THE CROSSLEY HEATH SIXTH FORM

A-Level Computer Science

Welcome!

We are delighted to welcome you to the Computer Science department as you prepare to begin your A-Level journey. Having completed your GCSEs, you now stand at the threshold of a new and exciting phase of your education; one that will challenge you to think more deeply, problem-solve more creatively, and build a sophisticated understanding of how technology shapes our world.

A-Level Computer Science is a highly rewarding and intellectually stimulating subject. It combines logical thinking with real-world application, enabling you to design systems, write efficient code, and gain insight into the fundamental principles that underpin modern computing. Whether your future lies in software engineering, artificial intelligence, cyber security, data science or something entirely different; this course will provide a strong and adaptable foundation.

Our department is committed to supporting you throughout this journey. We strive to support a collaborative learning environment where curiosity is encouraged, questions are welcomed, and students are challenged to reach their full potential. You will be introduced to a range of programming techniques, computational theory, and practical problem-solving approaches; all while developing the analytical mindset so highly valued in both academia and industry.

To help you make a strong start in September, we've prepared some *bridging work* for you to complete over the summer. This work is designed to consolidate key knowledge from GCSE, introduce some core concepts from the A-Level course, and begin developing the skills you'll need to thrive. We strongly encourage you to engage fully with these tasks, as they will give you a valuable head start and help ensure a smooth transition into Year 12.

We look forward to meeting you in September and sharing what promises to be a fascinating and inspiring journey into the world of Computer Science.

Mr M Weston

(Associate Assistant Head Teacher/Department Leader for Computer Science)

Mr N Charlesworth

(Teacher of Computer Science/Head of Yr9)

Exam Board and Specification: OCR A-Level Computer Science (H446)

Link to Specification: https://www.ocr.org.uk/images/170844-specification-accredited-a-level-gce-computer-science-h446.pdf

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Bridging work

Visual Studio Community

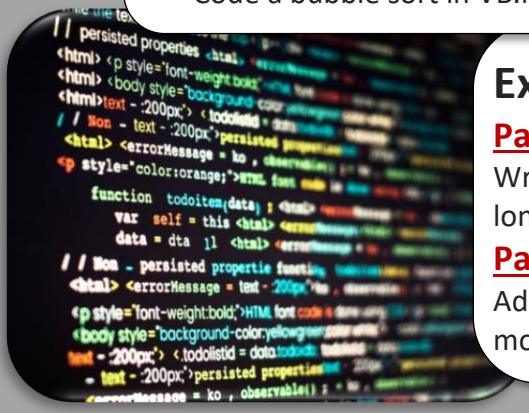
Task 1: (25 minutes)

Download and install Visual Studio Community
Make sure you select all the VB.NET options when selecting what to install
https://visualstudio.microsoft.com/vs/community/

Task 2: (5 hours)

New to coding…

- Learning the syntax and understand how to use:
- Variables, Datatypes, Arrays, Loops (For and Do)
- Code a bubble sort in VB.NET



Experienced in coding…

Part 1

Write a bubble sort which sorts 10,000 random integers. Time how long this takes using the VB.NET stopwatch

Part 2

Adapt your code to make it more efficient – There is a prize for the most efficient piece of code.

Task 3: The fetch decode execute cycle (4 hours)

Part 1

Use the Internet to research the fetch decode execute cycle. Describe how it works and where it is used.

Part 2

Describe at each stage of the process how the following registers are affected:
Program counter (PC)
Memory data register (MDR)
Memory address register (MAR)
Current instruction register (CIR)
Accumulator (ACC)
The buses
Arithmetic logic unit (ALU)
Control unit (CU)

Part 3

Use the animation features in PowerPoint to create an animation showing how two numbers would be loaded from memory and added together using the Fetch decode execute cycle.

Task 2

Space for your work

Task 3

Space for your work

Task 3

Space for your work