Max’s Cube Number Construction Challenge

Learning objective: To identify, calculate, and apply knowledge of cube numbers up to 10^3.

Max the monkey is helping build a display for the school maths fair. He needs to stack blocks into perfect cubes. Use your knowledge of cube numbers to help Max complete his construction tasks. A cube number is a number multiplied by itself and then by itself again (e.g., $2^3 = 2 \times 2 \times 2 = 8$). Fill in the blanks to solve the puzzles.

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

1. Max has a base of 3 blocks by 3 blocks. If he builds it 3 blocks high, how many blocks does he need in total? Show your calculation. (2 marks)

2. If a cube is made of 64 identical small blocks, what is the length of one side of the cube? Explain how you found your answer. (2 marks)

3. Max wants to buy special display cases. A case for a 4^3 cube costs £15.00, and a case for a 5^3 cube costs £25.00. How much would it cost to buy two cases for 4^3 cubes and one case for a 5^3 cube? (2 marks)

4. True or False: 100 is a cube number. Give a reason for your answer. (2 marks)

5. Write out the sequence of cube numbers for 1^3, 2^3, 3^3, 4^3, and 5^3. (2 marks)

Draw: Draw a 3D representation of a 2^3 cube on squared paper, labelling the height, width, and depth as 2 units each.

Extension challenge: Max challenges you: Can you find the first cube number that is greater than 500? Show the multiplication calculation used to find it.