

Max's Mathematical Cube Challenge

Learning objective: To recognise and calculate cube numbers up to 10 cubed and understand their relationship to three-dimensional shapes.

Help Max the monkey solve these cube number puzzles! Remember, a cube number is the result of multiplying a whole number by itself and then by itself again ($n \times n \times n$). Read each question carefully and show your working out.

Answer Key: 1) C (27), 2) True, 3) 64, 4) B (125), 5) False ($10 \times 10 \times 10 = 1000$), 6) 8, 7) C (216), 8) True, 9) 1, 10) 343. Justification for higher-order thinking: A cube number is always the volume of a cube with integer side lengths. If a side length doubles, the volume increases by a factor of eight (2 cubed).

Word bank: Cube · Product · Dimension · Volume · Integer · Cubed · Factor · Calculation

1. Max has a stack of wooden blocks. If he creates a cube with a side length of 3, how many blocks does he use? A) 6, B) 9, C) 27*, D) 12 (1 mark)

2. True or False: The number 8 is a cube number because $2 \times 2 \times 2 = 8$. (1 mark)

3. What is the value of 4 cubed (4^3)? (1 mark)

4. Which of these is the correct calculation for 5 cubed? A) $5+5+5$, B) $5 \times 5 \times 5^*$, C) 5×3 , D) 5×5 (1 mark)

5. True or False: 10 cubed equals 100. (1 mark)

6. If a cube has a side length of 2cm, what is its volume in cm^3 ? (1 mark)

7. Which number is equivalent to 6^3 ? A) 36, B) 18, C) 216*, D) 60 (1 mark)

8. True or False: 1 is a cube number because $1 \times 1 \times 1 = 1$. (1 mark)

9. If Max buys a special set of building blocks costing £1 for every block used in a $1 \times 1 \times 1$ cube, how much does he spend? (1 mark)

10. What is 7 cubed (7^3)? (1 mark)

Draw: Draw a 3D cube on isometric paper and label the length, width, and height as 3cm each. Show how many small 1cm cubes would fit inside the larger shape.



Extension challenge: 1. Explain why a square number and a cube number are different. 2. If a cube has a volume of 27cm^3 , what is the length of one side? 3. Compare and contrast the growth of square numbers (n^2) versus cube numbers (n^3). 4. Justify your answer: Is it possible for a cube number to end in the digit 2? Why or why not? 5. What might happen to the volume of a cube if you tripled the side length? 6. Investigate: Can you find a number that is both a square number and a cube number?