do with anything?**
10. **What! Another acronym?? So, what's FDE all about? Please tell me!**

PiXL Revisit: Examine It

NOTES

Topic: - Software

1. Systems software
2. Operating system
3. Memory management
4. Utility software
5. Backup software

Key Words	Key Dates	Key Facts	Key Quotes	Key Formulae

ion: OCRApp is an app development company. The employees use the computers to write apps for mobile phones. OCRApp's employees' computers have systems software.

(a) State why the computers need systems software [1]
(b) Explain how the OCRApp employees benefit from the Operating System performing memory management. [4]
(c) Explain why backup software is important [1]
(d) Identify one additional type of utility software that the employees can make use of and explain how this would be used. [3]

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PiXL Revisit: Transform

Unit/Topic: **All I know about algorithms**

PICTURE/SOURCE/[illegible]

Key Points

1.

2.

3.

4.

5.

6.

7.

8.

Most important + WHY:

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Programming challenges

Practise your programming skills with these programming challenges. You should aim to complete at least two of these challenges during summer.

1	Year Addition		Create a program that accepts a year in the format ####, e.g. 2015. The program then adds each digit of the year together and outputs the answer. E.g. 2015 becomes the output 8.
2	Tilers mate		Have the user enter the: • width and length of the floor • width and length of a tile • the cost of a tile and have the program calculate the total cost to cover a floor plan using a cost entered by the user (per tile or metre^2).
3	Reverse it		Allow a user to enter a string. The program will reverse it and print it back to the screen, e.g. If a user enters "Hello my name is Gemma" the output will be, "ammeG si eman ym olleH". The program should also count the number of vowels and consonants and print these to screen
4	R@nd0m P@ssw0rd		Have the program create random strong passwords mixing upper and lower case, symbols and numbers. The user can choose how long they want the password to be. A strong password must contain: • a capital letter • a number • a symbol
5	Game of Chance		A user can bet on any number from 0 to 30. • If it's an even number, they 2x their money back. • If it's a multiple of 10, they get 3x their money back. • If it's a prime number, they get 5x their money back. • If the number is below 5, they get a 2x bonus. Create a program that allows the user to guess a number. A random number is generated. If the user guess is the same as the random number, then the user wins. After 10 goes, their name and score are written to a file.


PiXL
Think