



Year 9 Computing – Computer Systems 3

Learning about this topic is important because:

We will learn about the language the CPU understands to carry out tasks and be able to write simple programs using it. This will also help us develop our coding skills.

This builds on:

Computer Systems Part 2 (Year 8) where we introduced the CPU and its relationship to Main Memory (RAM) and the Secondary Storage,. In this unit we develop our understanding further by learning about the cycle of the CPU, how the speed of the CPU is measured. We will also look at the “big picture” of how everything we have learnt in Computer Systems 1, 2 and 3 fit together.

This leads to:

Year 10 – Systems Architecture (1.1) / Memory and Storage (1.2)

We will learn:

- **The Fetch, Decode Execute Cycle of the CPU.**
- **The performance of a CPU (speed) and the units of measurement (Hz, KHz, MHz, GHz)**
- **We will research different types of processors used for different devices.**
- **Understanding of the “overall picture” of how the components studied and CPU cycle work together to allow computer systems to perform tasks.**

We will develop/practise skills including:

- **Research skills**
- **Application of knowledge to different scenarios**

Some of the vocabulary that we will use includes:

Fetch, decode, execute, CPU cycle, clock speed, Hz, KHz, MHz, GHz, RAM, Secondary Storage, ROM.

You could learn more about this topic by:

CPU and the FDE Cycle – Click [here](#)

If you really want to develop your understanding!!

Little Man Computer (CPU Simulator) – Click [here](#)

LMC tutorial – Click [here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are:

End of Unit Assessment Test



Year 9 Computing – Data Representation 3



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Learning about this topic is important because:

Everything we use on computers such as programs and files are ultimately represented as a binary, a sequence of 1s and 0s. We will now be building on what we covered in Year 7 and Year 8 to look at how sound can be represented in binary. We will also look at not just how data is represented, but how data is represented efficiently when we study different methods of data compression.

This builds on:

Data Representation 1 (Year 7)

This leads to:

Year 10 – Memory, Storage and Data Representation (GCSE Topic 1.2)

We will learn:

- The difference between analogue and digital signals
- The concept of sampling analogue waves and storing them as digital audio files.
- Calculating the file size of a sound file.
- The effect changing a sample rate will have on audio quality and sound files.
- Why we need to compress data.
- The difference between lossy and lossless compression.
- How to apply lossless compression to image files.

We will develop/practise skills including:

- Mathematical Skills (binary/decimal conversion)
- File size calculations – sound files.
- Manipulating sound files using Audacity sound editing software.

Some of the vocabulary that we will use includes:

Bit, byte, sample, sample rate, quality, file size, audio, wave, compression, lossy, lossless, run length encoding.

You could learn more about this topic by:

Representing text, sound and images – Click [here](#)
Audacity (Sound editing software) – Complete beginners Guide – Click [here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: **End of Topic Test, Key Homework**



Year 9 Computing – Computer Networks 2



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Learning about this topic is important because:

Following on from Year 8 Computer Networks topic, we will now learn about larger scale networks. The Internet (the largest scale network of all!) is a huge part of our everyday lives, we will learn the basics of how it works.

This builds on:

Computer Networks 1 where we looked at the basics of computer networks, why we use them and some of the equipment used to put together a local area network.

This leads to:

Year 10 GCSE topic 1.3 - Networks, Protocols and Layers

We will learn:

- **What the Internet and the World Wide Web are.**
- **How web addresses (URLs) are made up.**
- **How data is sent across the internet (packet switching).**
- **The IP Address system.**
- **The role of the Domain Name Server (DNS) in sending data across the Internet.**
- **Different types of connectivity (copper and fibre optic cables) and why different types are used.**
- **The concept of bandwidth and why this is important.**

We will develop/practise skills including:

- **Application of knowledge to different scenarios**
- **Research skills**

Some of the vocabulary that we will use includes:

Internet, world wide web, domain name server, IP Address, Uniform Resource Locator, packet switching, connectivity, fibre optic, bandwidth, router.

