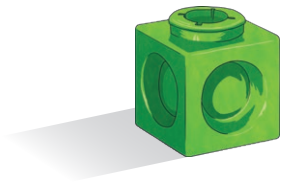
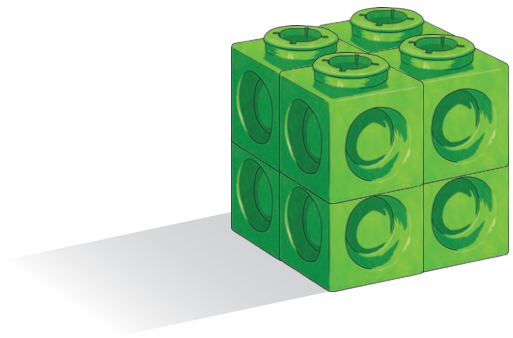
Cube Numbers



1

$1 \times 1 \times 1 = 1$

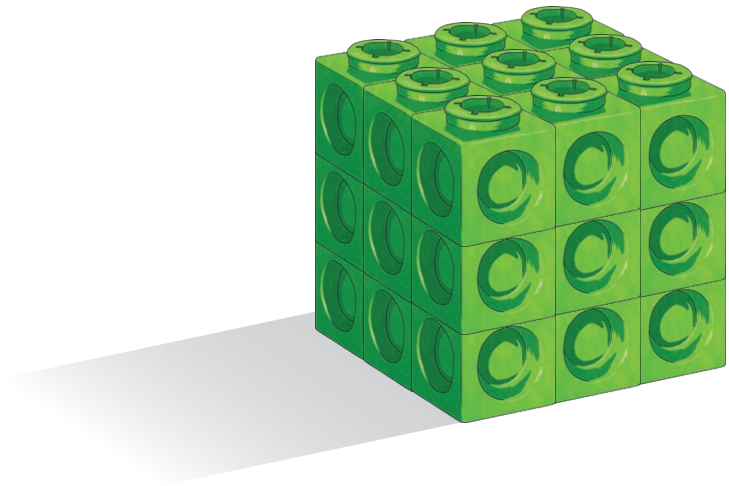
Cube Numbers



8

$2 \times 2 \times 2 = 8$

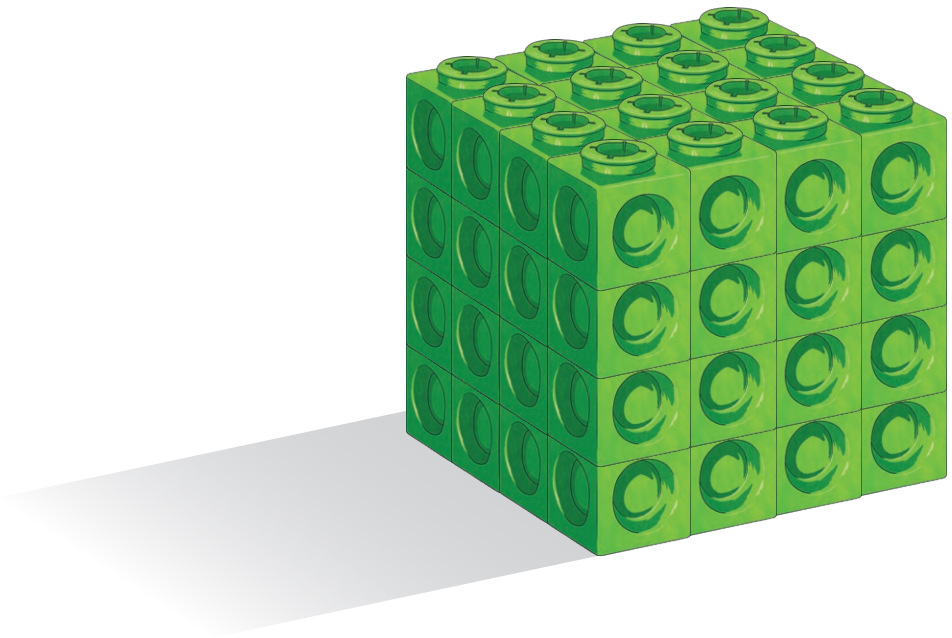
Cube Numbers



27

