Connected Worlds: Understanding Computer Networks

1. A network is a collection of computers and devices connected together to share resources, such as files, printers, or internet access. (2 marks)

Working: Requires two points: 1) multiple devices connected, 2) sharing resources/data.

1 mark for mentioning connected devices, 1 mark for mentioning sharing resources.

2. A router directs data traffic between different networks or devices, ensuring that information reaches the correct destination. (2 marks)

Working: Focus on the 'directing' or 'routing' function of data packets.

1 mark for directing traffic/data, 1 mark for ensuring it reaches the right place.

3. A server is a powerful computer that provides services or resources to other devices. A client is a device (like a laptop or tablet) that requests and uses those services. (3 marks)

Working: Distinction between provider (server) and requester (client).

1 mark for defining server, 1 mark for defining client, 1 mark for explaining the relationship/difference.

4. These pieces are called packets. They are used because it is more efficient; if one packet is lost, only that small part needs to be resent, and it prevents one large file from blocking the network. (4 marks)

Look for: Identification of 'packets' and the concept of efficiency/reliability.

Good: They are called packets. It makes it easier to send big files.

Better: They are called packets. It is better because if a piece gets lost, you don't have to send the whole file again.

Best: They are called packets. Breaking files into packets is more efficient because it prevents network congestion and allows for error correction if a single packet is lost during transmission.

What moves an answer up: Moving from simple description to explaining the technical benefit of reliability and traffic management.

5. No, they are not the same. The Internet is the global infrastructure of connected networks, while the World Wide Web is a service that runs on the Internet, consisting of linked pages. (4 marks)

Look for: Clear distinction between infrastructure (Internet) and service (WWW).

Good: No, they are different. The Internet is the network and the Web is the websites.

Better: No, they are not the same. The Internet is the hardware and cables connecting computers, while the World Wide Web is the collection of pages we see through a browser.

Best: No, they are not the same. The Internet is the global infrastructure of interconnected networks, whereas the World Wide Web is an application that uses the Internet to share information via HTTP.

What moves an answer up: Using precise terminology like 'infrastructure' and 'application' elevates the answer.

6. Benefits: Flexibility (moving devices around) and no need for messy cables. Drawback: Potential for slower speeds or interference compared to a wired connection. (5 marks)

Look for: Two benefits and one drawback.

Good: Benefits are no wires and you can move around. A drawback is it might be slower.

Better: Benefits are that you don't need cables, which is tidier, and you can connect devices anywhere in the library. A drawback is that the signal might be weaker through walls.

Best: Benefits include increased mobility for users and reduced installation costs for cabling. A drawback is that wireless networks are more susceptible to interference and security risks compared to wired ones.

What moves an answer up: Adding technical context like 'interference' and 'installation costs' shows deeper understanding.

7. The computers would lose access to shared files and central services. This happens because the server acts as the 'hub' or provider; without it, the clients have no source to request data from. (5 marks)

Look for: Understanding of the dependency between client and server.

Good: The computers would stop working because they can't get files.

Better: The computers would lose access to the library's shared resources because they rely on the server to store and provide that information.

Best: The computers would lose access to shared resources and services. Because the server acts as the central provider, the clients cannot retrieve data or host applications without the server's active connection.

What moves an answer up: Explaining the 'central provider' role demonstrates a clear grasp of network architecture.

What a secure answer looks like

A secure answer uses the vocabulary provided in the word bank correctly and demonstrates an understanding of the client-server relationship. Encourage pupils to think about the 'why' behind network design.

If your child is stuck

Ask the child to imagine the library as a restaurant: the server is the kitchen (providing the food/data) and the computers are the tables (the clients waiting for service).

Common mistakes to watch for

Many children confuse the Internet with the World Wide Web, thinking they are synonyms. Another common error is assuming that a network must be wireless.