

Max's Mathematical Squares

Learning objective: To identify, represent, and calculate square numbers up to 12×12 .

Help Max the monkey solve these square number puzzles. Remember, a square number is the result of multiplying a whole number by itself. For example, 3 squared (written as 3^2) is $3 \times 3 = 9$.

Max is busy arranging his collection of smooth river pebbles. He loves patterns! When Max places his pebbles into a perfect square shape, where the number of rows is the same as the number of columns, he creates a square number. If he has 2 rows of 2 pebbles, he has 4 pebbles in total. $2 \times 2 = 4$, so 4 is a square number. Max has discovered that square numbers grow very quickly. He is currently trying to work out the area of a square garden patch that measures 7 metres by 7 metres. Can you help him solve these challenges?

Word bank: Square number · Product · Multiply · Array · Squared · Integer

1. Max has a square array with 5 rows and 5 columns. How many pebbles does he have in total? Write this as a calculation. (2 marks)

2. Calculate the value of 8^2 (eight squared). (1 mark)

3. If a square has an area of 36cm^2 , what is the length of one of its sides? (2 marks)

4. List all the square numbers between 1 and 50. (3 marks)

5. Max buys a square photo frame that costs £12. If he buys 9 of these frames, how much does he spend in total? Use the square number 3^2 to help you explain your working. (3 marks)

Draw: Draw a 4x4 grid of dots to represent the square number 16. Label the sides to show that $4 \times 4 = 16$.



Extension challenge: Max challenges you to find the next three square numbers after 100. Write down the calculations for 11^2 , 12^2 , and 13^2 .