# Square Numbers Activity Booklet

twinkl

# Square Numbers

| | | |
|---|---|---|
| $1^2$ | $1 \times 1 =$ | **1** |
| $2^2$ | $2 \times 2 =$ | **4** |
| $3^2$ | $3 \times 3 =$ | **9** |
| $4^2$ | $4 \times 4 =$ | **16** |
| $5^2$ | $5 \times 5 =$ | **25** |
| $6^2$ | $6 \times 6 =$ | **36** |
| $7^2$ | $7 \times 7 =$ | **49** |
| $8^2$ | $8 \times 8 =$ | **64** |
| $9^2$ | $9 \times 9 =$ | **81** |
| $10^2$ | $10 \times 10 =$ | **100** |
| $11^2$ | $11 \times 11 =$ | **121** |
| $12^2$ | $12 \times 12 =$ | **144** |
| $13^2$ | $13 \times 13 =$ | **169** |
| $14^2$ | $14 \times 14 =$ | **196** |
| $15^2$ | $15 \times 15 =$ | **225** |

The product of a number multiplied by itself.

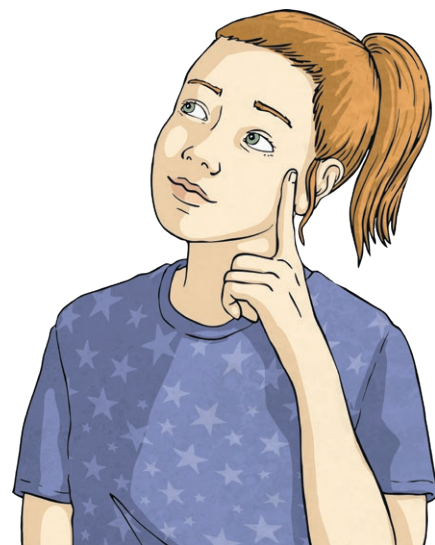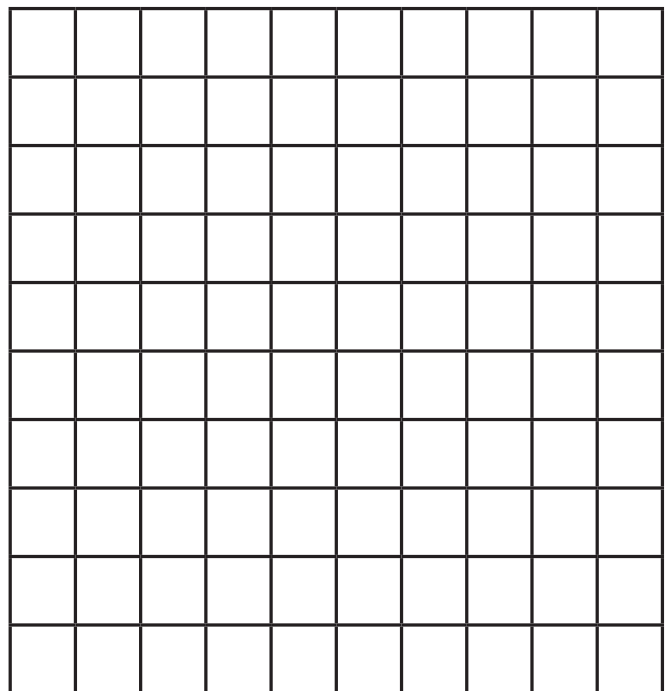**e.g. 10 × 10 = 100**

which can be shown as:

$10^2 = 100$

10 squared = 100

$10 \times 10 = 100$

# Investigating Square Numbers

Copy and complete.

