Year 11 Transition Booklet – A Level Computer Science

"Everyone should learn how to code, it teaches you how to think!"
Steve Jobs

Computer Science: Transition Guide

A Level Computer Science

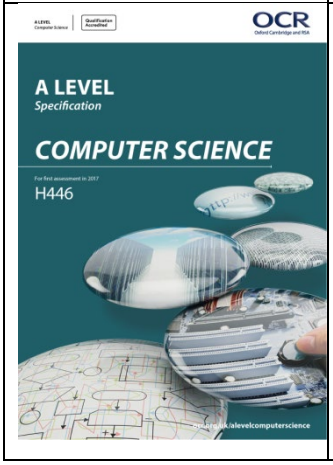
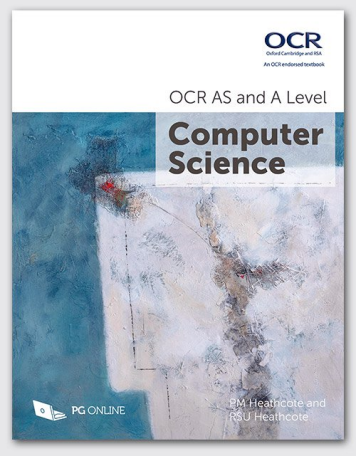
Examination Board: OCR

Within the course there are 3 components:

ASSESSMENT

Component	Assessment	Weighting	Marks and duration
01 Computer systems	Externally marked question paper	40%	140 marks / 2 hr 30 mins
02 Algorithms and programming	Externally marked question paper	40%	140 marks / 2 hr 30 mins
03 Programming project	Internally assessed, externally moderated	20%	70 marks

Resources you will be using in this course:

Specification	Textbook	Lesson Materials
		

Year 12:

Here's a brief look at the course units and the content for our AS and A Level Computer Science qualifications.

AS COMPUTER SCIENCE

01 COMPUTING PRINCIPLES

This component will be a traditionally marked and structured question paper with a mix of question types: short-answer, longer-answer, and levels of response mark-scheme-type questions. It will cover the characteristics of contemporary systems architecture and other areas including the following:

- The characteristics of contemporary processors, input, output and storage devices
- Software and software development
- Programming
- Exchanging data
- Data types, data structures and algorithms
- Legal, moral, ethical and cultural issues.

02 ALGORITHMS AND PROBLEM SOLVING

This component will be a traditionally marked and structured question paper and will include a mix of question types: short-answer, longer-answer, and levels of response mark-scheme-type questions.

There'll be a short scenario/task contained in the paper, which could be an algorithm or a text page-based task, which will involve problem solving.

Other areas covered include the following:

- Elements of computational thinking
- Problem solving and programming
- Algorithms.

Year 13:

A LEVEL COMPUTER SCIENCE ASSESSMENT OVERVIEW – FIRST EXAM JUNE 2017

Component		
01 Computer systems	Mix of question types: including short-answer, longer-answer, and banded mark-scheme-type questions.	**The characteristics of contemporary processors, input, output and storage devices** Components of a computer and their uses **Software and software development:** Types of software and the methodologies used to develop them **Exchanging data:** How data is exchanged between different systems **Data types, data structures and algorithms** How data is represented and stored in different structures and the use of different algorithms **Legal, moral, cultural and ethical issues** Laws surrounding the use and ethical issues that can arise from the use of computers
02 Algorithms and Programming	Two sections: **A** – Traditional questions concerning computational thinking. Mix of question types: including short-answer, longer-answer, and levels of response mark-scheme-type questions. **B** – Scenario/task contained in the paper, which could be an algorithm but will involve problem solving. Short-answer, longer-answer questions, and levels of response mark-scheme-type questions.	**Sections A and B** **Elements of computational thinking** What is meant by computational thinking **Problem solving and programming** How computers are used to solve problems and programs can be written to solve them **Algorithms** The use of algorithms to describe problems and standard algorithms
03 Programming project	Candidates and/or centres select their own user-driven problem of an appropriate size and complexity to solve. This will enable them to demonstrate the skills and knowledge necessary to meet the Assessment Objectives.	Analysis of the problem Design of the solution Implementation of the solution Evaluation

Transition Activity: : Week 1 (Python Programming)

The following Tasks will need to be attempted before during this week. Your knowledge in these topics will be assessed in a classroom test.

