Square Numbers Activity Booklet

Square Numbers

1^2	1 × 1 =	**1**
2^2	2 × 2 =	**4**
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**
8^2	8 × 8 =	**64**
9^2	9 × 9 =	**81**
10^2	10 × 10 =	**100**
11^2	11 × 11 =	**121**
12^2	12 × 12 =	**144**
13^2	13 × 13 =	**169**
14^2	14 × 14 =	**196**
15^2	15 × 15 =	**225**

The product of a number multiplied by itself.

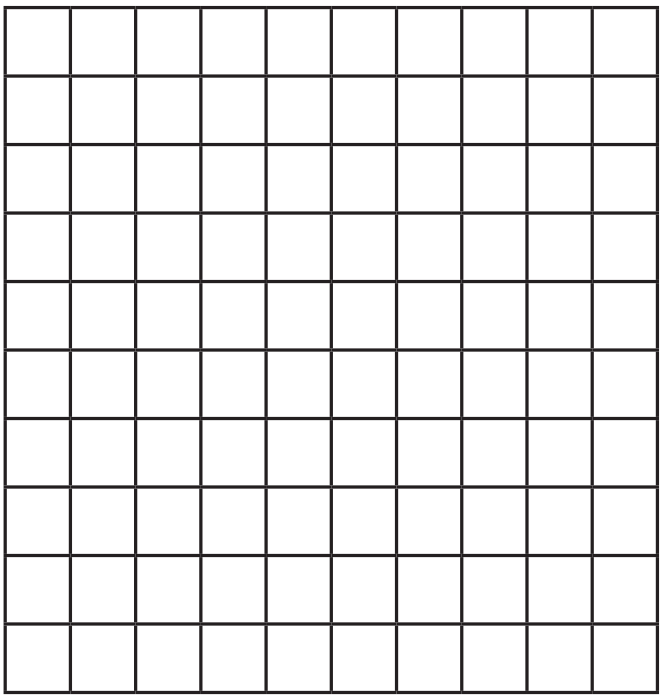
***e.g.* 10 × 10 = 100**

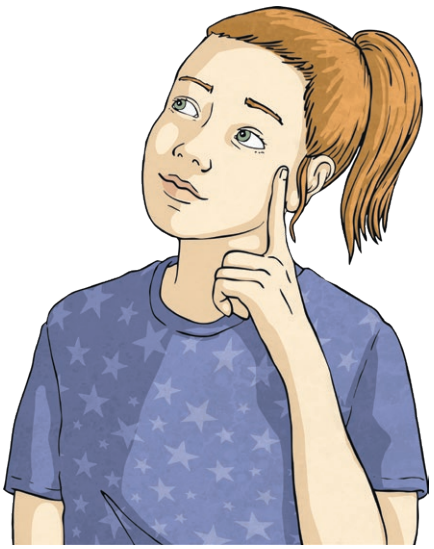
which can be shown as:

$10^2 = 100$

10 squared = 100

10 × 10 = 100





Investigating Square Numbers

Copy and complete.

Example:

