

Scheme of Learning: Year 8 Computing

Topic Sequence:

1	2	3	4	5	6
Computer Systems	Representation	Developing for the Web	Intro to Python	Heroes of Computing	Mobile App

Topic Overview:

This unit takes learners on a tour through the different layers of computing systems: from programs and the operating system, to the physical components that store and execute these programs, to the fundamental binary building blocks that these components consist of.

The aim is to provide a concise overview of how computing systems operate, conveying the essentials and abstracting away the technical details that might confuse or put off learners.

The last lessons cover two interesting contemporary topics: artificial intelligence and open source software. These are linked back to the content of the unit, helping learners to both broaden their knowledge and focus on the topics addressed in the unit.

Links
Year 8 – Representation GCSE Computing- Unit 3 Computers

Lesson Sequence:

Lesson 1: Get in gear - To develop an understanding of this unique characteristic, learners will compare calculating machines from the past to modern general-purpose computers. After that, they will connect the important but perhaps abstract idea of a program to the applications that they use every day. Finally, they will execute a program themselves, playing noughts and crosses with a human opponent.

Lesson 2: Under the hood - Learners will discover how all computing systems, regardless of form or capabilities, make use of the same components: a processor, memory, storage, input and output devices, and communication components. They will form a simple, concise picture of what each of these 'universal' components does, and how they work together to execute programs.

Lesson 3: Orchestra conductor - The abstract descriptions of how the processor, memory, storage, and communication components interact with each other and function as a system will now be embedded in concrete, familiar scenarios that the learners will investigate. Through the activities in this lesson, learners will look under the surface and gain a further glimpse into what goes on under the hood when they use computing devices.

Lesson 4: It's only logical - Through practice, learners can master the use of logical expressions in software, but it is a different story altogether to uncover the connection between logic and computing hardware. This is the deeper goal of the lesson: to bridge the gap between logic and circuits and make the direct link between them explicit.

Lesson 5: Thinking machines - In this lesson, learners will attempt to define the term 'artificial intelligence' and explore the kinds of problems that it has traditionally dealt with. They will also focus on machine learning and investigate its relationship with conventional programming. Learners will move on to use Google Teachable Machine, to gain an insight into what training a model involves, and the ethical considerations that are tied into building any system that makes decisions.

Lesson 6: Sharing - In this final lesson, learners will take a quiz that will assess their understanding of the computing systems concepts that they have encountered throughout the unit.

National curriculum links

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- understand simple Boolean logic (for example, AND, OR and NOT) and some of its uses in circuits and programming
- understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems
- understand how instructions are stored and executed within a computer system

Sequence of Lessons:		Topic Resources:	
		Knowledge Map:	8.1 Computer Systems
		Any other Resources:	
Assessment:			
		Knowledge:	16 Multiple choice questions
		Application of Knowledge:	Homework and Lesson activities
Supportive Reading:			
		Hardware and Software	Hardware and software - KS3 Computer Science - BBC Bitesize
		KS3 Computing Complete Revision & Practice - CGP	Chapter 1 Available from: KS3 Computing Complete Revision & Practice CGP Books
1	Lesson 1: Get in gear		
2	Lesson 2: Under the hood		
3	Lesson 3: Orchestra conductor		
4	Lesson 4: It's only logical		
5	Lesson 5: Thinking machines		
6	Lesson 6: Sharing		