Kit’s Binary Code Challenge

Learning objective: I can understand how computers use binary to store data and convert numbers between decimal and binary.

About 15 minutes. Grown-up tip: Encourage your child to draw the powers of 2 (1, 2, 4, 8) above their binary numbers to help them calculate the values.

Kit the fox uses binary to solve puzzles. Remember, binary is a base-2 system using only 0 and 1. Each position represents a power of 2 (1, 2, 4, 8, 16...). Example: To make 5, we use 4 + 1, which is 101 in binary.

Answer Key: 1. A, 2. B, 3. True, 4. 10, 5. 110, 6. C, 7. 0111, 8. 8, 9. False, 10. D. Explanation: A byte is 8 bits. Binary uses powers of 2 starting from the right. 110 is (4*1) + (2*1) + (1*0) = 6.

Word bank: Bit · Byte · Binary · Base-two · Denary

1. 1. What are the two digits used in binary? A) 1 and 2*, B) 0 and 1*, C) 0 and 9, D) Yes and No. (1 mark)

2. 2. In the binary number 1011, what is the value of the furthest digit on the right? A) 8, B) 1*, C) 2, D) 4. (1 mark)

3. 3. True or False: Computers use binary because electricity can be either 'on' or 'off'. (1 mark)

4. 4. What is the decimal number 2 represented as in binary? (1 mark)

5. 5. Convert the decimal number 6 into a 3-bit binary code. (1 mark)

6. 6. How many bits make up one byte? A) 2, B) 4, C) 8*, D) 16. (1 mark)

7. 7. What is the binary representation of the number 7? (1 mark)

8. 8. If you have the binary number 1000, what decimal number is this? (1 mark)

9. 9. True or False: The number 12 can be written in binary as 101. (1 mark)

10. 10. Which of these is the largest number? A) 0111, B) 1000, C) 1001, D) 1010* (1 mark)

Draw: Kit the fox sitting in a high-tech woodland den, looking at a screen displaying glowing 1s and 0s.

Extension challenge: Can you write your age in binary? How would you write the current year (2024) in binary code? (Hint: You will need more than 8 bits!)



I did it! Name: _____ Date: _____

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