# Curriculum Knowledge Map

## Computing/CS:

SUCCESSFUL CREATIVE HAPPY

| Year 11 | AUTUMN | | SPRING | | SUMMER | |
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| **Computational Thinking** | Programming Part 6 | Programming Project | Databases & SQL | EXAM PREP | EXAM PREP | |
| | Access and modify existing data, file handling. | Complete a complex programming project | Describe a database and list its key terms. Determine the difference between a flat file and a relational database. Use structured query language (SQL) to retrieve and update data in a database. | | | |
| **Declarative** *What should they know?* | The use of basic file handling operations: <br>o Open <br>o Read <br>o Write <br>o Close <br>o The purpose of external data files <br>o The meaning of CSV files | o Learners complete their final programming challenge of the unit. This is their formal assessment for the unit. The project is very challenging, but it does cover everything that they have learnt over this unit. | o Key terminology required to be able to use SQL to search and update a database. <br>o SQL commands: <br>o SELECT <br>o FROM <br>o WHERE <br>o The purpose of INSERT, UPDATE and DELETE queries. | | | |
| **Procedural** *What should they be able to do?* | o Read an external data file. <br>o Write to an external data file. <br>o Append to an external data file. <br>o Read data from a CSV file. <br>o Use the split () method. <br>o Use the join () method. <br>o Write data from a 1D list to a CSV file. <br>o Write data from a 2D list to a CSV file. <br>o Append to a CSV file | o Determine the good habits of a program. <br>o Explore alternative methods for programming solutions. <br>o Design a challenging program. <br>o Create a challenging program. <br>o Test and refine a challenging program | o Describe a database. <br>o Define database key terms (table, record, field, primary key, foreign key) <br>o Describe the function of SQL. <br>o Use SQL to retrieve data from a table in a relational database. <br>o Use SQL to retrieve data from more than one table in a relational database. <br>o Describe the function of different data types. <br>o Use SQL to insert data into a relational database. <br>o Use SQL to update data into a relational database. | | | |

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| | | | o   Use SQL to delete data from a relational database.  o | | | |
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| **Disciplinary Literacy** (Tier 3 Vocab) | Records Dictionaries Files Read Write Open CSV Append Split | **Consolidate all disciplinary literacy from units:** • Algorithms Part 1 • Algorithms Part 2 • Programming: Sequence • Programming: Selection • Programming: Iteration • Programming: Strings & Lists • Programming: File Handling | o   Database o   Data inconsistency o   SQL o   Structured Query Language o   Records o   Fields o   Tables o   Primary Key o   Foreign Key | | | |
| **Assessment** | | | This unit includes a final summative assessment to be used at the end of the unit | | | |
| **Computer Systems** | Impacts of technology | Networks Part 1 | Networks Part 2 | Security | EXAMP PREP | |
| | Determine the ethical, legal, environmental, and cultural impacts of technology | Describe network components. Explain connectivity and distinguish between the various types. | Describe the four layers of the TCP/IP model. Protect a network from threats. | Describe the various ways that users and organisations can be affected by cyberattacks. Demonstrate how organisations can prevent cyberattacks. | | |
| **Declarative** *What should they know?* | o   Technology introduces ethical, legal, cultural, environmental and privacy issues. o   Knowledge of a variety of examples of digital technology and how these impact on society o   The purpose of each piece of legislation and the specific actions it allows or prohibits. o   The need to license software and the purpose of a software licence. o   Features of open source (providing access to the source code and the | o   The definition of a Computer Network o   The role of clients and servers within a network o   The difference between PAN's LAN's and WAN's o   The purpose of computer networks o   The range of hardware available/required regarding computer networks. o   The term topology and the characteristics of each available topology o   The characteristics, advantages and disadvantages of different methods of data | o   How and why the internet was created and how it works now. o   Web browsers are used to access the WWW using DNS to find the IP of each website. o   How packets are transmitted across networks. o   The different types of Domains Servers available o   The term protocol and common networking protocols that are used whilst communicating over a network. o   The concept of layers | | | |