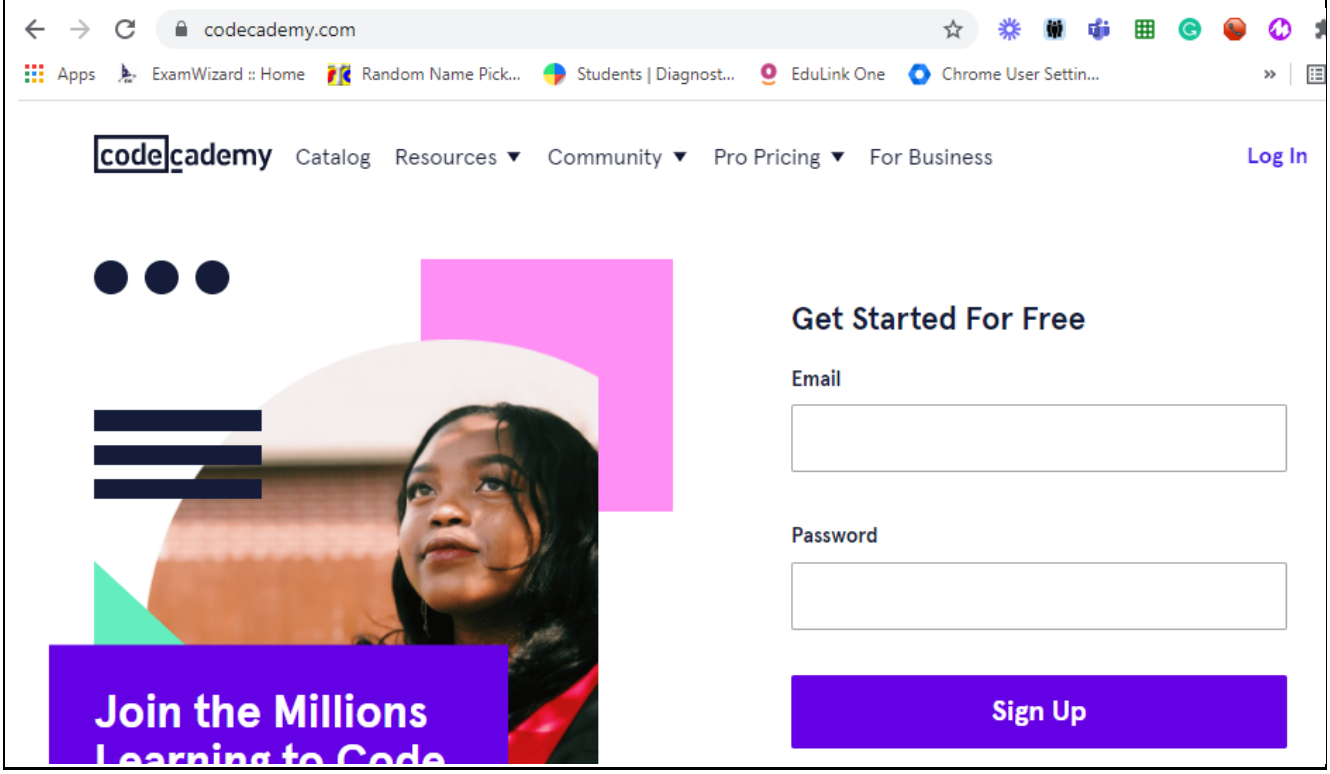
Task 1: Programming

Programming Task 1:
Visit www.w3schools.com/python and work through Python Exercises.