$3 \times 3 \times 3 = 27$

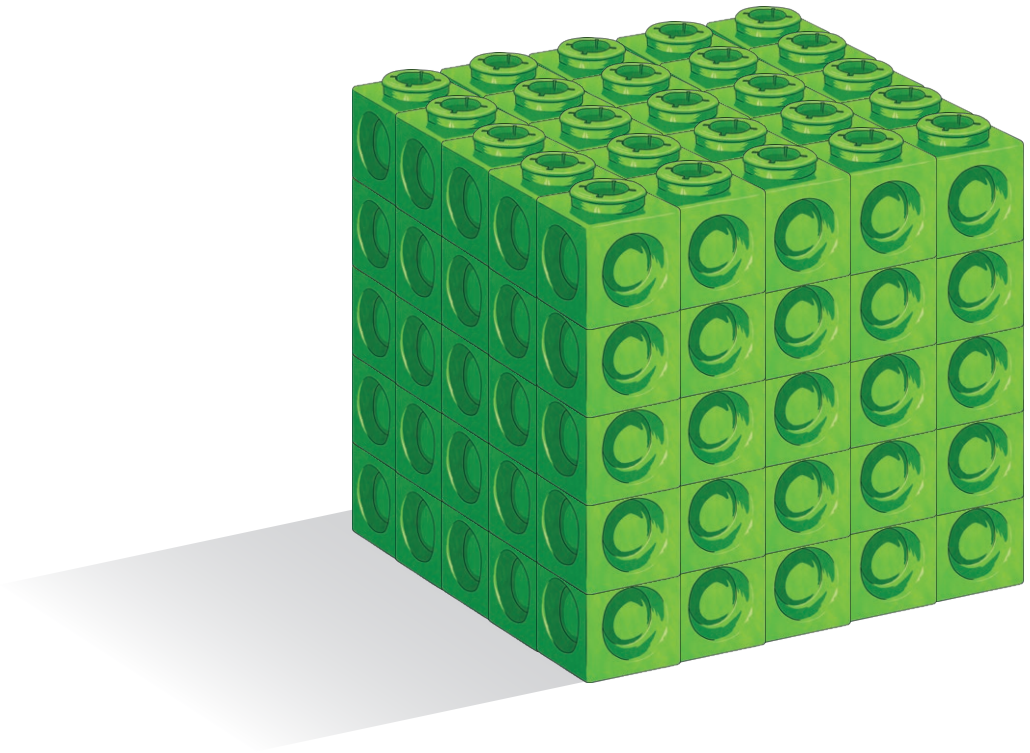
Cube Numbers



64

$4 \times 4 \times 4 = 64$

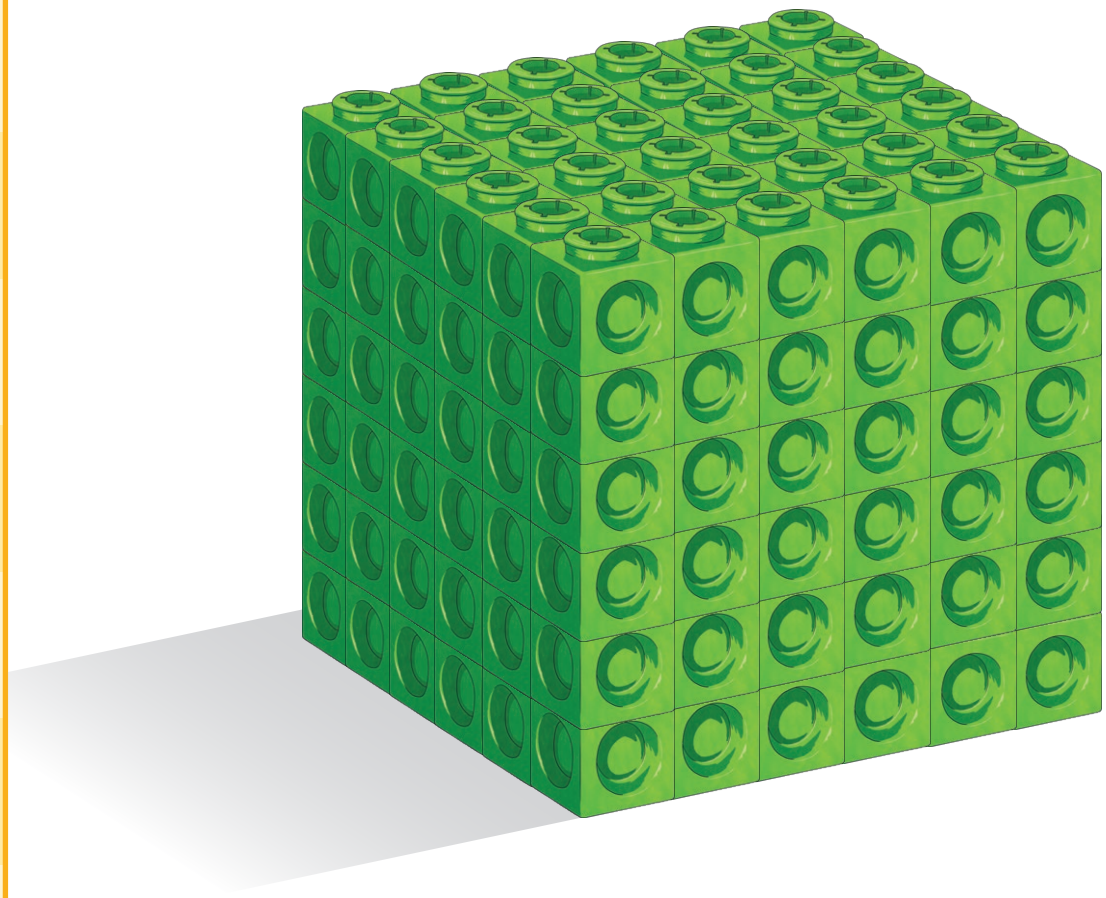
