

Kit's Computing Challenge: Unravelling Networks

Learning objective: To explain the function of computer networks and identify the roles of hardware in connecting devices.

Use the writing frame below to explain how computers communicate within a network. Think about how Kit the fox might describe the invisible pathways of data. Use the word bank to help you construct detailed, technical sentences.

A computer network is essentially a collection of interconnected devices that share resources and exchange information through a structured system of cables or wireless signals.

Word bank: infrastructure · transmission · interconnected · consequently · furthermore · server · router · bandwidth · local area network (LAN) · packets of data

1. The Purpose of Networks: Start by defining what a network is and why it is more efficient than using a single, isolated computer. Consider how sharing hardware like printers or files benefits a community... (3 marks)

2. Hardware Roles: Explain the specific function of a router in managing traffic. How does it ensure that the correct 'packets of data' reach the intended destination without colliding? (4 marks)

3. LAN vs. WAN: Compare and contrast a Local Area Network (LAN) with a Wide Area Network (WAN). Why might a school use a LAN, whereas the internet requires a global WAN? (4 marks)

4. Justify Your Answer: If the school's network server were to experience a technical failure, what might happen to the accessibility of shared files? Justify why a backup system is essential. (3 marks)

5. Security and Ethics: Explain why secure passwords and firewalls are necessary components of any network infrastructure. How do these protect the integrity of the data being transmitted? (3 marks)

6. Creative Extension: Imagine you are designing a network for a futuristic library. Describe the layout, identifying which devices would be connected and how they would interact to help people find books. (5 marks)

Extension challenge: Research how fibre-optic cables differ from copper wires in terms of transmission speed. Write a short paragraph explaining why fibre-optics are the preferred choice for modern high-speed internet networks.