Kit’s Binary Code Breaker

Learning objective: I can convert denary numbers into binary and understand how computers store data.

About 15 minutes. Grown-up tip: Remind your child that binary is just a different way to count using powers of two.

Computers use binary, a base-2 system with only 0s and 1s. Each 'bit' represents a value, doubling each time from right to left: 8, 4, 2, 1. To convert a denary number to binary, fill the place values. Example: To make 6, you need one 4 and one 2 (4 + 2 = 6). So, 6 in binary is 0110. Fill in the table below to complete the binary codes for each number.

Word bank: binary · bit · denary · base-2 · value

1. Complete the binary grid for the number 3. (Place values: 8, 4, 2, 1) (2 marks)

2. Complete the binary grid for the number 5. (Place values: 8, 4, 2, 1) (2 marks)

3. Complete the binary grid for the number 9. (Place values: 8, 4, 2, 1) (2 marks)

4. What is the largest number you can represent using only four bits (8, 4, 2, 1)? (1 mark)

5. If a computer shows the binary code 1011, what is the denary number? (2 marks)

Draw: Kit the fox sitting at a desk in a futuristic library, looking at a screen filled with glowing ones and zeros, with a happy and clever expression.

Extension challenge: Try to work out the binary for the number 15. Can you write a secret code for your friend using 4-bit binary for the letters A=1, B=2, C=3, and D=4?



I did it! Name: _____ Date: _____

Too easy? Try Greater Depth. Too tricky? Try Supported. More at bookflik.com/resources