

Kit's Computing Challenge: Navigating Networks

Learning objective: To understand the fundamental components of computer networks, including how devices connect, communicate, and share resources.

Read each question carefully and use your knowledge of network infrastructure to provide detailed, scientific explanations. Use the word bank to help structure your answers.

N/A

Word bank: Server · Router · Client · Wireless · Packet · Network · Internet · Bandwidth

1. Kit is designing a network for a local library. Explain why a 'Router' is considered the essential 'traffic controller' of a network. What might happen if the router stopped functioning correctly? (3 marks)

2. Compare and contrast a 'Client' device (such as a laptop) and a 'Server'. In what way does their relationship facilitate the sharing of digital resources? (3 marks)

3. Data is often sent across a network in small 'packets'. Justify why it is more efficient to break a large file into smaller packets rather than sending the entire file at once. (2 marks)

4. If a school decides to switch from a wired connection to a wireless network, discuss one significant advantage and one potential security challenge they might face. (2 marks)

5. Explain the concept of 'Bandwidth' using the analogy of a road. If a network is 'congested', what does this mean for the data travelling through it? (2 marks)

6. If you were tasked with connecting three separate buildings in a village to a single central server, what hardware would you need to ensure they could communicate securely? Draw a simple block diagram or describe the configuration. (3 marks)

Draw: Draw a labelled diagram of a small home network. Include a router, a server, and at least three client devices (like a tablet, a desktop computer, and a printer). Use arrows to show how data flows between them.



Extension challenge: Imagine you are building a network for a new, remote research station in the Arctic. Research and write a short proposal explaining how you would connect the station to the outside world, considering the limitations of the environment. Would you use satellite, fibre optic, or wireless links? Justify your choice based on reliability and speed.