Cracking the Binary Code: How Computers Think

Learning objective: I can explain how computers use binary to store and process information.

About 15 minutes. Grown-up tip: Encourage your child to explain the concept to you out loud before they start writing.

In this writing task, you will explain binary to a Year 4 student. Use the structure below to help you. Remember to explain that binary is a base-2 system using only 0s and 1s. Example: 'Just as we use ten digits (0-9), computers use only two states: on and off.'

Deep inside every computer, tablet, and smartphone, there is a secret language that does not use letters at all.

Word bank: binary · data · base-2 · electrical current · sequence · transmission · representation · specifically · furthermore · consequently

1. Introduction: Describe what binary is and why it is the fundamental language of all digital devices. (3 marks)

2. The Two States: Explain the relationship between the numbers 0 and 1 and the electrical currents inside a computer circuit. (3 marks)

3. Encoding Data: How do computers turn a string of binary numbers into a single letter or a pixel of colour on your screen? (3 marks)

4. Comparison: Why is binary more efficient for a machine than the decimal system humans use for maths? (2 marks)

5. Conclusion: Summarise how this simple system allows us to watch videos, play games, and write documents. (2 marks)

Extension challenge: Research how 8 bits make a 'byte'. Write a short paragraph explaining why computers need groups of eight to represent the full alphabet.



I did it! Name: _____ Date: _____

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