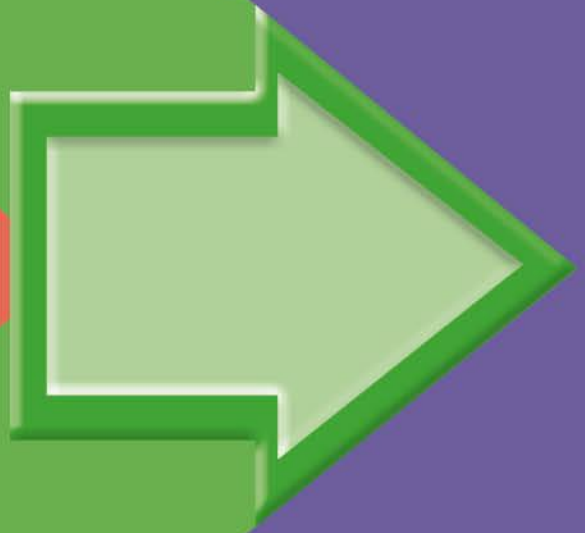
SQUARE AND CUBE NUMBERS



White Rose Maths

GET READY

White Rose Maths

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

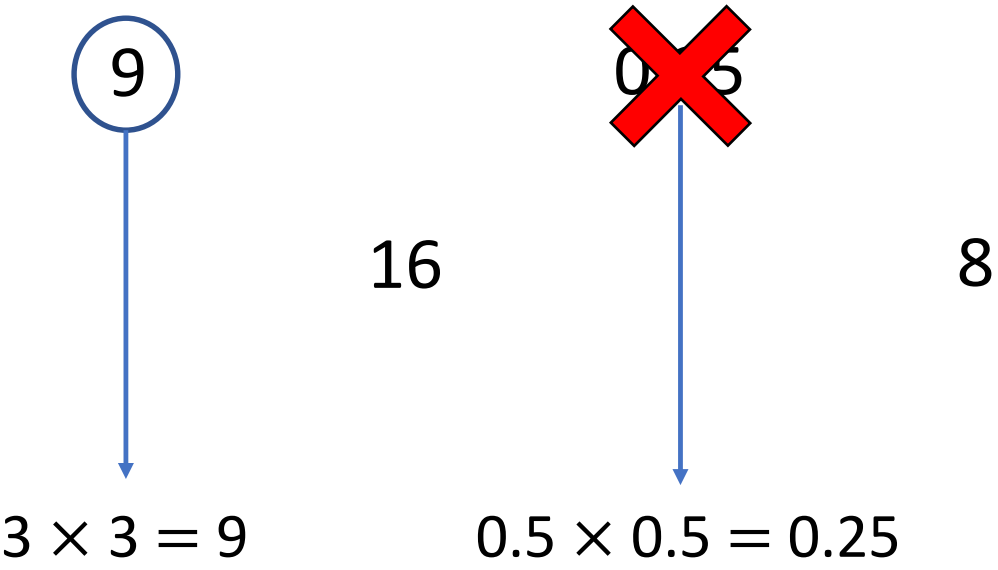
3) $9 \times 9 =$ 81

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

LET'S LEARN

White Rose Maths

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



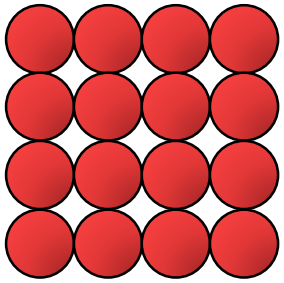
The result of a number multiplied by itself