Cube Numbers



125

$5 \times 5 \times 5 = 125$

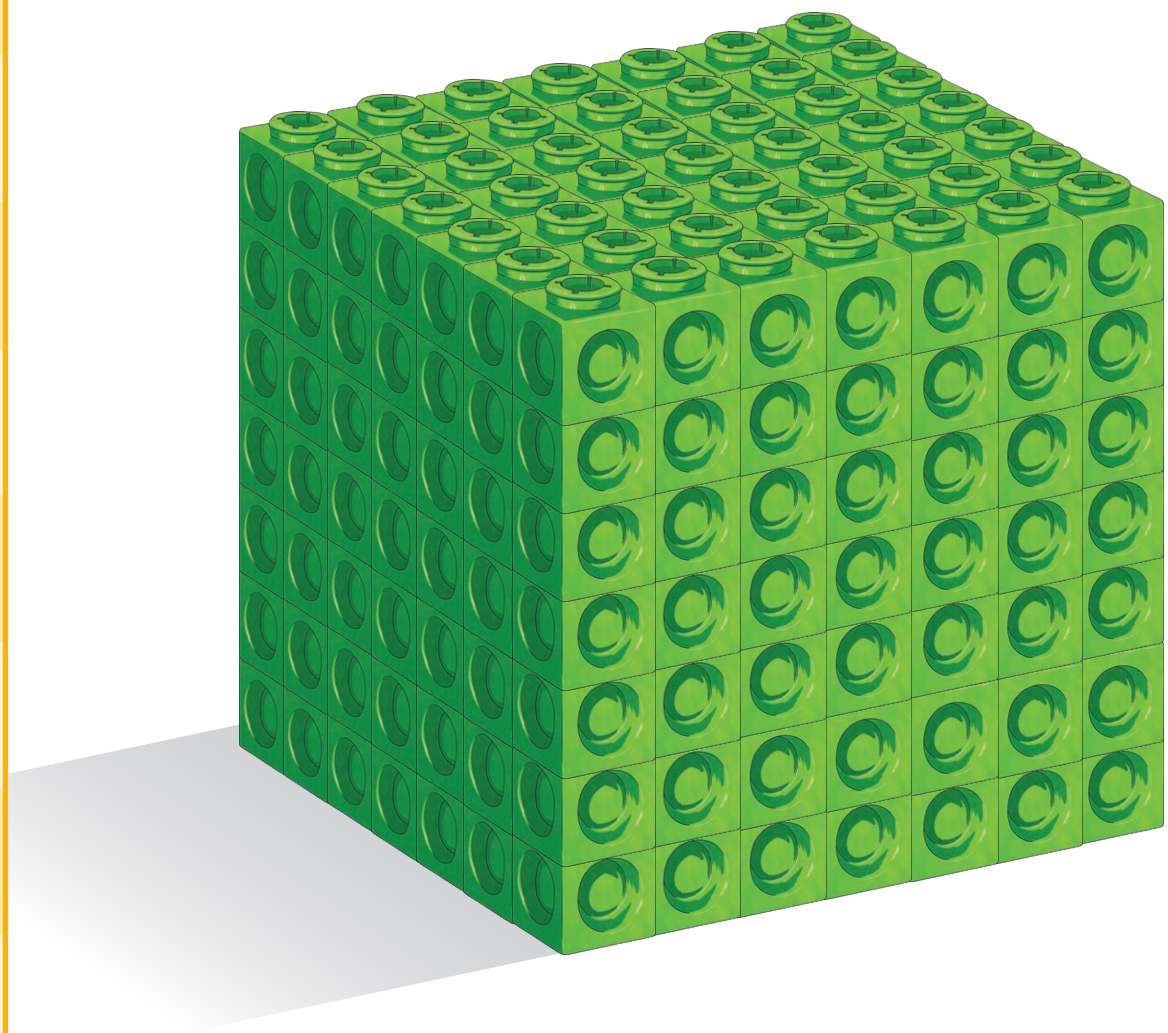
Cube Numbers



216

$6 \times 6 \times 6 = 216$