$2^2 = 2 \times 2 = 4$

$3^2 = \quad \times \quad = \quad$

$4^2 = \quad \times \quad = \quad$

$5^2 = \quad \times \quad = \quad$

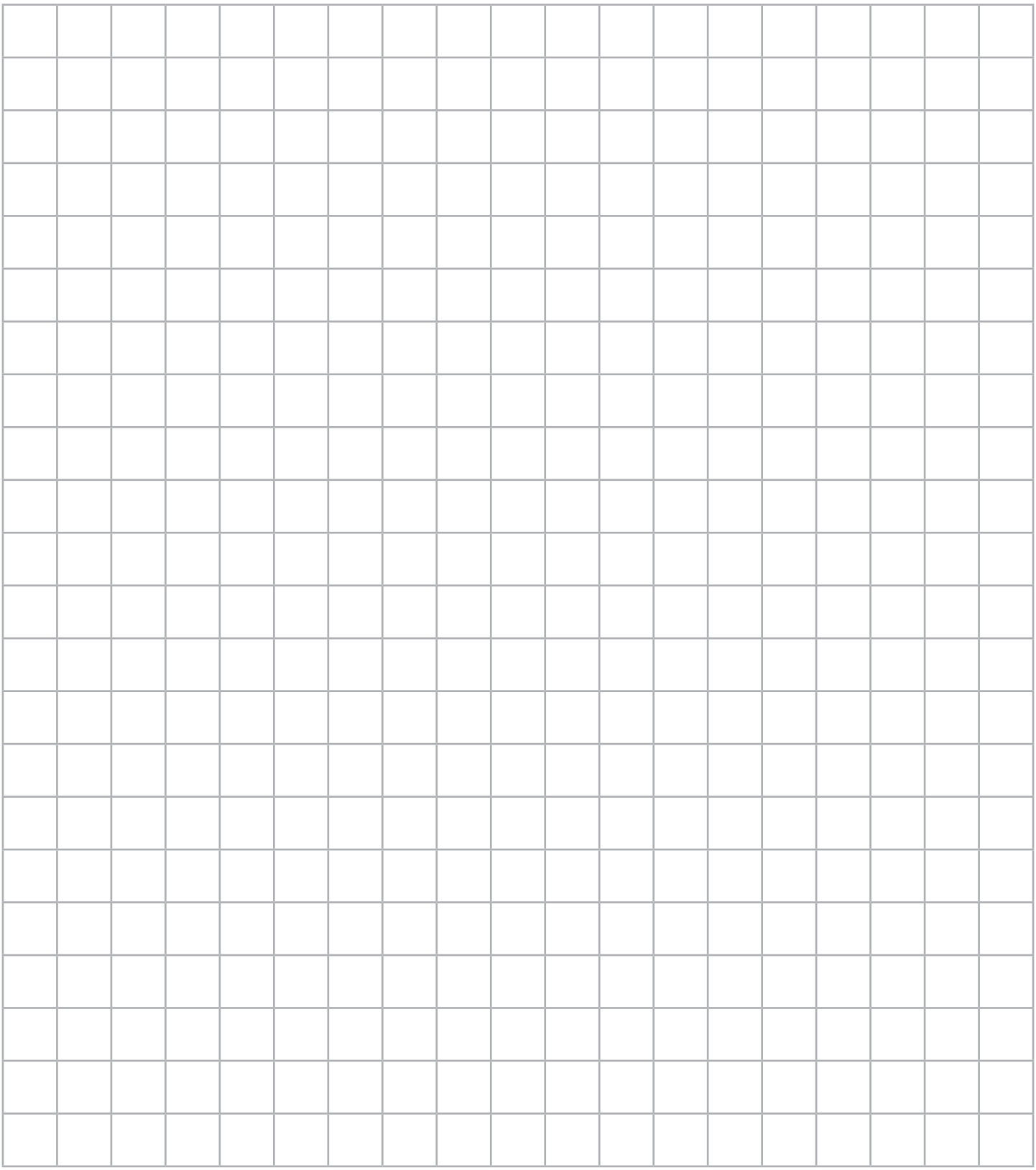
Investigating Square Numbers

6^2 = × =

7^2 = × =

Investigating Square Numbers

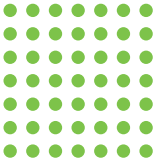
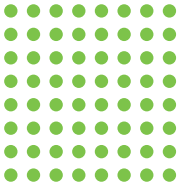
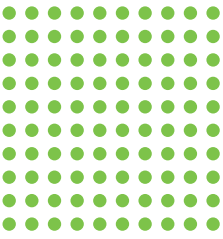
Can you continue the sequence? 1, 4, 9, 16, 25, 36, 49...



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	1^2	1	
	2^2		
3×3			
		16	
	5^2		

			
	7^2		
8×8			
	9^2		
			

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.

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
	75	101	81		89		
100		4		46	121	12	64
	25		123				

Match the square numbers.

