

# SQUARE AND CUBE NUMBERS



GET READY



1) Write the first 5 prime numbers:

2)  $2 \times 2 \times 2 =$

3)  $9 \times 9 =$

4)  $5 \times 5 \times 5 =$

1) Write the first 5 prime numbers:

2, 3, 5, 7, 11

2)  $2 \times 2 \times 2 = 8$

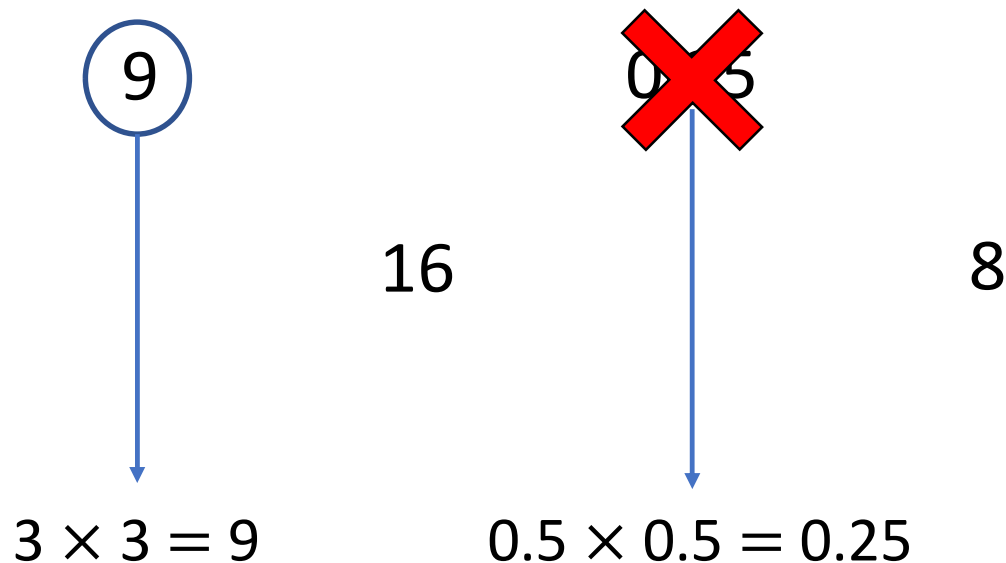
3)  $9 \times 9 = 81$

4)  $5 \times 5 \times 5 = 125$

LET'S LEARN



Which of these numbers are square numbers?  
How can you prove it?

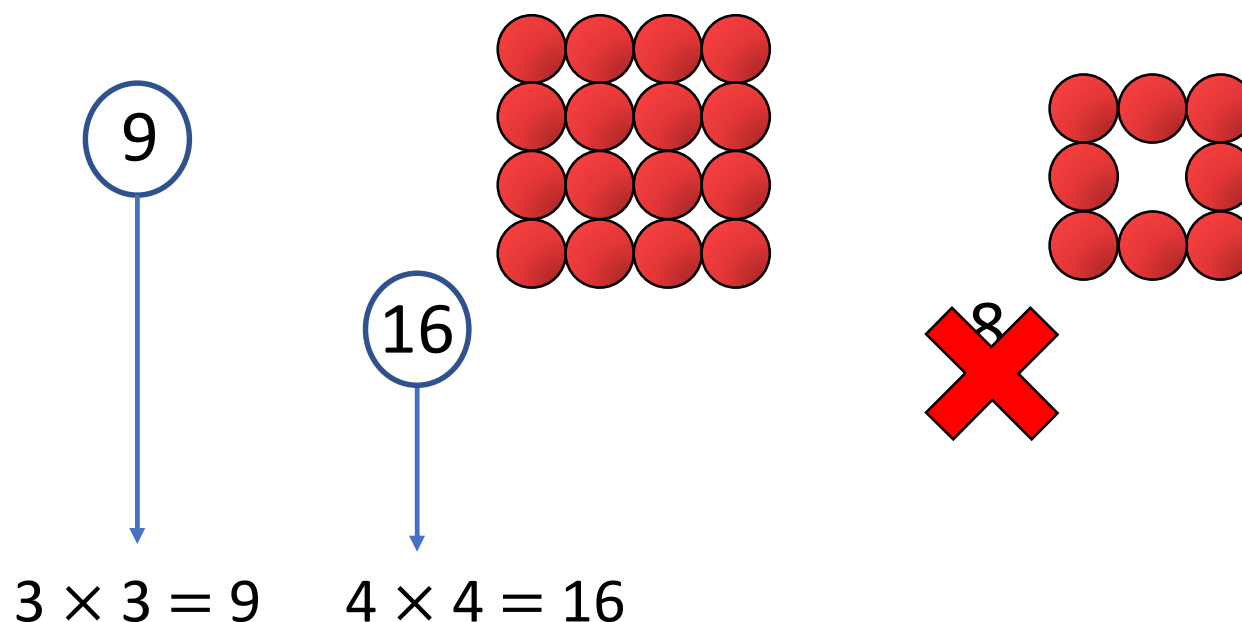


The result of a number multiplied by itself  
Has to be a whole number

Have a think



Which of these numbers are square numbers?  
How can you prove it?