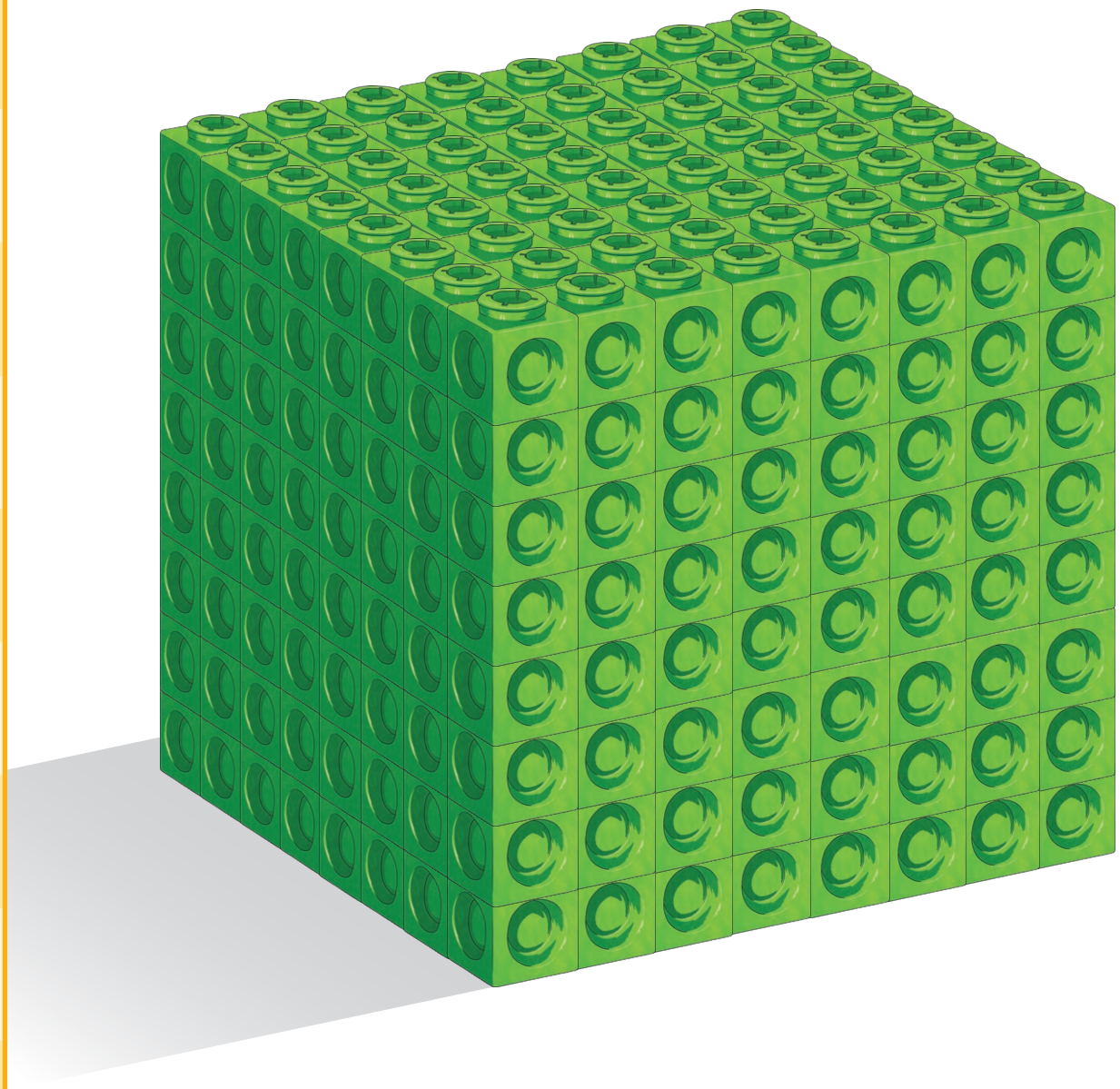
Cube Numbers



343

$7 \times 7 \times 7 = 343$

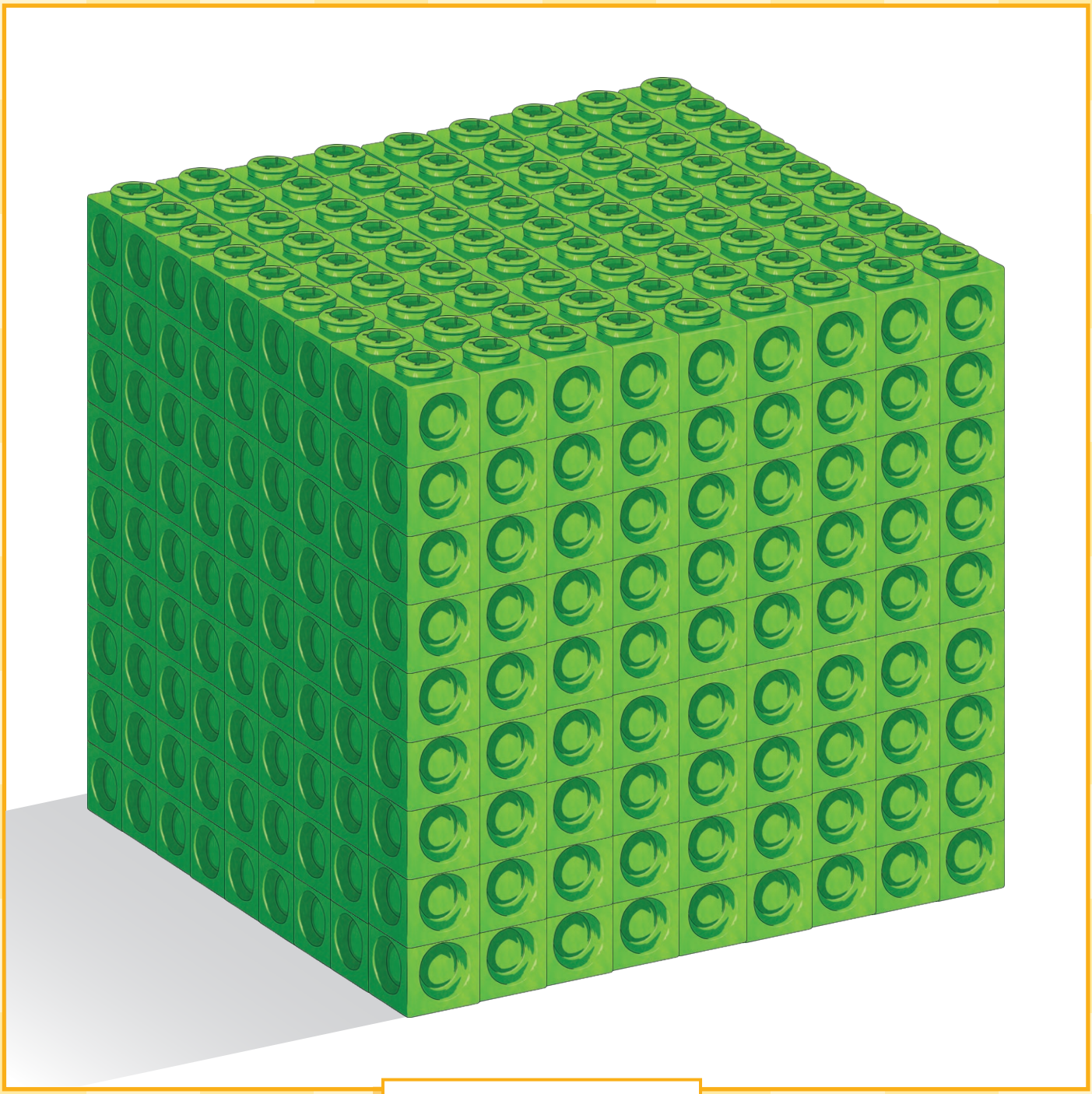
Cube Numbers



