



# YEAR 10 GCSE COMPUTER SCIENCE SUMMER TERM 3 – PAPER 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning – Network Connections and Protocols

Curriculum Intent	Pupils will be taught the following National Curriculum guidelines this term:
<p><b>Skills/Assessment Objective Links</b></p>	<p><b>At the end of this Unit all students should be able to:</b></p> <ul style="list-style-type: none"> <li>• Define a Wide Area Network</li> <li>• Describe the nature of the Internet as a worldwide collection of computer networks</li> <li>• Describe the difference between a Local Area Network and a Wide Area Network</li> <li>• Describe star and mesh network topologies</li> <li>• Understand wireless modes of connection, including:               <ul style="list-style-type: none"> <li>– Wi-Fi</li> <li>– Bluetooth</li> </ul> </li> <li>• Explain the need for Wireless Access Points to create wireless hotspots</li> <li>• Describe what is meant by:               <ul style="list-style-type: none"> <li>• Hosting</li> <li>• The Cloud</li> </ul> </li> <li>• Describe the factors that affect network performance</li> <li>• Describe the uses of communications protocols including:               <ul style="list-style-type: none"> <li>– HTTP</li> <li>– HTTPS</li> </ul> </li> </ul> <p><b>Most students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Explain the need for IP addressing of resources on the Internet and how this can be facilitated by the role of DNS services</li> <li>• Understand the need for Network Interface Cards and the uses of MAC addressing</li> <li>• Explain packet switching</li> <li>• Describe routers and switches needed to connect stand-alone computers into a Local Area Network</li> <li>• Explain the use of Ethernet standards to transmit data over a wired network</li> <li>• Understand how encryption is used to secure data across network connections</li> <li>• Explain the role of computers in client-server and peer-to-peer networks</li> <li>• Explain the advantages and disadvantages of client-server and peer-to-peer networks</li> <li>• Explain the advantages and disadvantages of various transmission media</li> <li>• Describe the uses of communications protocols including:               <ul style="list-style-type: none"> <li>– FTP</li> <li>– POP</li> <li>– IMAP</li> <li>– SMTP</li> </ul> </li> </ul> <p><b>Some students will be able to:</b></p> <ul style="list-style-type: none"> <li>• Explain the concept of layers in the TCP/IP protocol stack</li> <li>• Describe the uses of communications protocols including:               <ul style="list-style-type: none"> <li>– TCP/IP</li> </ul> </li> <li>• Explain the advantages and disadvantages of various transmission media</li> </ul>
<p><b>Numeracy</b></p>	<p>Bit, nibble, byte, kilo, mega, giga, tera, peta, binary, bit depth, sample rate, binary shift, shift left, shift right,</p>
<p><b>Literacy</b></p>	<p><b>Vocabulary Tier 3:</b> LAN, Local Area Network, WAN, Wide Area Network, bandwidth, latency, Wireless access points, routers, switches, NIC, Network Interface Controller/Card, Transmission media, DNS, Domain Name Server, Hosting, The Cloud, Web servers and clients, star network, mesh network, topology, IP address, web server, file server, wired network, wireless network, Ethernet, Wi-Fi, Bluetooth, encryption, IP addressing, MAC addressing, TCP/IP, Transmission Control Protocol/Internet Protocol, FTP, File Transfer Protocol, POP, Post Office Protocol, IMAP, Internet Message Access Protocol, SMTP, Simple Mail Transfer Protocol, layers, IPv4, IPv6, MAC address.</p> <p><b>Vocabulary Tier 2:</b> Network, Storage, WWW,</p>