Has to be a whole number

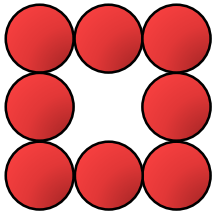
Have a think

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

9



16



8

$3 \times 3 = 9$

$4 \times 4 = 16$

The result of a number multiplied by itself

Has to be a whole number

Has to build a complete square

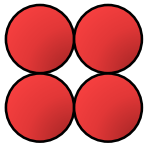
Square numbers

The result of a number multiplied by itself

Has to be a whole number

Has to build a **complete** square

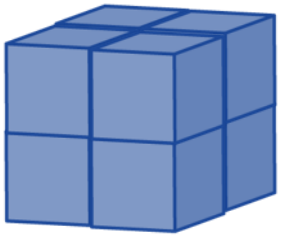
2^2 Two squared 2×2



Cube numbers

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

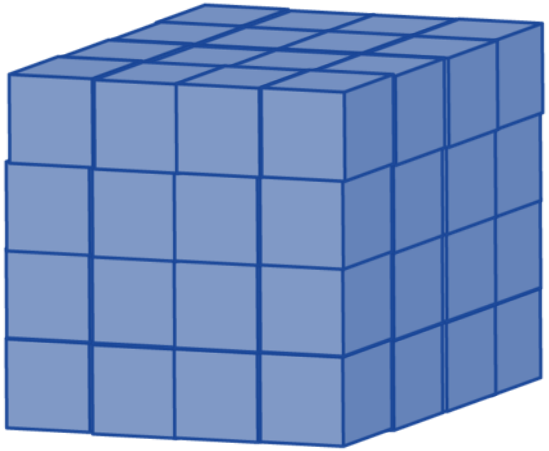
2^3 Two cubed $2 \times 2 \times 2$



$= 8$

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

White Rose Maths

Dexter works out 20 squared

Annie works out 20 cubed

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

Dexter: $20 \times 20 = 400$

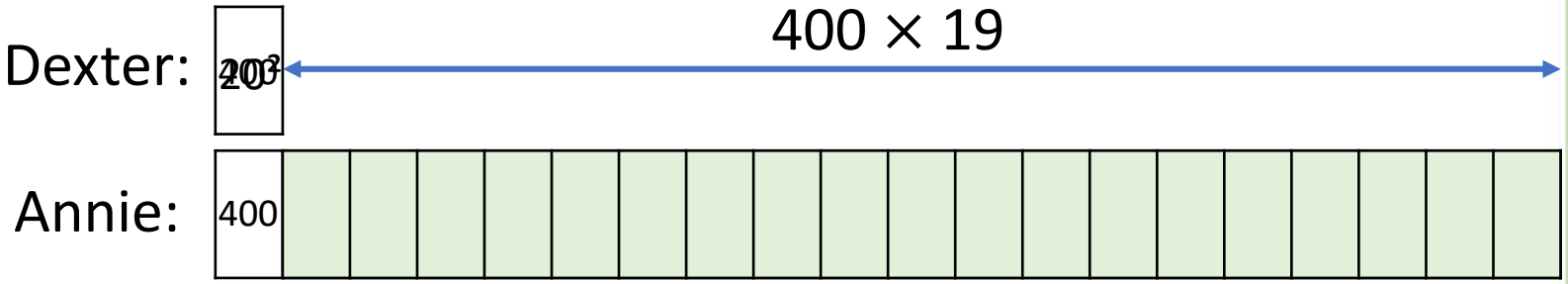
Annie: $20 \times 20 \times 20 = 8{,}000$

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

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

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

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

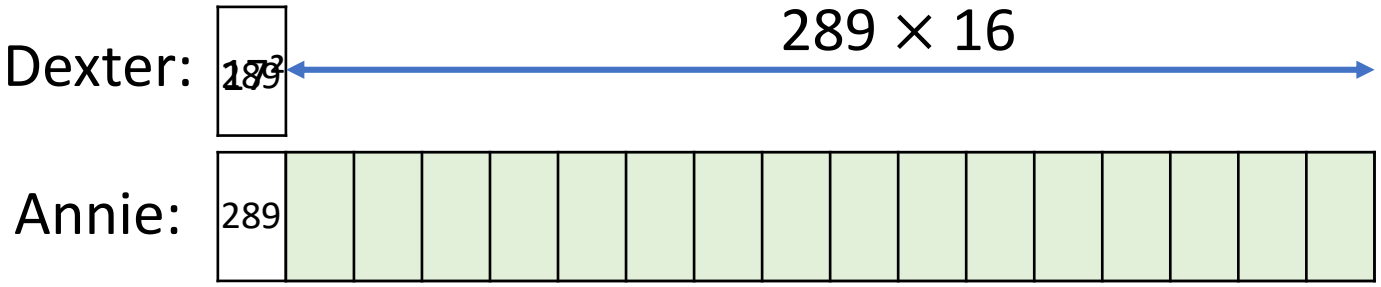
What if Dexter was working out 17^2 and Annie was working out 17^3?