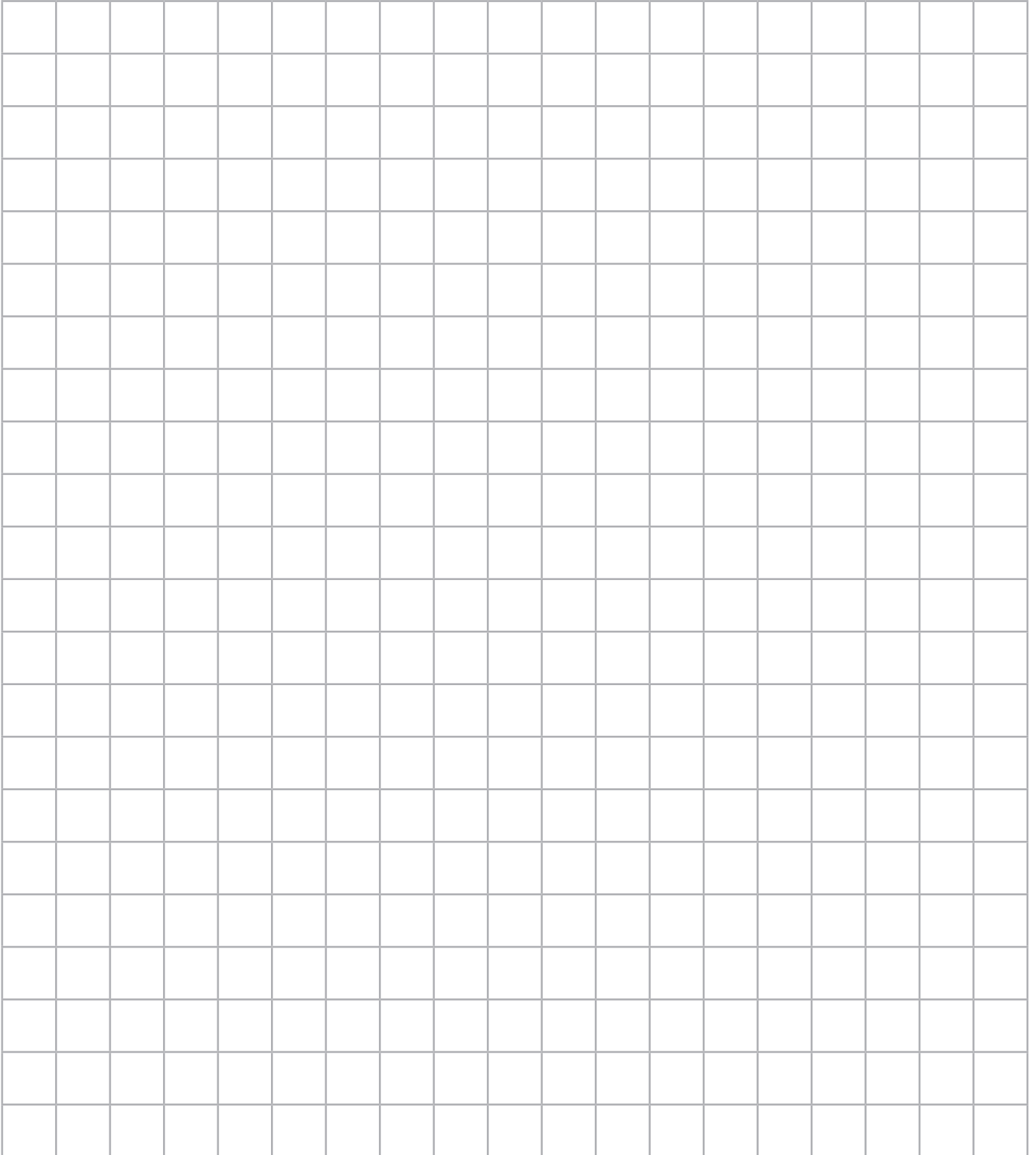Example:

$2^2$ = 2 × 2 = 4

$3^2$ = × =

$4^2$ = × =

$5^2$ = × =

# Investigating Square Numbers

$6^2$ =     ×     =

$7^2$ =     ×     =

# Investigating Square Numbers

Can you continue the sequence? 1, 4, 9, 16, 25, 36, 49...