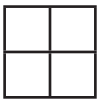
2^2	49
6^2	25
3^2	121
7^2	144
11^2	16
9^2	64
12^2	1
1^2	81
4^2	9
5^2	36
8^2	4

Square Numbers

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

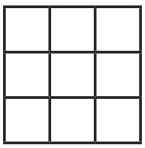
Number squared: _____

Square number: _____



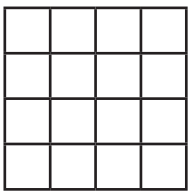
Number squared: _____

Square number: _____



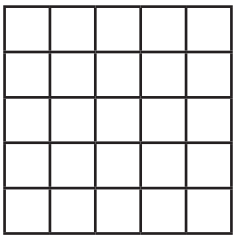
Number squared: _____

Square number: _____



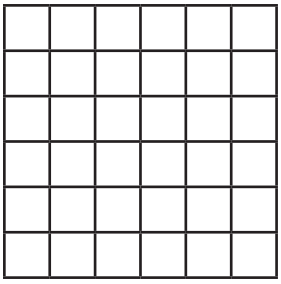
Number squared: _____

Square number: _____



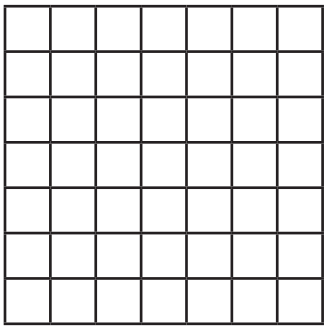
Number squared: _____

Square number: _____



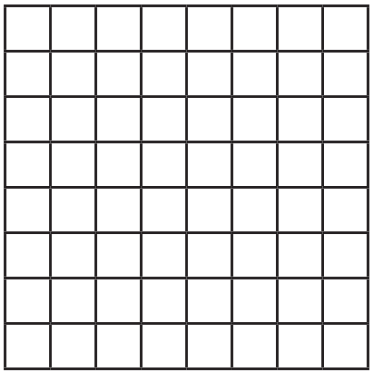
Number squared: _____

Square number: _____



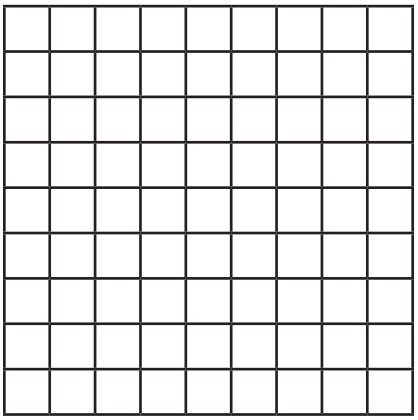
Number squared: _____

Square number: _____



