Max’s Mathematical Blocks: Investigating Cube Numbers

Learning objective: To recognise, recall and calculate cube numbers up to 10^3.

Max the monkey is organising his collection of wooden building blocks. He wants to build perfect cubes to store them. Read the information below and use your knowledge of multiplication to help Max solve his block puzzles.

A cube number is formed when you multiply a whole number by itself, and then by itself again. For example, 2 cubed (written as 2^3) is 2 × 2 × 2, which equals 8. If you have 8 blocks, you can build a cube that is 2 blocks wide, 2 blocks high, and 2 blocks deep. Max has been busy calculating: 1^3 is 1, 2^3 is 8, 3^3 is 27, 4^3 is 64, and 5^3 is 125. Remembering these patterns helps Max quickly calculate the space needed for his collection!

Word bank: cube number · multiplied · product · dimension · base · volume

1. Max has a stack of 4^3 blocks. How many blocks does he have in total? Show your working. (2 marks)

2. Calculate the value of 6^3. Show the multiplication steps you used to find the answer. (2 marks)

3. Which cube number is equal to 1,000? (1 mark)

4. Max wants to build a cube with a side length of 7. How many blocks will he need? (2 marks)

5. True or False: 27 is a cube number because 3 × 3 × 3 = 27. Explain your reasoning. (2 marks)

Draw: Draw a 3x3x3 cube made of small unit cubes. Label the height, width, and depth to show why this represents 3^3.

Extension challenge: Max has 200 blocks. What is the largest cube he can build using only some of those blocks, and how many blocks will he have left over?