# Diving into Mastery: Square Numbers

**1)** Complete the missing boxes in the table to identify the first ten square numbers. You might want to use counters to create each array on your table. The first one has been done for you.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 × 1 | 1² | 1 | • | | | | (6×6 array) |
| | 2² | | (2×2 array) | | 7² | | (7×7 array) |
| 3 × 3 | | | | 8 × 8 | | | (8×8 array) |
| | 16 | (4×4 array) | | | 9² | | |
| | 5² | | | | | | (10×10 array) |

**2)** Why are these numbers called square numbers?

_____

**3)** Look at the square numbers in the table. What patterns can you identify?

_____

_____

**1)** Jess says,

"$7^2$ is 14."

Do you agree?
Explain your thinking.

_____

_____

**2)** True or false? Justify your answers and use examples.

**a)** The square of even numbers is always even.

_____

**b)** All square numbers have an even number of factors.

_____

_____

**c)** The product of two square numbers is a square number.

_____

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**1)** The sum of two square numbers is 25. What are the square numbers?

_____

**2)** The sum of three square numbers less than 144 is another square number. What are the square numbers?

_____

**3)** A, B and C are different square numbers less than 144. Can you find eight solutions to make this statement true?

A + B > B − C

# Square Numbers

Circle the square numbers.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 49 | 66 | 17 | 36 | 9 | 144 |
| | | 101 | 81 | | 89 | |
| 75 | | | | 46 | 12 | |
| 100 | 25 | 4 | 123 | 121 | | 64 |

Match the square numbers.

| | |
|---|---|
| $2^2$ | 49 |
| $6^2$ | 25 |
| $3^2$ | 121 |
| $7^2$ | 144 |
| $11^2$ | 16 |
| $9^2$ | 64 |
| $12^2$ | 1 |
| $1^2$ | 81 |
| $4^2$ | 9 |
| $5^2$ | 36 |
| $8^2$ | 4 |

# Square Numbers

Write the number that is squared and the square number for each of these diagrams.

Number squared: _____
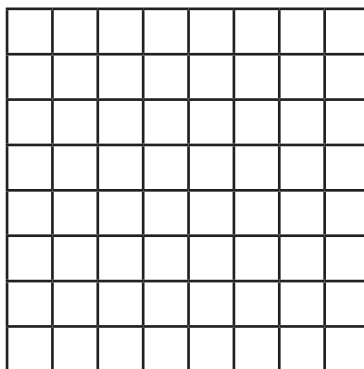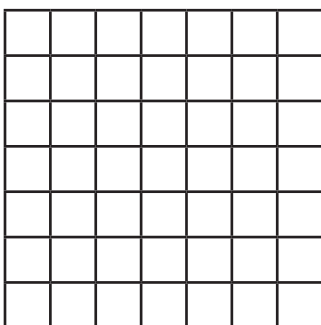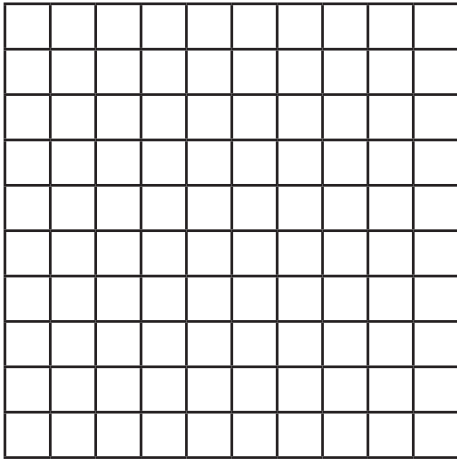
Square number: _____