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| | ability to change the software)<br>o Features of proprietary (no access to the source code, purchased commonly as off-the-shelf | transmission (wired/wireless)<br>o Network performance can be affected by a number of factors. | o The importance of keeping data safe on networks and why networks need to be protected. | | | |
| **Procedural**<br>*What should they be able to do?* | o Apply the terms 'privacy', 'legal', 'ethical', 'environmental', 'cultural'.<br>o Explain data legislation.<br>o Explain the term 'stakeholder'.<br>o Explain the right to be forgotten.<br>o Distinguish between creative uses and infringement of copyright.<br>o Define 'downtime' and explain the associated impact on an organisation.<br>o Identify the implications of having personal data online.<br>o Explain the Freedom of Information Act (2000)<br>o Define 'computer misuse' and the associated offences.<br>o Identify situations that would be classified as an offence under the Act.<br>o Explain what is meant by the 'digital divide' and measures to mitigate its effect.<br>o Identify positive and negative aspects of the use of mobile technology.<br>o Explain the social and environmental impacts of social media.<br>o Explain the positive and negative effects of online content. | o Define a computer network.<br>o Discuss the advantages and disadvantages of computer networks.<br>o Describe the role of a computer in a peer-to-peer network.<br>o Describe the role of a computer in a client–server network.<br>o Describe the purpose of a PAN, LAN, and a WAN<br>o Describe the tasks performed by the network hardware: wireless access point, router, switch, hub, NIC, and bridge.<br>o Define a MAC address.<br>o Draw and describe a star, bus, mesh, and ring topology.<br>o Describe the advantages and disadvantages of the star, bus, mesh, and ring topologies.<br>o Select an appropriate topology for a given scenario.<br>o Define a wired and a wireless network.<br>o Define transmission media.<br>o Describe the attributes of | o Describe the internet as a network of computer networks.<br>o Describe the function of an IP address.<br>o Describe a DNS and its role in the conversion of a URL to an IP address.<br>o Describe the role and function of a web browser.<br>o Describe how servers are used for hosting services across the internet.<br>o Describe the role of web servers and clients.<br>o Describe how the cloud provides services for software and storage.<br>o List the advantages and disadvantages of the cloud.<br>o Determine the need for standards in network communications.<br>o Define the term network protocol.<br>o Define the purpose and common use of the network protocols: Ethernet, WiFi, HTTP, HTTPS. FTP, POP, SMTP, and IMAP | | | |

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| | o Explain the environmental effects of the use of technology.<br>o Explain the ethical impact of using algorithms to make decisions.<br>o Explain the ethical issues surrounding the use of AI in society | fibre optic and copper cables used in wired networks.<br>o Describe Bluetooth as a mode of connection.<br>o Discuss the advantages and disadvantages of wireless networks compared to wired networks.<br>o Describe the factors that affect network performance (bandwidth, range, latency, number of devices)<br>o Determine how network speeds are measured and construct expressions involving file size, transmission rate, and time.<br>o Determine methods of routing traffic on a network and calculation of routing costs | o Describe the four layers of the TCP/IP model.<br>o Determine the need for and importance of network security.<br>o Identify different forms of attacks on networks (social engineering, malicious software)<br>o Explain network security methods. | | |
| **Disciplinary Literacy**<br>*(Tier 3 Vocab)* | o Privacy<br>o Legal<br>o Ethical<br>o Environmental<br>o Cultural<br>o Legislation<br>o Stakeholder<br>o Right to be forgotten<br>o Copyright<br>o Freedom of information act<br>o Computer Misuse<br>o Downtime<br>o Digital Divide<br>o Privacy<br>o Surveillance | o Network<br>o Node<br>o Client<br>o Server<br>o Peer-to-peer<br>o Client-Server<br>o PAN<br>o LAN<br>o WAN<br>o WAP<br>o Router<br>o Switch<br>o HUB<br>o NIC<br>o MAC Address<br>o Topologies<br>o STAR | o Internet<br>o IP Address<br>o DNS<br>o URL<br>o Web Browser<br>o Servers<br>o Hosting<br>o Web Servers<br>o Clients<br>o Cloud<br>o Protocol<br>o Ethernet<br>o WiFi<br>o HTTP<br>o HTTPS<br>o FTP<br>o POP | | |

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| | | o    MESH<br>o    Wired<br>o    Wireless<br>o    Transmission<br>o    Optic<br>o    Copper<br>o    Bluetooth<br>o    Bandwidth | o    SMTP<br>o    IMAP<br>o    TCP/IP | | |
| **Assessment** | Students engage in a comprehensive end-of-unit assessment, covering aspects from each of the preceding seven lessons. This includes the previous lessons covered in legal, cultural, environmental, and ethical aspects of the impact of technology. | | Recall knowledge of networks through a final, summative assessment - A multiple choice summative assessment has been created for this unit. | | |

# Additional

Education for a Connected World (publishing.service.gov.uk)