The result of a number multiplied by itself  
Has to be a whole number  
Has to build a **complete** square

## Square numbers

The result of a number multiplied by itself

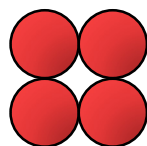
Has to be a whole number

Has to build a **complete** square

$$2^2$$

Two squared

$$2 \times 2$$





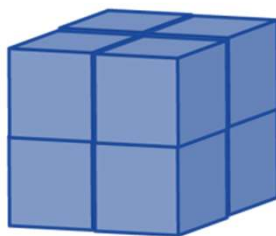
## Cube numbers

The result of a number multiplied by itself and then multiplied by itself again

$$2^3$$

Two cubed

$$2 \times 2 \times 2$$



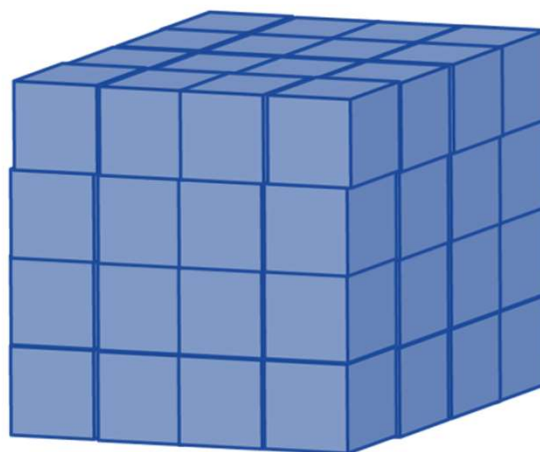
$$= 8$$

How many cubes do you need to build a  $4 \times 4 \times 4$  cube?

$$4^3$$

4 cubed

$$4 \times 4 \times 4$$



64 cubes

Have a think



**YOUR TURN**

Have a go at all of the  
questions on the  
worksheet



Dexter works out 20 squared

Annie works out 20 cubed

Find the difference between Dexter's and Annie's numbers.

Dexter:  $20 \times 20 = 400$

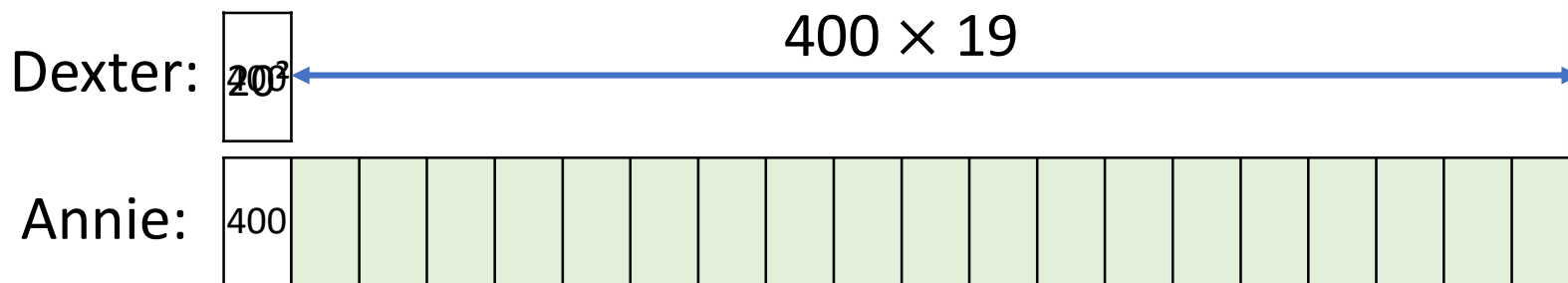
Annie:  $20 \times 20 \times 20 = 8,000$

$$8,000 - 400 = 7,600$$

Dexter works out 20 squared

Annie works out 20 cubed

Find the difference between Dexter's and Annie's numbers.



$$400 \times 19 = 7,600$$

Have a think



×

+

Th	H	T	O
	4	0	0
		1	9
<hr/>			
3	6	0	0
4	0	0	0
<hr/>			
7	6	0	0

What if Dexter was working out  $17^2$   
and Annie was working out  $17^3$ ?

What if Dexter was working out  $17^2$  and Annie was working out  $17^3$ ?