Number squared: _____

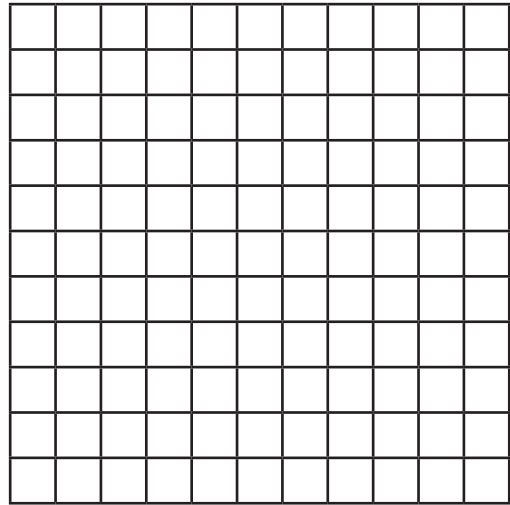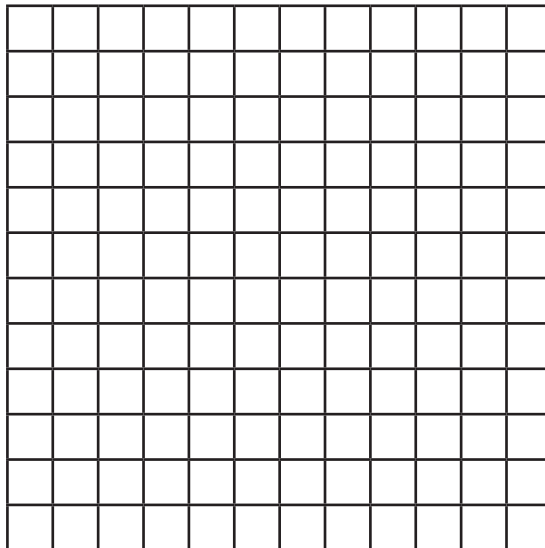Square number: _____

Number squared: _____
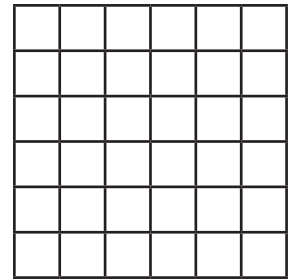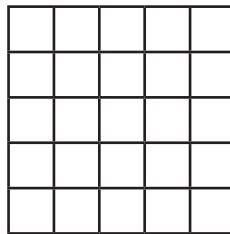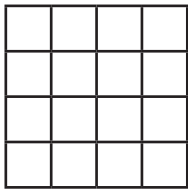
Square number: _____

Number squared: _____

Square number: _____

Number squared: _____

Square number: _____

Number squared: _____
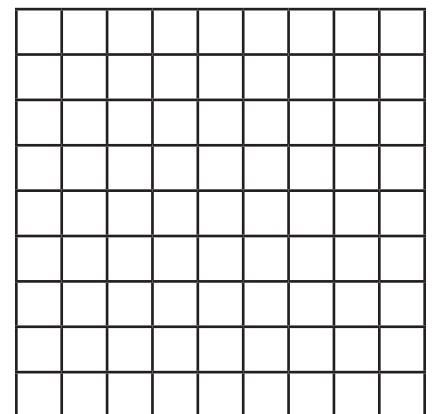
Square number: _____

Number squared: _____

Square number: _____

Number squared: _____

Square number: _____

Number squared: _____

Square number: _____

# Square Numbers

Number squared: _____

Square number: _____

Number squared: _____

Square number: _____

Number squared: _____

Square number: _____

# Square Numbers
# Answer Booklet

## Investigating Square Numbers

$3^2 = $ **3 × 3 = 9**

$4^2 = $ **4 × 4 = 16**

$5^2 = $ **5 × 5 = 25**

$6^2 = $ **6 × 6 = 36**

$7^2 = $ **7 × 7 = 49**

1, 4, 9, 16, 25, 36, 49...