Number squared: _____

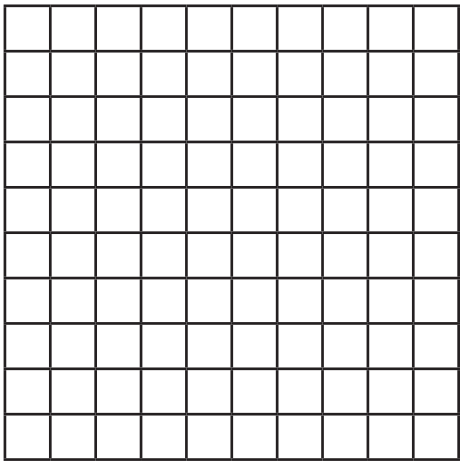
Square number: _____



Number squared: _____

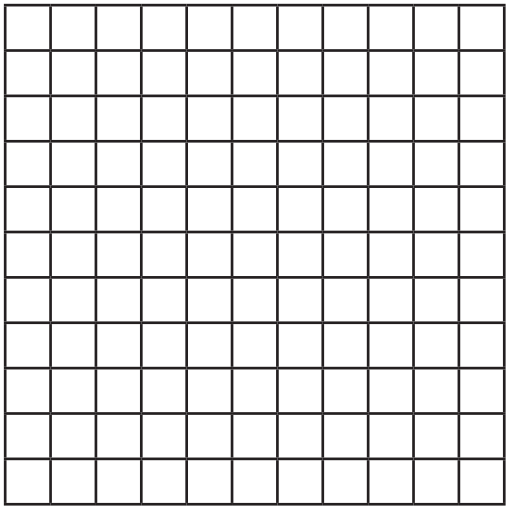
Square number: _____

Square Numbers



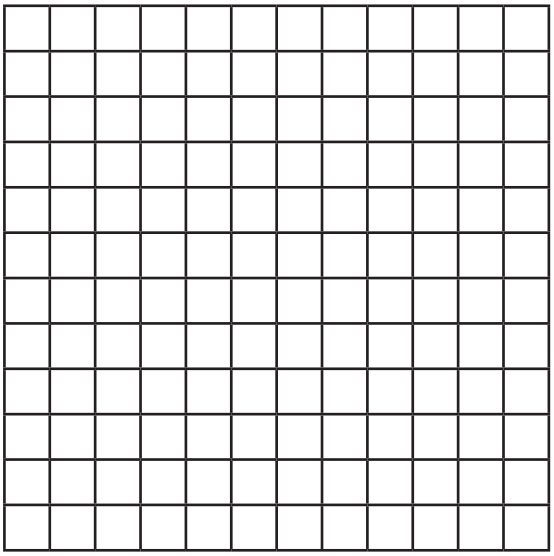
Number squared: _____

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**

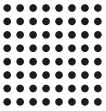
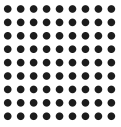
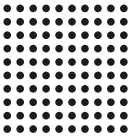
1, 4, 9, 16, 25, 36, 49...

64, 81, 100, 121, 144

Diving into Mastery Square Numbers

1)

1 × 1	1^2	1	
2 × 2	2^2	**4**	
3 × 3	**3^2**	**9**	
4 × 4	**4^2**	16	
5 × 5	5^2	**25**	

6 × 6	**6^2**	**36**	
7 × 7	7^2	**49**	
8 × 8	**8^2**	**64**	
9 × 9	9^2	**81**	
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.

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.