You must cover the following topics:
Python Syntax
Python Variables
Python Numbers
Pyton Strings
Python Operators
Python Lists
Python Sets
Python Dictionaries
Python If…Else
Python While Loops

Task 2: Programming exercises:

Register with www.codecademy.com and work through “Programming with Python” tutorial.



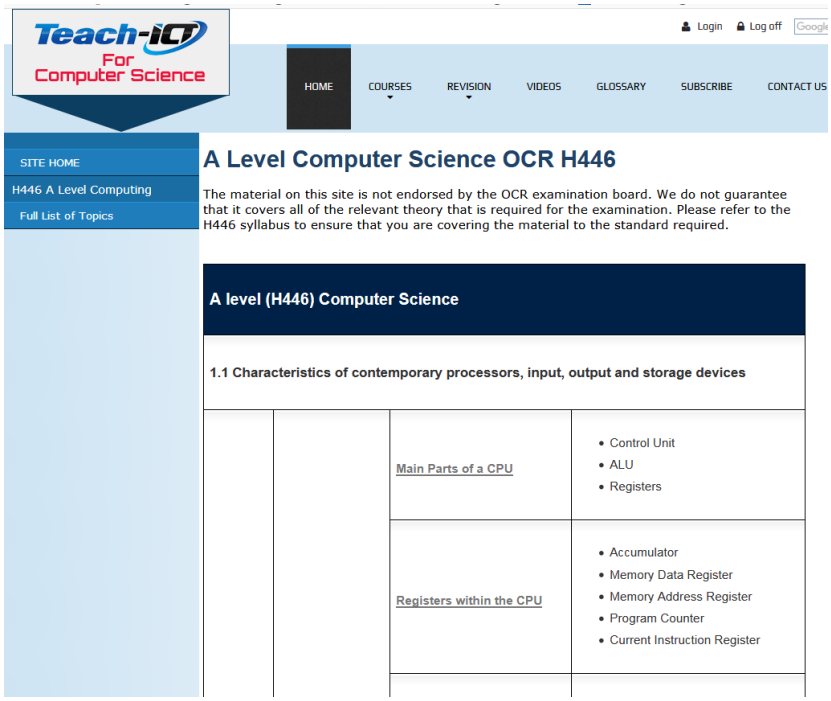
Transition Activity: : Week 2 (Systems Architecture)

Task : Understanding Computer Architecture

Visit the Teach-ICT.com website and read through topics on “1.1 Architecture”, and make essential notes and mindmap from the link below. You will need the following username and password for the Teach-ICT website:

Link to Teach-ICT.com

https://teach-ict.com/2016/A_Level_Computing/OCR_H446/OCR_H446_home.html



Login details for Teach-ICT.com

Username: e10rh

Password: computer2

Topics to cover:

Main Parts of a CPU, Registers within the CPU, Fetch-Decode-Execute Cycle, CPU performance factors, System performance factors, Von Neumann and Harvard

Transition Activity: : Week 3

Data Types, Data Structures and Algorithms

Use the teach-ict.com website to develop your knowledge and attempt these task.

Task 1 Converting between denary, binary and hex

No	Denary	Binary	Hex	Add 00011110 to the Binary value in column 3
1	**1**			
2	**5**			
3	**10**			
4	**22**			
5	**40**			
6	**77**			
7	**91**			
8	**121**			
9	**144**			
10	**168**			
11	**170**			
12	**200**			
13	**211**			

Task 2

Create a program that analyses a passage of text from a file and then counts:

- How many words
- The average length of a word
- How many times each word occurs
- How many words start with each letter of the alphabet?
- The aim of this exercise is to test your ability to develop algorithms

Task 3 Binary Truth Tables

Write the truth tables for the expressions

NOT (A AND B)

and ((NOT A) OR (NOT B))

2. What do you notice about these tables?