	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
	4	~~9~~ 8	~~1~~ 10	$^{1}3$
−		2	8	9
	4	6	2	4

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



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

	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
	4	~~9~~ 8	~~1~~ 10	$^{1}3$
−		2	8	9
	4	6	2	4

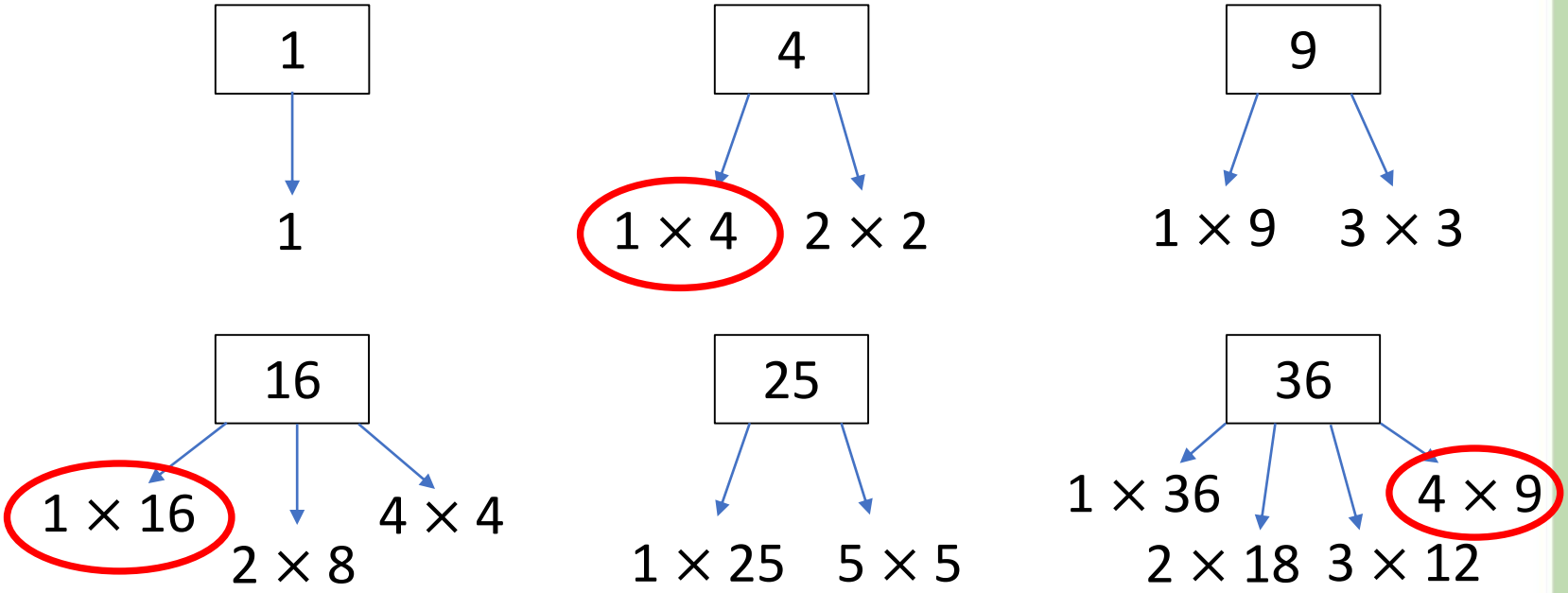
	Th	H	T	O
			1	7
×			1	7
		1	1	9
+		1	7	0
		2	8	9

	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,