Grade	Computer Systems	Computational Thinking, Algorithms and Data Representation	Programming	Creative and Digital Literacy including E-Safety
8/9	**Fluently discusses** the purpose of various hardware and networking components. **Justifies** how changes to the hardware/software can affect the performance of a computer system. Can make **links** between real life scenarios and computer systems explaining how computer systems may have positive/negative effects on that scenario.	**Creates** algorithms that use and have reference to sequence, selection, iteration, decomposition, pattern recognition, generalisation, abstraction and recursion effectively.	**Creates** robust programs that make use of validation from scratch with no support implementing various key features such as inputs, outputs, variables, selection and iteration.	**Fluently discusses** the impact that technology is having on society. Can make **links** between real life scenarios and technology explaining the benefits and drawbacks of technology in these scenarios along with any laws that may be involved.
7	**Justifies** the purpose of various networking hardware, models, topologies and protocols. **Justifies** various networking models along with client-side and server-side scripting. **Justifies** why the CPU needs to operate with instructions sets in low level code. **Justifies** the need for system security to be in place on a computer system.	**Create** an algorithm with a specific programming language in mind. **Justifies** the algorithm created with reference to efficiency and robustness. **Knows** and **applies** abstraction to filter out information. **Evaluates** an algorithm using logical reasoning.	**Creates** programs from scratch with no support implementing various key features such as inputs, outputs, variables, selection and iteration.	**Collects**, **analyses** and **evaluates** data based on the needs of the user. **Justifies** how the use of technology impacts society from the social, political, legal, ethical and moral issues. **Justifies** the need for laws in computing stating specific examples. **Justifies** the need to be safe online and can create their own e-safety scenarios along with the advice that should be undertaken in that scenario.
6	**Understands** that a CPU is built up of registers, **explaining** what their main purpose is. **Understands** and **explains** the use of buses to control, send and receive data/instructions. **Explains** how the performance of the CPU is affected by it's key factors and what happens if they are changed. **Explains** the purpose of networking hardware, models, topologies and protocols and their effects on a network. **Explains** various features of specific hardware and **compares** them against each other. **Explains** specific threats to computers systems and ways to prevent them.	**Knows** and **applies** generalisation to solve multiple algorithms. **Explains** their algorithms in full using key terms such as sequence, selection, iteration, decomposition, pattern recognition and generalisation effectively.	**Programs** various iteration techniques within a program. **Combines** iteration and selection within a program.	**Creates** content independently taking into account the trustworthiness of sources along with choice of software. **Evaluates** the trustworthiness of digital content. **Analyses** the specified audience and purpose to create content that is suitable for them. **Explains** how technology impacts society. **Explains how** the copyright law, computer misuse act and data protection act are used in computing and when they might come into force. **Explains** the dangers of using online services and can give suitable advice in an e-safety scenario.
5	**Describes** the Fetch-Execute cycle. Understands and **describes** the function and main components of a computer system. **Describes** the key factors that affect a CPU's performance. **Describes** the difference between various operating systems and application software. **Describes** certain networking hardware, models, topologies and protocols. **Describes** specific threats to computer systems.	**Creates** an algorithm from scratch that uses sequence, selection and iteration. **Describes** their solution based and how they came about it. **Knows** and **applies** pattern recognition to spot similarities and differences in in a problem.	**Understands** various iteration techniques. **Programs** selection with if, elif and else.	**Knows** that different devices and services may be best suited to different tasks. **Describes** how technology can have positive and negative impacts in the world. **Describes** the trustworthiness of the sources they have used to create their content. **Describes** the copyright law, computer misuse act and data protection act. **Describe** how to stay safe online and can describe what each key term means.
4	**Understands** the Fetch-Execute cycle. **Knows** and **understands** the main functions of an operating system. **Knows** the difference between various types of networks. **Knows** the key factors that affect a CPU's performance. **Knows** some of the threats that a computer system may face.	**Knows** what tasks are best completed by humans and those best completed by computers. **Understands** and applies decomposition by breaking down problems into smaller problems. **Knows** that different solutions exist for the same problem.	**Understands** what iteration is. **Programs** selection with if and else. **Manages** variables in a program.	**Knows** how technology may have an impact in different areas such as education and work. **Knows** what device would be best suited to a specific task. **Knows** some specific laws that relate to Computing and how they may be broken. **Combines** work from different software. **Knows** what the copyright law and computer misuse act are. **Knows** the key terms in e-safety such as cyberbullying, sexting, grooming, reporting etc.
3	**Understands** that computers can use various input devices to collect data. **Understands** the difference between various hardware and software. **Understands** the difference between the internet and the world wide web. **Understands** that computer are susceptible to threats.	**Designs** algorithms that use repetition and two way selection (if, elif and else.) **Understands** flowchart shapes and how to use them. **Uses** logical reasoning to predict outputs.	**Understands** what a variable is. **Understands** what an input command is. **Programs** variables, inputs and outputs effectively. **Understands** what selection is.	**Collects**, **organises** and **presents** data and information in digital content. **Combine** software packages to create digital content. **Understands** ways of communicating online. **Understands** what the copyright law is. **Understand** dangers of using online services. **Knows** different ways of communicating online.
1/2	**Knows** that computers are machines that follow instructions called a program. **Recognises** that a range of devices can be classed as a computer system. **Recognises** various input and output devices.	**Remembers** the term algorithm and that they are followed to create programs. **Remembers** that computers need to follow precise instructions. **Remembers** flowchart shapes and their use. **Designs** simple algorithms that uses both sequence and selection. **Predicts** the outcome of algorithms. **Knows** that computers use data to store and process information. **Knows** that data can be represented in different ways.	**Understands** the term syntax. **Knows** what a programming language is. **Programs** a basic sequence of instructions like print.	**Understands** how to create, edit and store files and folders. **Understands** how technology may be used in the world. **Shows** an awareness of high quality content. **Uses** multiple software to carry out various tasks. **Understands** what the main software applications are used for. **Understands** that there are laws that are used in Computing. **Understands** the term e-safety and knows what to do to stay safe.