**64, 81, 100, 121, 144**

# Diving into Mastery Square Numbers

**1)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 × 1 | $1^2$ | 1 | • | | 6 × 6 | $6^2$ | 36 | |
| **2 × 2** | $2^2$ | **4** | | | **7 × 7** | $7^2$ | **49** | |
| 3 × 3 | **$3^2$** | **9** | | | 8 × 8 | **$8^2$** | **64** | |
| **4 × 4** | **$4^2$** | 16 | | | **9 × 9** | $9^2$ | **81** | |
| **5 × 5** | $5^2$ | **25** | | | **10 × 10** | **$10^2$** | | |

**2)** A square number is the product of a number and itself. The product can be shown as a square array hence the name.

**3)** The square numbers alternate between odd and even.
The difference between consecutive square numbers is odd and follows the pattern 3, 5, 7, 9, 11 and so on.

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**1)** Jess is incorrect. $7^2$ is the same as 7 × 7 which is 49. Jess has calculated 7 × 2.

**2)**  a)  True. The product of two even numbers is always even.
For example, 4 × 4 = 16, 6 × 6 = 36.

   b)  False. Square numbers have an odd number of factors as they are the result of the number being multiplied by itself. For example, the factors of 16 are 1, 2, 4, 8 and 16.

   c)  True. For example, 1 × 4 = 4, 9 × 4 = 36.

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**1)** 9 + 16 = 25

**2)** 4 + 9 + 36 = 49 and 1 + 16 + 64 = 81

**3)** There are many possible solutions, such as:
1 + 16 > 16 – 9
1 + 16 > 16 – 4
1 + 25 > 25 – 16
1 + 25 > 25 – 9
1 + 25 > 25 – 4
16 + 4 > 4 – 1
25 + 81 > 81 – 64
36 + 49 > 49 – 16

# Square Numbers

Circle the square numbers.

(1)　(49)　66　17　(36)　(9)　(144)

　　　　　　101　(81)　89

75　(25)　　　46　　12

(100)　　(4)　　123　(121)　(64)

Match the square numbers.

| | |
|---|---|
| 2² | 49 |
| 6² | 25 |
| 3² | 121 |
| 7² | 144 |
| 11² | 16 |
| 9² | 64 |
| 12² | 1 |
| 1² | 81 |
| 4² | 9 |
| 5² | 36 |
| 8² | 4 |

# Square Numbers

Number squared: __1__

Square number: __1__
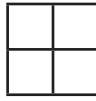
Number squared: __2__

Square number: __4__
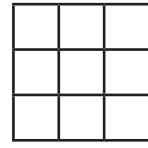
Number squared: __3__

Square number: __9__
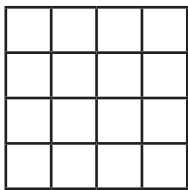
Number squared: __4__

Square number: __16__
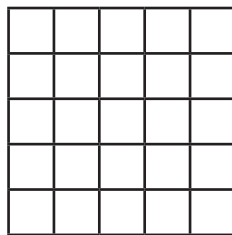
Number squared: __5__

Square number: __25__
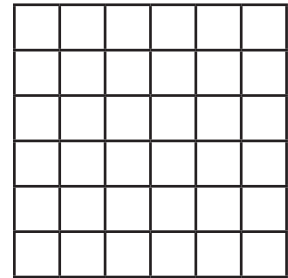
Number squared: __6__

Square number: __36__
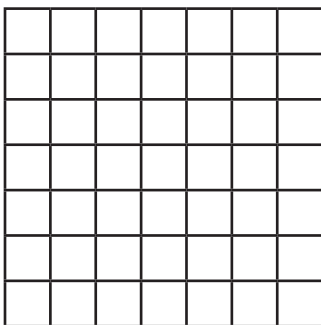
Number squared: __7__

