Topic: 8.6 System Security	Duration: 5 weeks	Composite: Project

Key vocabulary:	Core knowledge questions	Powerful knowledge crucial to commit to long term memory	Links to previous and future topics
Anti-Virus Brute Force Cyberbullying DDoS Encryption Firewall Hacking Infect Malware Packet Sniffing Phishing Phishing Protected Replicate Secure Social Engineering Spyware SQL Injection System Security Trojan Trolling Unauthorised Virus Worm	12. What is system security? System security is the process of ensuring that a network or data cannot be accessed, manipulated or damaged by someone with unauthorised access. 13. Why do networks need to be secure? Networks need to be secure in order to protect data, privacy of others and sometimes finances of businesses or individuals 14. What is malware? Malware stands for malicious software. They are pieces of program code designed to steal, disrupt or destroy data or systems on a network. 15. What is a virus? A virus is a type of malware that is designed to replicate and infect other computers on a network. It is prevented by regularly updating anti-virus software 16. What is anti-virus software? Anti-virus software is essentially a database containing references to all known virus programs which. The software scans all files on a computer system in order to check code against this database. If a suspected virus is found it will then be quarantined (isolated from rest of system) and then deleted. 17. What is a trojan? A Trojan is a type of malware that enters a system pretending to be a different type of file. Once inside it acts like a virus to infect a system or network. 18. What is a worm? A Worm is a standalone program that does not need to attach itself to an existing program in order to spread. 19. What is social engineering? Social Engineering means tricking or persuading individuals into revealing confidential or personal information such as passwords or bank details 20. What is spyware? Spyware is a type of malware which is used to monitor actions or activity on a system or network. It often involves keylogging which records button presses in order to obtain passwords. 21. What is hacking? Hacking is an attempt to unlawfully access a computer system that someone is not authorised to have access to. 22. What is phishing? Phishing is the use of lookalike emails or websites to fool users into entering personal or private information. 23. What is a DDoS? DDoS (Distributed Denial of Service) is an attack used to disrupt and overload a computer system or network. It uses bots to persistently request access until the system cannot cope. 24. What is meant by brute force hacking? Brute Force hacking is where a user tries to guess a password to gain access to an account or system. It does so by using a dictionary or database with known passwords to try and find a correct one. 25. What is network sniffing? Network / Packet sniffing is where a program is set up to monitor a networks data flow to pick out packets of data to try and hijack the data contained. 26. What is SQL injection? SQL injection is where a user enters program code into the input fields of a login system to try and force entry to a system / access to data.	• System security is the process of ensuring that a network or data cannot be accessed, manipulated or damaged by someone with unauthorised access. • Networks need to be secure in order to protect data, privacy of others and sometimes finances of businesses or individuals • Malware stands for malicious software. They are pieces of program code designed to steal, disrupt or destroy data or systems on a network. • Anti-virus software is essentially a database containing references to all known virus programs which. The software scans all files on a computer system in order to check code against this database. If a suspected virus is found it will then be quarantined (isolated from rest of system) and then deleted. • Hacking is an attempt to unlawfully access a computer system that someone is not authorised to have access to.	• Links to **8.5 Networks** unit • Builds upon the foundations of how networks are exploited and how to ensure prevention and protection of data learnt in year 7 • Links to GCSE content around cyber security

Topic: 8.7 Searching and Sorting Algorithms	Duration: 5 weeks	Composite: Presentation

Key vocabulary:	Core knowledge questions	Powerful knowledge crucial to commit to long term memory	Links to previous and future topics
Algorithm Binary Search Bubble Sort Bubble Sort Bucket Sort Bucket Sort Criteria Data Data Type Database Flowchart Keyword Program Pseudocode Searching Serial Search Sorted Sorting	27. What is an algorithm? An Algorithm is a sequence of logical instructions for carrying out a task. In computing these are often used to design computer programs 28. Why do we use Searching algorithms? We use Searching Algorithms because we often need to find one particular item of data amongst many. For example, you may need to find someone's phone number on your phone. 29. Why do we use sorting algorithms? A sorting algorithm will put items in a list into an order, such as alphabetical or numerical order to make data more efficient when stored. 30. What types of search algorithm are there? Linear and Binary are types of searching algorithms. 31. What is a Linear Search? A simple method of searching, in which the search moves from one item to the next in sequence, until either a match is found, or end of the data is reached with no match found 32. What is a Binary Search? A method of searching in which the data being searched is halved with every step until correct or no value is found. 33. What types of sorting algorithm are there? Merge, Bubble and Insertion are examples. 34. What is a Bubble Sort? A sorting algorithm that repeatedly passes through a list to be sorted, comparing and swapping items that are in the wrong order 35. What is a Merge Sort? A merge sort uses a technique called divide and conquer. The list is repeatedly divided into two until all the elements are separated. Pairs of elements are then compared, placed into order and combined. The process is then repeated until the list is recompiled as a whole. 36. What is an Insertion sort – An Insertion sort compares values in turn and 'inserts' a value in the correct place when it finds a value that is lower than it.	• Algorithms are a sequence of logical instructions that can be represented either by Pseudocode or Flowcharts • Sorting algorithms are needed to efficiently sort data items in a specific order, there are many sorting algorithms, two are Bubble and Bucket • Bubble sorts repeatedly pass through a list, comparing and swapping items that are in the wrong order • Merge sorts separate data into individual pieces before recompiling into groups which are also then sorted before merging into one list. • Insertion sorts compare values and insert values into the correct place. • Searching algorithms are needed to enable specific items of data to be sought from a list of many, two are Serial and Binary • Linear searches move from one item to the next in sequence • Binary searches halve data with every step	• Builds on skills gained from 8.4 Programming Development using sequencing, selection and iteration. • Utilises computational thinking and skill building for KS4 Computer Science.