Kit’s Computing Guide: Decoding Binary

Learning objective: To explain how computers use binary code to store and process information, and to convert denary numbers into binary.

Use this writing frame to create your own explanation guide. Follow the paragraph prompts and use the vocabulary bank to ensure your writing is clear and technical. Remember to explain why binary is important for computers.

Computers are incredibly fast at solving complex problems, but deep down, they only understand two states: on and off.

Word bank: binary · denary · base-2 system · on and off · electrical signals · transistors · bits · processing · consequently · furthermore · specifically · in contrast

1. Introduction: What is the binary system and why do computers use it instead of our normal number system? Start by saying: 'Unlike humans who use a base-10 system, computers rely on binary because...' (2 marks)

2. The Language of Bits: Describe how a computer uses '1' and '0' to represent information. Explain: 'In the world of computing, a bit is the smallest unit of data. A 1 represents... while a 0 represents...' (3 marks)

3. The Power of Two: Explain how binary numbers grow. Use this starter: 'As we move from right to left in a binary sequence, the value of each position doubles. For example, the positions represent...' (3 marks)

4. Application: Convert the denary number 13 into binary. Show your working: 'To represent the number 13 in binary, I need to add the values of... which results in the binary code...' (2 marks)

5. Conclusion: Why is it helpful for Kit the fox to understand binary when building a computer programme? Write: 'Understanding binary is a vital skill for computing because...' (2 marks)

Extension challenge: Create a 'Binary Secret Message' card. Choose a letter of the alphabet, find its ASCII value, convert it to 8-bit binary, and challenge a partner to decode it using your explanation guide.