Square number: __49__
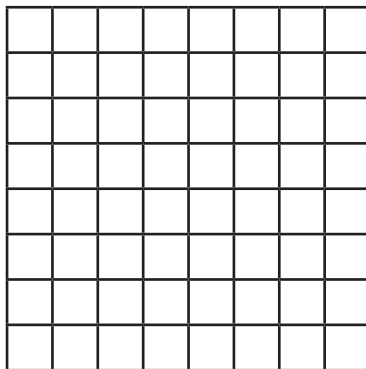
Number squared: __8__

Square number: __64__
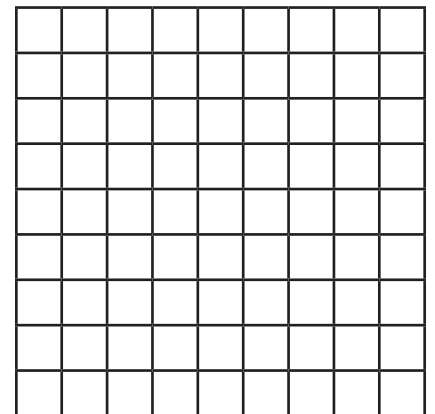
Number squared: __9__

Square number: __81__

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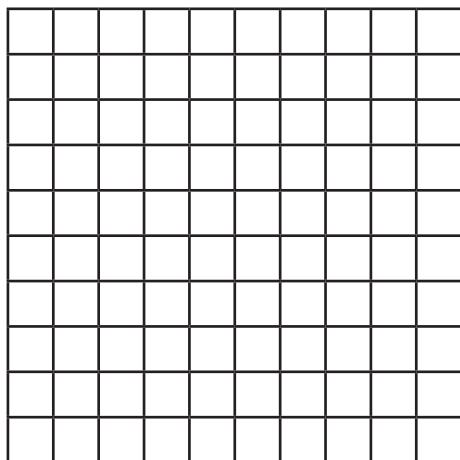
# Square Numbers

Number squared: __**10**__

Square number: __**100**__
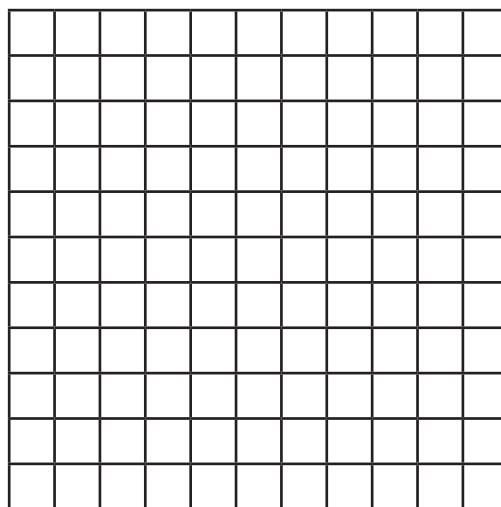
Number squared: __**11**__

Square number: __**121**__
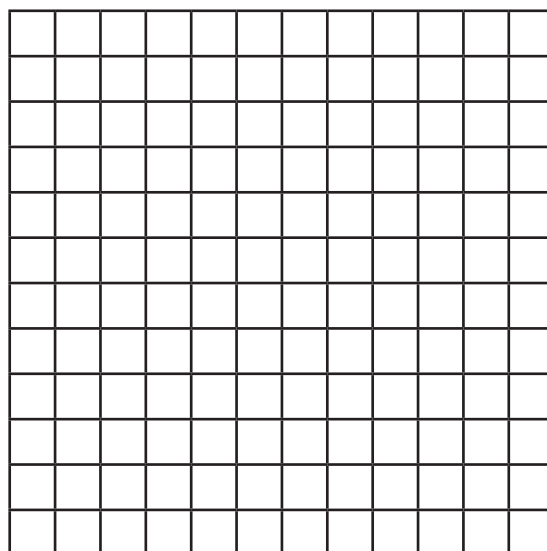
Number squared: __**12**__

Square number: __**144**__