

Max's Mathematical Squares Challenge

Learning objective: To identify, represent, and calculate square numbers up to 12 squared, and investigate the relationship between square numbers and area.

Max the monkey is obsessed with patterns! Use your knowledge of multiplication and arrays to help him solve these square number puzzles. Remember, a square number is the product of a number multiplied by itself.

Word bank: Square number · Product · Array · Dimensions · Area · Sequence · Squared

1. Max has 49 small square tiles. If he arranges them into a perfect square array, what are the dimensions of the square? Explain how you found your answer using multiplication facts. (2 marks)

2. Identify the next two square numbers in this sequence: 1, 4, 9, 16, 25, ____, ____. Justify your answer by showing the multiplication calculation for each. (2 marks)

3. Max buys a square frame for his favourite photo. The side length of the frame is 9cm. What is the area of the frame? Show your working out. (2 marks)

4. Compare and contrast the properties of the number 16 and the number 18. Why is 16 a square number but 18 is not? Use the term 'factor' in your explanation. (3 marks)

5. Max claims that the sum of two consecutive square numbers is always an odd number. Test this hypothesis using 2^2 and 3^2 , then 3^2 and 4^2 . Is Max correct? Explain your reasoning. (3 marks)

Draw: Draw a visual representation of 5 squared (5x5). Colour your array to show how it forms a perfect square shape and label the side lengths.



Extension challenge: What might happen if we tried to create a square number using a prime number as the side length? Explore this idea and write a brief justification for why the resulting area will always be a composite number.