

Max's Mathematical Square Hunt: A Year 5 Assessment

Learning objective: To recognise and calculate square numbers, understand the relationship between area and squares, and apply knowledge to solve multi-step problems.

Read each question carefully. Max the monkey needs your help to solve these puzzles. Show your working out clearly, especially for the longer problems. Good luck!

Max is organising his collection of square-shaped tiles to create a mosaic in the jungle. He knows that a square number is the result of multiplying a whole number by itself (e.g., $3 \times 3 = 9$). He wants to ensure his patterns are mathematically perfect.

Word bank: Square number · Product · Area · Factor · Multiply · Indices · Calculation

1. List the first six square numbers starting from 1. (2 marks)

2. Max has a square board with a side length of 8cm. Calculate the area of the board. Explain how the area relates to square numbers. (3 marks)

3. True or False: 49 is a square number. Justify your answer using your knowledge of multiplication facts. (2 marks)

4. Max buys tiles that cost £4 each. He wants to cover a square area that is 5 tiles wide and 5 tiles long. How much will the tiles cost in total? Show your calculation. (3 marks)

5. Compare and contrast a square number with a prime number. Give one example of each to support your reasoning. (4 marks)

6. If a square has an area of 144cm^2 , what is the length of one of its sides? Show how you arrived at your answer. (3 marks)

7. Max is designing a larger pattern. He says, 'If I double the side length of a square, the area will also double.' Justify your answer. Is Max correct? Why or why not? (3 marks)

8. Extended Writing: Imagine you are an architect designing a courtyard. You must use exactly 100 square paving stones to create a large square pattern. Write a brief report explaining how you would arrange them. Describe the dimensions of your square and explain the mathematical reason why 100 is a 'square number'. (5 marks)

Draw: Draw a visual representation of the square number 16 using a grid of small dots or squares.



Extension challenge: Total: /25