



Year 8 Computing Curriculum intent

Build on students' understanding of computing fundamentals to develop their understanding of how computers work from the inside and the processes involved. Students will learn how data is represented in a computer by translating characters into Binary and Hexadecimal. Students will then develop their programming skills to create programs using basic Python and then apply the skills to move a robot to commands.

Year 8 Computing Curriculum Overview

Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6
Data Representation		CGI (Computer Generated Imagery)	Inside a Computer	Python Fundamentals	Physical Computing
Key question					
How can data be represented in different ways?	How does a computer read and translate data?	How are images represented digitally?	What happens inside the computer to make it work?	How do we create a basic program using a new language?	How does programming interact with the real world?
Key Vocabulary					
ASCII Binary Denary Nibble Bit Byte	Binary Addition Column Addition Carry Conversion Hexadecimal Overflow	Pixel Resolution Colour Depth File Size RGB Binary	Software Storage Input Output CPU (Central Processing Unit) Logic	Variable Data type Function Selection Loop Debugging	Physical Computing Sequence Repetition Iteration Command Sensor

	The knowledge you will need to recall:	How you will apply this knowledge:	This links to:
1	1. Data and information can be represented in a number of ways that is not always typed or written characters that we recognise and use everyday. The different methods of representing data are used depending on the requirements 2. Computers represent all data using binary, this is also often known as Base -2, denary numbers (that are used in western mathematics is also known as Base-10). Binary numbers are calculated using a Bit Value Table, each number in the BVT is a bit, 4 binary characters become a nibble and then 8 binary characters is a BYTE.	1. You will be able to recognise a variety of methods of representing data with an understanding of its use 2. You will use the Bit Value Table to be able to convert denary numbers into 8-bit Binary and vice versa.	Year 9 topic 1 looks at how images and sounds are represented using binary and hexadecimal GCSE Paper 1 Topic 2 students will be able to manipulate binary numbers to undertake a range of functions and calculations. GCSE Paper 2 Topic 6 students are expected to use their understanding of binary to complete practical programming problems. IDEA award Data Play Citizen award IDEA award Maths Tools for AI Worker award
2	1. Binary numbers can be added together using a set of rules and column addition method. If the number of binary 2. Binary numbers can be simplified for coding purposes into Hexadecimal; this is another data representation method also known as Base-16 3. If a binary number exceeds the allocated bytes it is known as overflow	1. You will complete a series of binary calculations using the addition rules and column method 2. You will complete a series of conversions from binary to hexadecimal and from hexadecimal to binary 3. You will be able to identify an overflow in a binary addition calculation	
3	1. All pictures on a computer are made up of tiny squares called a pixel, the more pixels the better the resolution of a picture 2. Monitors and screens create colour by mixing red, blue and green together. The computer stores each colour as a hexadecimal value	1. You will use a formula to calculate image resolution of a picture without having to count every pixel 2. You will use binary and hexadecimal to assign colours to an image	Year 8 topic 3 data representation as it builds on your knowledge and understanding of binary and hexadecimal to apply it to colour values GCSE Computer science paper 2 Topic 6- students use their knowledge of images to draw using the turtle library GCSE Computer science paper 1 topic 2 students consider bitmap images and binary representation. IDEA award Animation Maker Badge
4	1. Nowadays, most household devices use a computer. Different computers have different functions depending on their use. 2. Inside a computer are a range of hardware components that work in a specific way. This includes the CPU which could be called the brains of a computer 3. Computers use logic gates, which are a series of on and off switches to operate components	1. You will be able to identify and classify computers depending on their function and use 2. You will be able to differentiate between an input and output device, considering the features and functions of the device 3. You will be able to describe and represent in a diagram the process used by a computer to function, this includes the Von Neumann FDE (Fetch, Decode, Execute) cycle of a CPU 4. You will be able to identify the different logic gates and combine them to create logic circuits depending on the scenario	Topic 2 Year7- Networks, this builds on the students understanding how computers connect to form a network to then look at how the computer operates GCSE Computer Science Paper 1 Topic 1 where students will consider algorithmic and logical thinking which is applied in Paper 2 Topic 6 though practical programming tasks. Topic 3 students will also consider the function of a CPU and operating systems. DIT Component 3 Learning Aim A which looks in hardware used to enable a computer to function IDEA award What is AI Worker badge
5	1. Python is a Computing language used to make programs.	1. You will be able to identify the basic terminology used in Python to write simple programs	Year 9 topics 3 and 4 where students will move from block based to Python GCSE Paper 2 Topic 6 students will use programming languages to complete tasks BTEC DIT Component 1 creating a user interface BTEC DIT Component 3 Learning aim A students will discuss how modern technology, and physical computing has impacted on the world around them IDEA award Virtual Reality Marker badge IDEA award Problem Solving with AI worker badge
6	1. Physical computing is when computers interact with the real world for example amazon Alexa or even a timer-controlled irrigation system on a farm 2. Micro:bits are powerful minicomputers that can be programmed to do a multitude of tasks including a timer-controlled irrigation system on a farm	1. You will be able to programme a Micro:bit to create a series of applications and games using Micro:bit: makecode 2. You will be able to recognise physical computing entities within everyday life	