

WEST COVENTRY SIXTH FORM



West Coventry Academy

SUBJECT TRANSITION BOOK Summer 2024

Computer Science

STUDENT NAME:

SCHOOL:

This booklet has been prepared by Computing staff for you to read and the work contained in it will ensure that you get off to the best possible start in this subject area. It is very important that you read this booklet carefully over the summer and have a thorough attempt to complete the work and submit it at the start of the year to your subject teacher in the very first lesson. This will be the first impression you create and is a real indicator of how seriously you are prepared to be in your studies.

A Level Computer Science

This subject is taught at:

West Coventry Academy

The key staff are:

Ms Dhanjal – Subject Leader for Computer Science and IT, West Coventry Academy <i>staffpxd@westcoventryacademy.org</i>

Course Details

Course Title: A Level Computer Science

Exam board: OCR

Exam Code: H446

Exam Board website: www.ocr.org.uk

Assessment method:

2 External Examinations worth 40% each, and practical coursework worth 20%

About the course

This is a challenging and engaging course that combines theoretical knowledge of computing and programming structures with a practical application of programming skills. This course is ideal for students who are passionate about computing and programming, who are keen to enter into further education or a career in this area. Lessons will involve practical activities as well as reviewing theoretical concepts. This course does have an element of coursework and practical programming at A2, though is predominantly assessed through final examinations. Practical, real world projects are undertaken to give students an insight into how programming is used in the modern business world.

A Level Computer Science:

Unit 1: Computer Systems

This is an externally assessed unit, involving a final written examination. This unit covers key theory required for programming including computer systems, processors and software types. It also covers the use of data, and how data can be stored and processed effectively using relational databases. Students then cover the legal, moral and ethical implications of computing to equip them for moving on to programming.

Unit 2: Algorithms and programming

This is an externally assessed unit, involving a final written examination. This unit involves students developing their programming skills using Python, Java, JavaScript, PHP, HTML, CSS, SQL. They will be required to solve problems using algorithms, and develop an understanding of key elements of coding and programming. This covers the practical understanding of how to solve problems and produce relevant code in order to do this.

Unit 3: Programming project

This is a practical programming unit, where students will be given a project to complete using the planning techniques they have developed, and the practical coding that they will learn as part of this unit. Students will code using Python, SQL, PHP, JavaScript, HTML, CSS, C++, C# and Java. This will give students an understanding of a broad range of programming languages.

Academic and Career Pathways

Computer Science is an ideal subject for those who want to study Computing at a higher level, or want to enter into a computing based career such as data management, games design, software engineering or computer programming.

Please complete the following assignments over summer ready to hand in on the very first lesson in this subject: Wednesday 11th September 2024

Task One:

One of the topics that you will be covering in Unit 1 is **1.4.1 Data Types**.

Research and answer the following questions on this topic.

- 1) In programming, list the 5 data types?
- 2) What is the process for carrying out 8-bit binary addition? Give 2 examples.
- 3) What is the process for carrying out 8-bit binary subtraction? Give 2 examples.
- 4) Negative numbers in binary can be represented by using **sign and magnitude** and **two's complement**. Explain the difference between these two representations, giving at least one example of each.

Task Two:

You need to access the website <https://www.w3schools.com/python/default.asp>

This is the main website we use at A Level to learn new programming languages like Python, HTML, CSS, JavaScript, SQL, Java, C++, C#.

Your summer task is to learn some basic Python. This will help you to tackle the more advanced techniques in Year 12. So please can you work through the Menu options, on the left hand side – All the topics from **Python HOME** to **Python Functions**. These topics relate to the GCSE programming techniques that you have learnt. If you have not completed GCSE Computer Science, then it is important that you complete this task. You will have some mini python projects to complete in the first few weeks.

The screenshot shows a web browser window displaying the 'Python Functions' page on w3schools.com. The browser's address bar shows the URL 'w3schools.com/python/python_functions.asp'. The page features a navigation menu on the left with 'Python Functions' highlighted. The main content area includes an advertisement by Google, followed by the text: 'A function is a block of code which only runs when it is called. You can pass data, known as parameters, into a function. A function can return data as a result.' Below this is the heading 'Creating a Function' and the start of a paragraph: 'In Python a function is defined using the def keyword:'. The browser's taskbar at the bottom shows the date '19/06/2023' and time '11:26'.