	<p><b>Reading:</b> Worksheets, presentations, answer sheets, exam questions, mark scheme, further reading for homework</p> <p><b>Writing:</b> Answer on the worksheet via word</p> <p><b>Oracy:</b> listening and using tier 3 words</p>
Becoming future ready	<p><b>Careers/Employability:</b></p> <ul style="list-style-type: none"> <li>▪ Software Architect.</li> <li>▪ Data Scientist.</li> <li>▪ Machine Learning Engineer.</li> <li>▪ Blockchain Developer</li> <li>▪ Cybersecurity Engineer.</li> <li>▪ Cloud Solutions Architect.</li> <li>▪ AI Research Scientist.</li> <li>▪ Full-Stack Developer.</li> </ul>
Adaptation	Throughout this topic, quality first teaching will provide differentiation:
QFT/SEND Provision	<p><b>By product:</b> Learners are asked to present outcomes in a different way via pieces of writing, targeted questioning, models and drawings and speaking.</p> <p><b>By resource:</b> Worksheets are well presented and accessible. Instructions are clearly outlined and separate from the information so that pupils know where to begin and end. Handouts are differentiated by outcome. Resources used will appeal to the range of preferred learning styles of pupils e.g. visual, auditory or kinesthetic learners. Scaffolding of tasks – word frames.</p> <p><b>By Intervention:</b> By providing different levels of supervision and support</p> <p><b>By Progressive Questioning:</b> Exploring pupils' understanding through interactive dialogue using Blooms Taxonomy.</p> <p><b>By Grouping:</b> According to prior attainment, gender, social preference, preferred learning style.</p> <p><b>By Task:</b> Pupils identify targets which are meaningful to them via feedback sheets</p> <p><b>By Offering Optional Activities:</b> In class or as homework, to extend learning.</p> <p>This QFT/SEND provision will be explicit within the lesson by lesson schemes of work.</p>
Implementation Curriculum Delivery	To be able to:
Learning Outcomes (Knowledge)	<p><b>Topic 1 The Internet and WANs</b></p> <p>Define a Wide Area Network</p> <p>Describe the nature of the Internet as a worldwide collection of computer networks</p> <p>Explain the need for IP addressing of resources on the Internet and how this can be facilitated by the role of DNS services</p> <p>Understand the need for Network Interface Cards and the uses of MAC addressing</p> <p>Explain packet switching</p> <p><b>Topic 2 Local Area Networks</b></p> <p>Describe the difference between a Local Area Network and a Wide Area Network</p> <p>Describe star and mesh network topologies</p> <p>Describe routers and switches needed to connect stand-alone computers into a Local Area Network</p> <p>Explain the use of Ethernet standards to transmit data over a wired network</p> <p>Explain the concept of virtual networks</p> <p><b>Topic 3 Wireless networking</b></p> <p>Understand wireless modes of connection, including:</p> <ul style="list-style-type: none"> <li>– Wi-Fi</li> <li>– Bluetooth</li> </ul> <p>Explain the need for Wireless Access Points to create wireless hotspots</p> <p>Understand how encryption is used to secure data across network connections</p> <p><b>Topic 4 Client-server and peer-to-peer networks</b></p> <p>Explain the role of computers in client-server and peer-to-peer networks</p> <p>Explain the advantages and disadvantages of client-server and peer-to-peer networks</p> <p>Describe what is meant by:</p> <ul style="list-style-type: none"> <li>– Hosting</li> </ul>



– The Cloud  
Explain the advantages and disadvantages of various transmission media  
Describe the factors that affect network performance

**Topic 5 Standards, protocols and layers**  
Describe the uses of communications protocols including:

- HTTP
- HTTPS
- FTP
- POP
- IMAP
- SMTP
- TCP/IP

Explain the concept of layers in the TCP/IP protocol stack

End of unit assessment

Current learning to be developed in the future within:	
Assessment	See assessment maps for formative and summative assessment opportunities.
Impact	<p>Review assessment results and target pupils that require further support via:-</p> <ul style="list-style-type: none"><li>• Learning conversation</li><li>• Changing seating plan</li><li>• Plan lessons to address areas of concern in assessment</li><li>• Targeted homework based on low performance areas identified in the assessment and marked pieces</li><li>• Stretch and challenge high ability pupils by identifying ambitious next steps to expand knowledge</li></ul> <p>Create a feedback sheet for each student Each student identifies areas of Green, Amber and Red using Mark Assessment on their feedback sheet Complete NOW task on areas identified as Amber and Red</p>