

Max's Magnificent Mathematical Cubes

Learning objective: To recognise and calculate cube numbers up to 10 cubed, and understand the relationship between a number and its cube.

Max the monkey is building a giant tower of blocks. He has discovered that some numbers are 'perfect cubes'. A cube number is the result of multiplying a whole number by itself twice (e.g., $3 \times 3 \times 3 = 27$). Use your knowledge of multiplication and the word bank to complete Max's challenge. For the final questions, explain your mathematical reasoning clearly.

Word bank: Base number · Product · Cube · Volume · Dimensions · Exponent

1. Max has a cube with a side length of 4cm. Calculate its volume. Show your calculation ($4 \times 4 \times 4$). (2 marks)

2. Identify the missing base number: If a cube has a volume of 125cm^3 , what is the length of one side? (2 marks)

3. True or False: The number 64 is a cube number. Justify your answer by showing the multiplication required to reach it. (2 marks)

4. Compare and contrast: How does a square number (e.g., 5×5) differ from a cube number (e.g., $5 \times 5 \times 5$) in terms of its geometric representation? (3 marks)

5. Explain why 100 is a square number but not a cube number. What is the next cube number after 64? (3 marks)

6. Max is building a structure that costs £2 for every 1cm^3 of wood. If he builds a cube with a side length of 3cm, how much will the materials cost in total? Show your working. (3 marks)

Draw: Draw a 3x3x3 cube structure. Label the length, width, and height with the measurement '3cm' and write the total volume inside the shape.



Extension challenge: Design a 'Cube Discovery' investigation. If you doubled the side length of a 2cm cube to 4cm, what happens to the total volume? Does it just double, or does it increase by more? Justify your answer using calculations and explain your findings to a partner.