

Y8 Computer Science

How to make a computer smart



Name			
Teacher			
Group		GCSE Target	

TOPIC	GCSE 1-3	GCSE 4-6	GCSE 7-9
8.1 Operating Systems & hardware	<ul style="list-style-type: none"> <input type="checkbox"/> Understands the function of the main hardware components; memory, CPU and input and output devices. <input type="checkbox"/> Understands the main functions of an operating system. <input type="checkbox"/> Understands the difference between the main operating systems. 	<ul style="list-style-type: none"> <input type="checkbox"/> Understands the advantages of using open source software. <input type="checkbox"/> Can compare OS and make a proposal to suit a particular client need. <input type="checkbox"/> Can create effective digital content, for a specific audience and purpose, by using a range of software packages and refined search techniques. 	<ul style="list-style-type: none"> <input type="checkbox"/> Makes appropriate improvements to their work as a result of feedback. <input type="checkbox"/> Understands what the fetch-decode-execute cycle is and can explain how it works.
8.2 CMD	<ul style="list-style-type: none"> <input type="checkbox"/> Understands what the command line is. <input type="checkbox"/> Can use CMD to create, delete and rename directories. 	<ul style="list-style-type: none"> <input type="checkbox"/> Can use and test more advanced command line prompts to move directories and navigate between them. 	<ul style="list-style-type: none"> <input type="checkbox"/> Understands what a virtual machine is and when it could be useful.
8.3 Binary	<ul style="list-style-type: none"> <input type="checkbox"/> Can convert binary to denary and denary to binary. <input type="checkbox"/> Understand that computers are not intelligent and have to be programmed. <input type="checkbox"/> Understand why computers use binary 	<ul style="list-style-type: none"> <input type="checkbox"/> Can work with different file sizes <input type="checkbox"/> Can do binary addition <input type="checkbox"/> Understand why overflow errors happen & give an example. <input type="checkbox"/> Understand how negative numbers are represented in binary 	<ul style="list-style-type: none"> <input type="checkbox"/> Understand why we use Two's Complement & Sign and Magnitude. <input type="checkbox"/> Be able to apply logical and arithmetic shifts
8.4 Instruction Set Design	<ul style="list-style-type: none"> <input type="checkbox"/> Can create a range of algorithms; flow chart, program code and pseudo code. <input type="checkbox"/> Understand the need for precise instructions. <input type="checkbox"/> Understands that algorithms are implemented on digital devices as algorithms. 	<ul style="list-style-type: none"> <input type="checkbox"/> Can detect and correct errors in algorithms, including debugging code. <input type="checkbox"/> Can apply logic to predict the outcomes of different algorithms. <input type="checkbox"/> Implements algorithms to create working programs. 	<ul style="list-style-type: none"> <input type="checkbox"/> Test and debug algorithms independently <input type="checkbox"/> Use sub-routines/functions <input type="checkbox"/> Uses IF/ELIF/ELSE and while loops.

8.5 How to make a computer appear smart	<ul style="list-style-type: none"> ❑ Evaluates the appropriateness and ethical implications of digital devices and programs. ❑ Understands that computers have no intelligence unless programmed. ❑ Understands that computers use inputs and outputs to interact with humans. ❑ Can create their own AI. 	<ul style="list-style-type: none"> ❑ Use a range of inputs in a program to interact effectively and in a human like way with a person. ❑ Use if, elif, else and while loops ❑ Understand different error messages in Python and be able to correct syntax errors independently. ❑ Use coding conventions such as; meaningful variable names, comments & white space. 	<ul style="list-style-type: none"> ❑ Use sequence, selection & iteration and be able to explain what they are. ❑ Understand what a logic & runtime error are and be able to give examples ❑ Be able to initialise a score and use a scoring system ❑ Use Python libraries e.g. sleep & random ❑ Explain the advantages and disadvantages of compiled/interpreted
8.6 The internet	<ul style="list-style-type: none"> ❑ Understand the difference between the internet and the world wide web. ❑ Has awareness of and can use a range of internet services e.g. VOIP. ❑ Understand the name and purpose of key hardware components. 	<ul style="list-style-type: none"> ❑ Understand the difference between different network topologies. ❑ Can explain why Sale High School uses a Star topology. ❑ Understand the difference between a hub and a switch. ❑ Knows what a network protocol is and can give examples. 	<ul style="list-style-type: none"> ❑ Knows a range of ways to report online concerns ❑ Has an awareness of digital content and references appropriately sources used. ❑ Understands the difference between a MAC and an IP address. ❑ Understands what handshaking is and how the internet works.
8.7 Sorted	<ul style="list-style-type: none"> ❑ Understands the capabilities of humans and the 'brute force' approach. ❑ Understand what a linear and binary search are. ❑ Understand what a bubble and swap sort are. 	<ul style="list-style-type: none"> ❑ Understand the benefits and drawback of different searches and sorts and can choose and justify which would be best in a given situation. ❑ Can create a program for a linear search. 	<ul style="list-style-type: none"> ❑ Know what a flag is and why it is used. ❑ Can create an algorithm for a binary search.