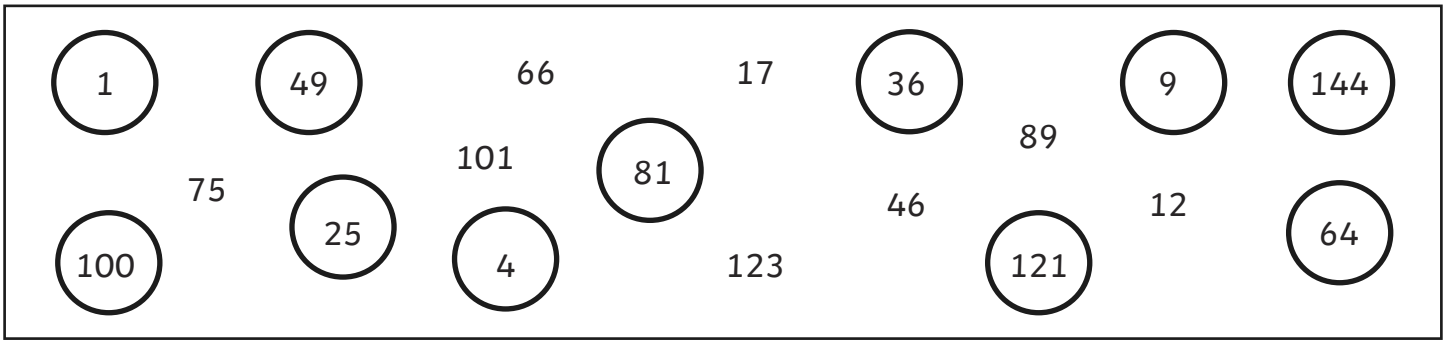
1) 9 + 16 = 25

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

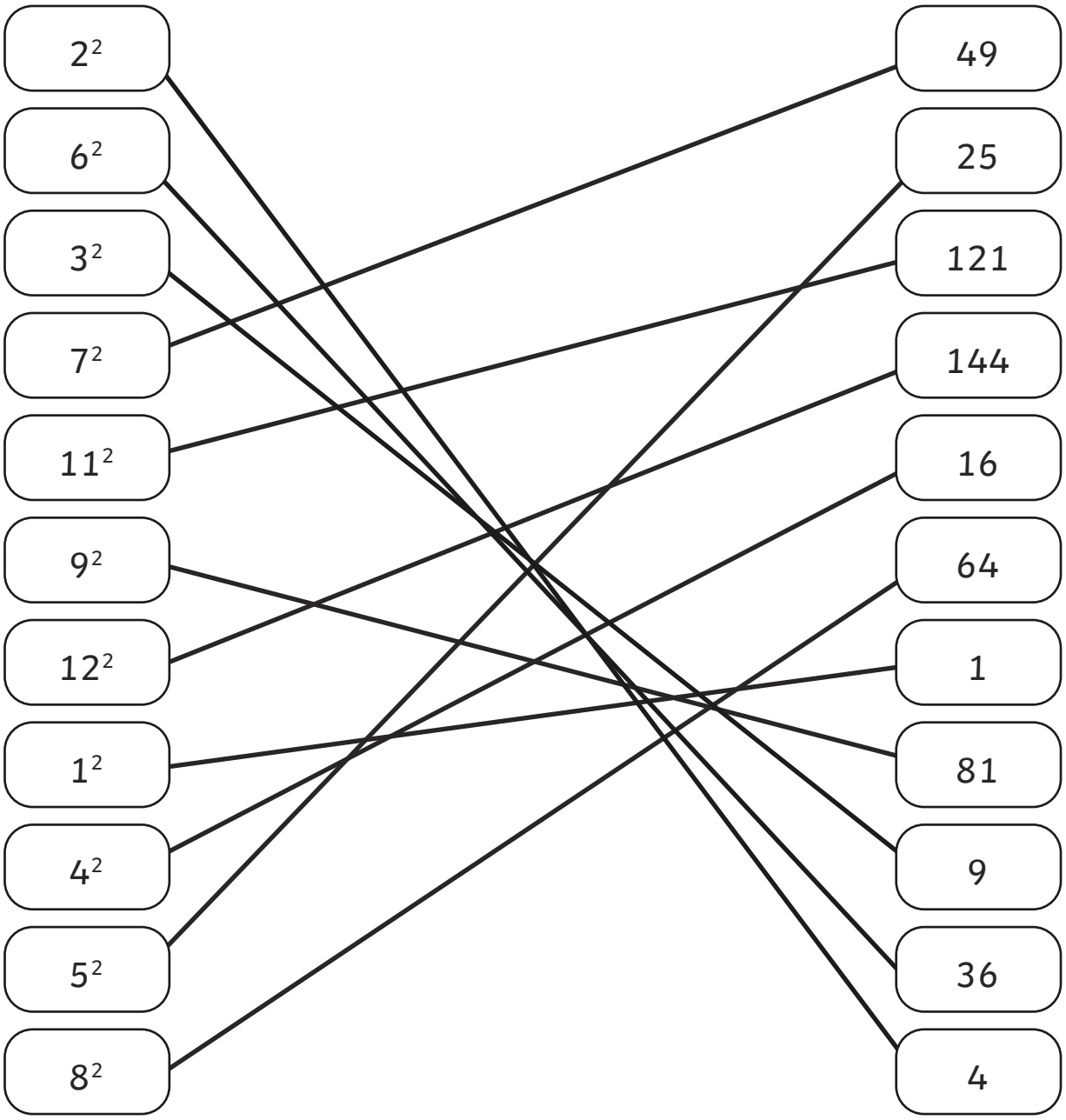
3) There are many possible solutions, such as:
1 + 16 > 16 – 9
1 + 16 > 16 – 4
1 + 25 > 25 – 16
1 + 25 > 25 – 9
1 + 25 > 25 – 4
16 + 4 > 4 – 1
25 + 81 > 81 – 64
36 + 49 > 49 – 16

Square Numbers

Circle the square numbers.



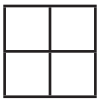
Match the square numbers.



