GCSE
Computer Science

William Hulme's Grammar School
The best in everyone™
Part of United Learning

The study of how computers work, how they communicate globally, and why *Computational Thinking* helps us solve problems. In Computer Science we create algorithms and code programs to achieve remarkable goals. It's the choice of the logically minded, the creative problem-solver, the analytical thinker. Computer Scientists enjoy Maths, languages and puzzles and solve the world's problems with technology. As the fourth Science and a prestigious E-Bacc subject, Computer Science opens doors to the most exciting careers and further studies such as Cybersecurity, Bioinformatics, Natural Language Processing, Artificial Intelligence and Robotics.

"Programmers are the wizards of the future. You're going to look like you have magic powers compared to everybody else".

Gabe Newell, Valve Software, author of the "Counter-Strike" games.

Unit 1: Computer Systems

- Systems architecture, CPU, Memory and Storage – **the "nuts and bolts" that make up the machine**
- Networks, topologies and protocols – **how devices talk to each other, the internet and web pages**
- Cybersecurity – **how to keep computers safe from hackers, firewalls, encryption, codes and ciphers**
- System software, the OS and utilities – **programs that bring the computer to life**
- Moral, social, legal, environmental issues – **the "big questions" of Computing: How will AI change the world? Should I accept cookies? What should we do about waste technology? How can smartphones improve mental health? Will the robots kill us all?**

Unit 2: Algorithms and Programming

- Languages and Translators – **How do we turn Python code into instructions for a CPU that talks only binary?**
- Computational Thinking – **creating abstractions and solving problems using logical thinking like a boss!**
- Algorithms – **creating flowcharts and pseudocode, standard algorithms, sorting and searching**
- Computational logic – **Boole says…** ***"party = done homework AND NOT (detentions)"***
- Data representation – **Text, images and sound: how can a binary numbers machine play music videos?**

You will also complete lots of **practical programming** over the two years using Python, HTML and Javascript; previous students have made dice games, maths quizzes and a text adventure game as well as prototype apps for smartphones.

Visit www.whgs-academy.org/secondary/subject-areas/computing or see @WHGSComputing on Twitter

Year 11 and 12 Computer Science Discovery Day at PwC Manchester

GCSE programming practical – a text adventure game

```
*Python 3.8.0 Shell*
File  Edit  Shell  Debug
Python 3.8.0 (tags/v3.8.0:fa919fd
tel)] on win32
Type "help", "copyright", "credits" or "license()" for mo
>>>
========== RESTART: C:/Users/al/OneDrive/Git/Python3/d
Welcome to 'darkroom' - a text adventure
Your mission is to find the 'darkroom'
You are in the lobby which is a hotel lobby
You can see: ['chair', 'table', 'note']
You are carrying: []
You can go in these directio
N S E W
What next?N
You are in the stairwell whic
You can see: []
You are carrying: []
You can go in these direction
S U D
What next?s
You are in the lobby which is
You can see: ['chair', 'table'
You are carrying: []
You can go in these directions:
N S E W
What next?get note
You are in the lobby which is a hotel lobby
You can see: ['chair', 'table']
You are carrying: ['note']
You can go in these directions:
N S E W
What next?read note
I don't know that command yet, what next?s
```

Wondering if coding is for you? If you want to play this game and "fork it" to extend it, making your own rooms and features, go to: repl.it/@mraharrison/darkroom

The Caesar Cipher is an early form of Encryption, but what message has been encrypted here?

FVB HYL H JVTWBALY ZJPLUAPZA

A Computer Science career is varied and challenging. As Google says: *"Challenge your ingenuity and solve world-changing problems with cutting-edge flair."*

More information

See the school website or speak to Head of Computing, Mr A Harrison BSc. (Computer Science), Miss Shabir or Miss Ali.

→ WHY OCR COMPUTER SCIENCE?

The Royal Society report, published in January 2012, states that "every child should have the opportunity of studying Computing at school".

The GCSE OCR computing course will give students a real, in depth understanding of how computer technology works, an insight into what goes on 'behind the scenes' including computer programming. The course provides excellent preparation for higher study and employment in the field of Computer Science.

The increasing importance of information technologies means there will be a growing demand for professionals who are qualified in this area. The course will develop critical thinking, analysis and problem-solving skills through the study of computer programming.

This is a fun and interesting way to develop these skills, which can be transferred to other subjects and applied in day-to-day life and is an excellent preparation for students who want to study or work in areas that rely on these skills, especially where they are applied to technical problems.

These areas include engineering, financial and resource management, science and medicine.

Starting salaries for Computer Science graduates range from £27k – £50k!

All of William Hulme's 2019 leavers from Year 13 went on to study their chosen courses at University, including Michal who is now employed by PwC on a fully-funded Degree Apprenticeship.