	Th	H	T	O
			1	7
×			1	7
<hr/>				
		1	1	9
+		1	7	0
<hr/>				
		2	8	9
<hr/>				

	Th	H	T	O
		2	8	9
×			1	7
<hr/>				
	2	0	2	3
+	2	8	9	0
<hr/>				
	4	9	1	3
<hr/>				

	Th	H	T	O
		<sup>8</sup> <del>9</del>	<sup>10</sup> <del>1</del>	<sup>13</sup>
4				
		2	8	9
<hr/>				
	4	6	2	4
<hr/>				

What if Dexter was working out  $17^2$   
and Annie was working out  $17^3$ ?

Dexter:  $289$   $\xleftarrow{289 \times 16}$

Annie: 

289																
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$$289 \times 16 = 4,624$$

	Th	H	T	O
		2	8	9
×			1	6
	1	7	3	4
+	2	8	9	0
	4	6	2	4

What if Dexter was working out  $17^2$   
and Annie was working out  $17^3$ ?

	Th	H	T	O
			1	7
×			1	7
		1	1	9
+		1	7	0
		2	8	9

	Th	H	T	O
		2	8	9
×			1	7
	2	0	2	3
+	2	8	9	0
	4	9	1	3

	Th	H	T	O
		<sup>8</sup> <del>8</del>	<sup>10</sup> <del>10</del>	
	4			13
−		2	8	9
	4	6	2	4

	Th	H	T	O
			1	7
×			1	7
		1	1	9
+		1	7	0
		2	8	9

	Th	H	T	O
		2	8	9
×			1	6
	1	7	3	4
+	2	8	9	0
	4	6	2	4

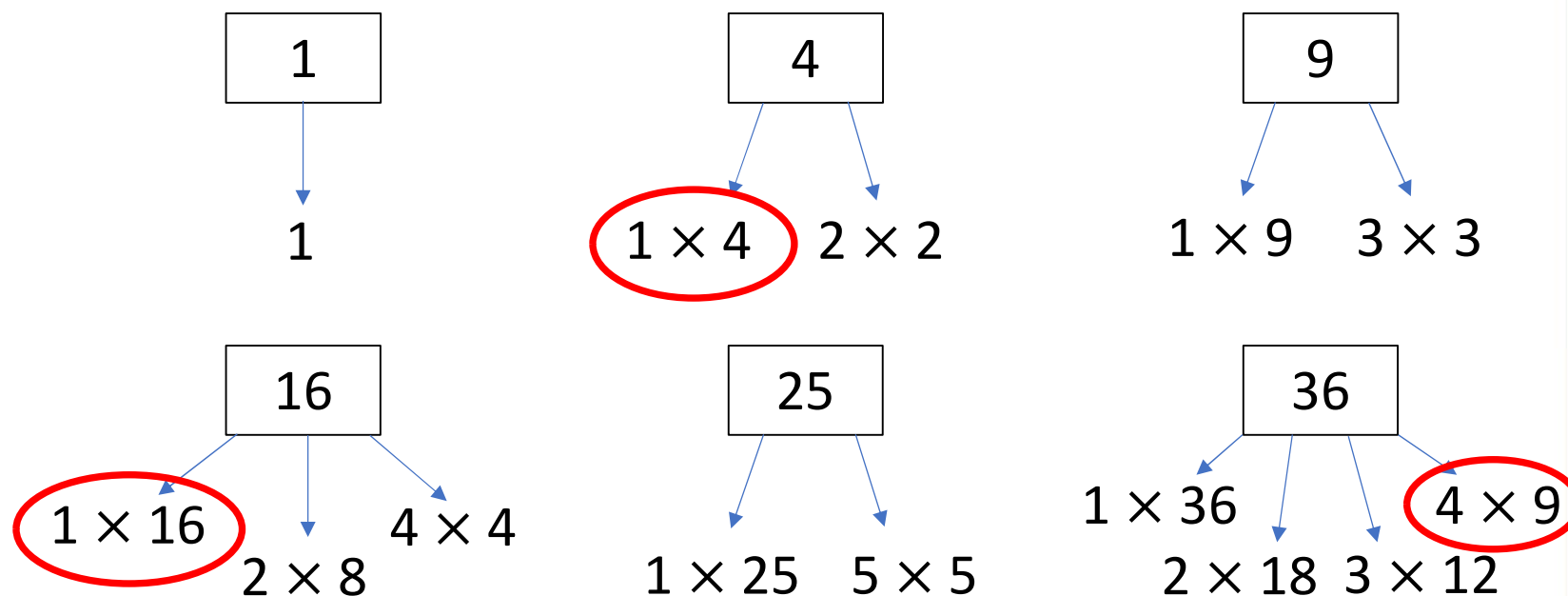
What's the same?  
What's different?

Have a think





When Mo adds two numbers he gets a prime number.  
When he multiplies them he gets a square number.



2, 3, 5, 7, 11, 13, 17, 19, 23,