Square Numbers

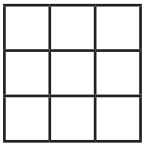
Number squared: 1

Square number: 1



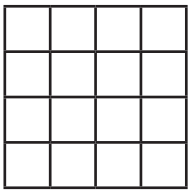
Number squared: 2

Square number: 4



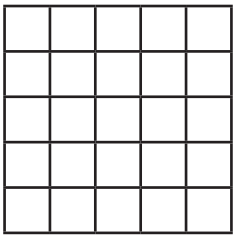
Number squared: 3

Square number: 9



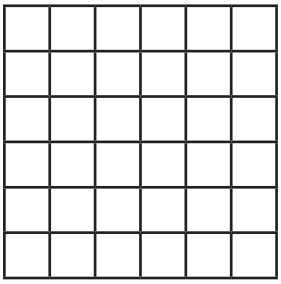
Number squared: 4

Square number: 16



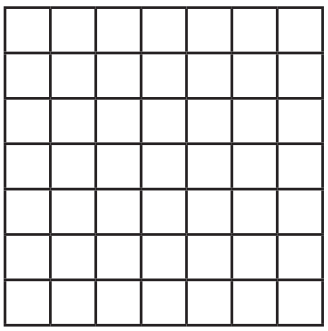
Number squared: 5

Square number: 25



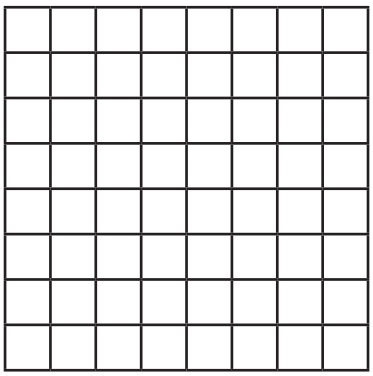
Number squared: 6

Square number: 36



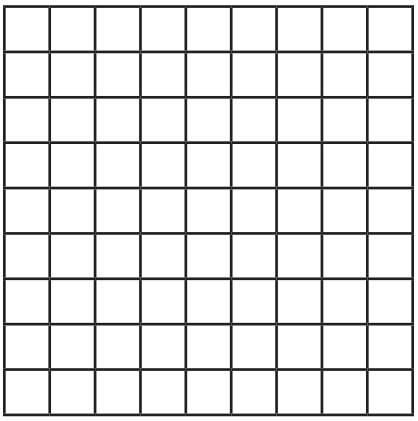
Number squared: 7

Square number: 49



Number squared: 8

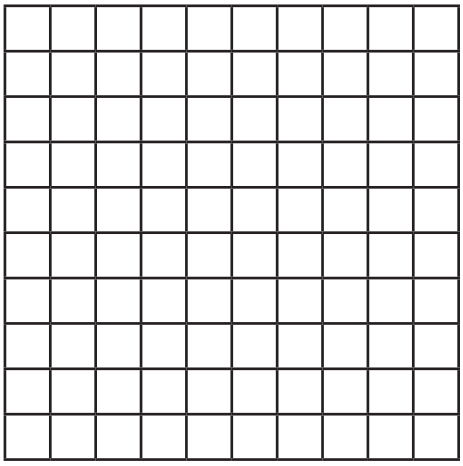
Square number: 64



Number squared: 9

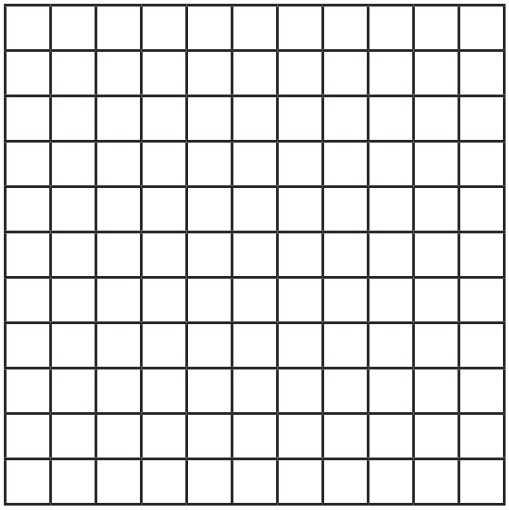
Square number: 81

Square Numbers



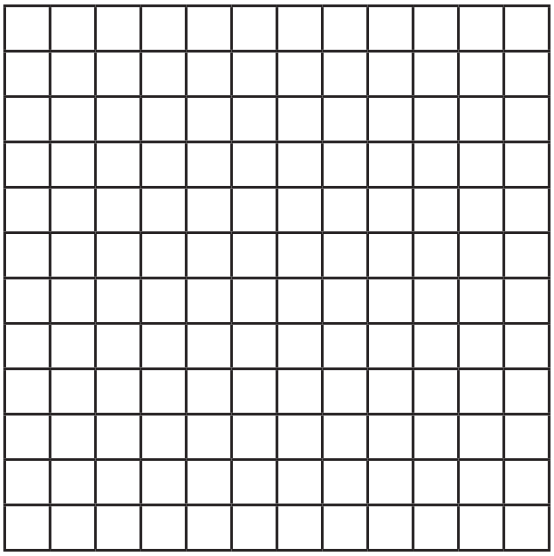
Number squared: 10

Square number: 100



Number squared: 11

Square number: 121



Number squared: 12

Square number: 144