You could learn more about this topic by:

Internet and Communication introduction – Click [here](#)

Bit beyond Year 9 but great video on how data is sent across the Internet (A packet's tale) – Click [here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: **End of topic test, key homework**



Year 9 Computing – Programming with Python 3



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Learning about this topic is important because:

All of the programs on our computers and apps we use on our phones have been created using computer programming languages. Not only is being able to program an important thing to learn for school, but we are learning a language which is used to create lots of real-world programs/apps. This topic follows on from the basics we covered in Year 7

This builds on:

Programming with Python 2 (Year 8) where we introduced the concept of counter-controlled iteration and list data structures.

This leads to:

Programming Techniques (Unit 2.2 OCR GCSE Computer Science) – Year 10

We will learn:

- **Condition controlled iteration (loops which do not run a fixed number of times, but until a condition is no longer met) – “while loops”.**
- **How programs can be broken down into sub-programs in Python.**
- **The two types of sub-program (procedures and functions) and the difference between the two.**
- **How to code basic graphical user interface (GUI) elements in Python**

We will develop/practise skills including:

- **Writing programming code using Python.**
- **Testing a program and fixing errors (debugging)**
- **Developing code for scenarios.**

Some of the vocabulary that we will use includes:

Repetition, iteration, loop, condition controlled iteration, subroutine, procedure, function, parameters, GUI, interface.

You could learn more about this topic by:

Online Python tutorial (W3Schools) – Click [here](#)
Time2Code (may be a little advanced for Y9 in places – Click [here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: **End of topic test. Key Homework**



Year 9 Computing – Sorting Algorithms

Learning about this topic is important because:

In Year 8 we learned about how searching data sets can be more efficient if the data is ordered (using binary search algorithm), we are now going to consider some of the algorithms which can be used to sort data into order for more efficient processing.

This builds on:

Year 8 – Searching Algorithms

This leads to:

Year 11 – Algorithms (GCSE Computer Science)

We will learn:

- **Why computers need to be able to sort data**
- **How the bubble sort search algorithm works and how to show the steps of the algorithm with sets of numbers/words.**
- **How the bubble sort can potentially be made more efficient using bucket sorting.**
- **How the Insertion sort algorithm works and how to show the steps of the algorithm with sets of numbers/words.**
- **Compare the two sorting algorithms in terms of their efficiency for sets of numbers/words.**

We will develop/practise skills including:

- **Application of both bubble (+ bucket) and insertion sort search algorithms to specific sets of data.**
- **Comparison of the efficiency of the two algorithms with different sets of test data and determine the best algorithm for specific scenarios.**

Some of the vocabulary that we will use includes:

Sorting algorithm, bubble sort, comparisons, swaps, pass, bucket sort, insertion sort.

You could learn more about this topic by:

Sorting Algorithms – Interactive Visualisation – [Click Here](#)
KS3 Sorting Algorithms – [Click Here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: **End of topic test. Key Homework**



Year 9 Computing – Sorting Algorithms



West Kirby
Grammar School



Year 9 Computing – Computing Impacts Project: Social Media Algorithms - Ethics

Learning about this topic is important because:

This builds on:

Year 8 – Computing Impacts Project: Artificial Intelligence

This leads to:

Year 11 – (GCSE Computer Science) – Social, Legal and Ethical Issues in Computing

We will learn:

- What algorithms are in the context of social media apps and the purpose they serve for the user and the social media company.
- Some of the factors the algorithms take into account when determining the content a user will see on their feed.
- The impacts of these algorithms both positive and negative, considering issues such as personalisation of content, diversity of content, user behaviour and mental health impacts.
- Social media in the news – Considering real world case studies
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We will develop/practise skills including:

- Researching for information online, considering trust and reliability of sources and making effective use of search engines.
- Presenting findings in a meaningful way which is appropriate for the intended audience.

Some of the vocabulary that we will use includes:

Algorithm, content, privacy, safety, harmful content, engagement, diversity of content, addiction, ethics, responsibility, personalisation

You could learn more about this topic by:

Social media algorithms video – Click [here](#)
Social media data privacy explained – Click [here](#)
How algorithms decide what we see on social media – Click [here](#)



Your teacher will assess your knowledge & understanding throughout the topic by looking at your work, questioning, discussion and giving you feedback in lots of different ways. The key pieces of work in this topic are: **Research homework / project presentation**