Year 6 Maths Assessment: Exploring Cube Numbers

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

Read each question carefully. Max the monkey needs your help to solve these puzzles. Show all your working out to gain full marks.

Max the monkey is helping his friends build wooden storage boxes for their library. Each box is shaped like a perfect cube. To find the total number of blocks needed to build a larger cube, Max uses his knowledge of cube numbers. A cube number is a number multiplied by itself, and then multiplied by itself again.

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

1. Max has a small cube made of 2 blocks along each edge. Calculate the total number of blocks in this cube (2^3). Show your calculation. (2 marks)

2. Identify the next two cube numbers in the sequence after 3^3. (2 marks)

3. Is 64 a cube number? Explain your reasoning by showing the calculation used to reach your answer. (3 marks)

4. Max wants to build a larger cube structure with an edge length of 5. Calculate the volume of this structure (5^3). (2 marks)

5. A wooden crate costs £2 for every block used to build it. If a cube has an edge length of 3, what is the total cost of the crate? (4 marks)

6. Compare the value of 4^3 and 3■. Which is larger and by how much? Show your comparison clearly. (4 marks)

7. Max is designing a display for the library. He says, 'If I double the edge length of a cube, the total number of blocks inside increases by more than double.' Write an explanation to prove whether Max is correct or incorrect, using examples of cube numbers to support your argument. (5 marks)

Draw: Draw a representation of a 3x3x3 cube using small squares to show how the total number of 27 is reached.

Extension challenge: Total: /25