512

$8 \times 8 \times 8 = 512$

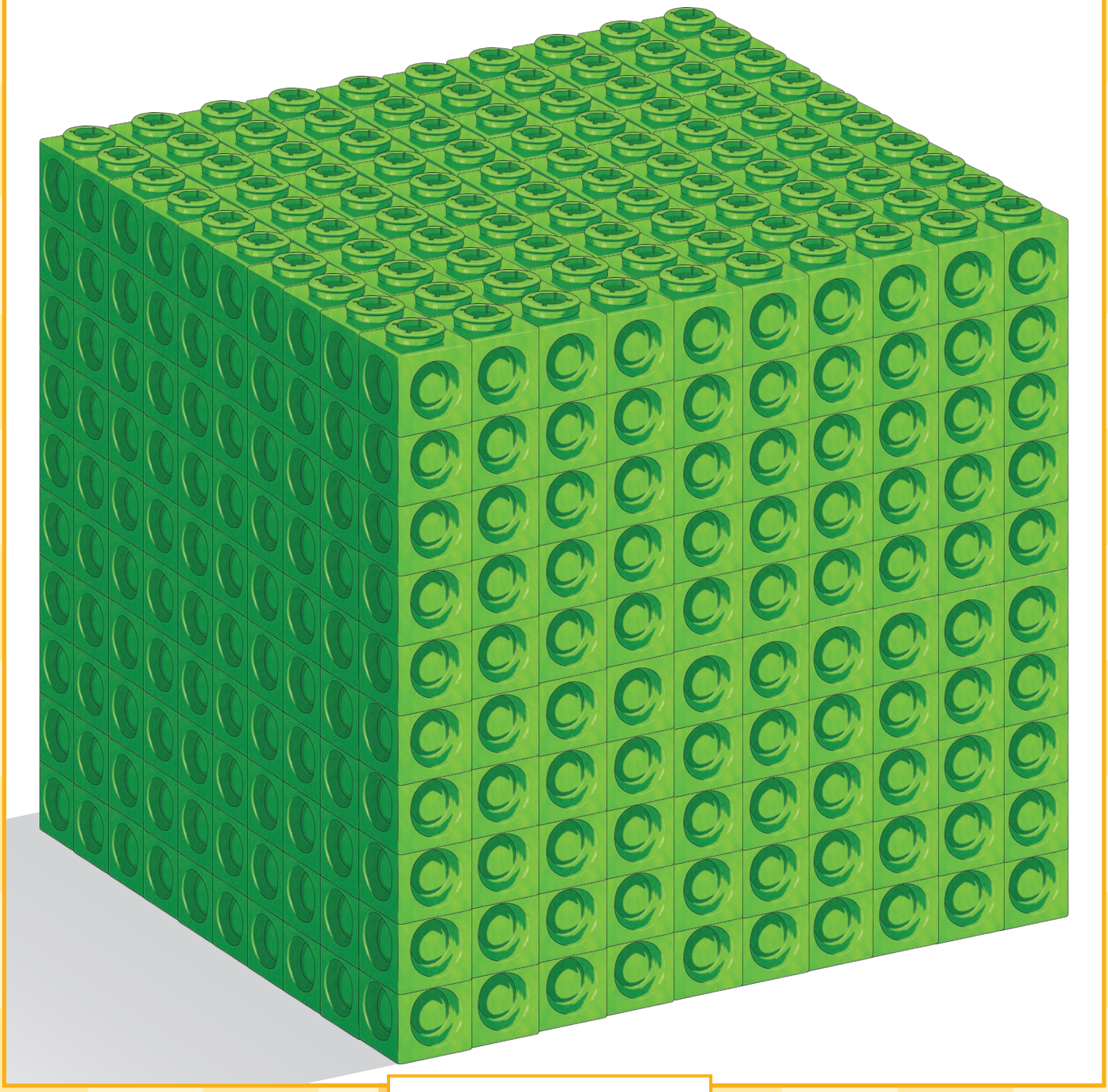
Cube Numbers



729

$9 \times 9 \times 9 = 729$

Cube Numbers



1000

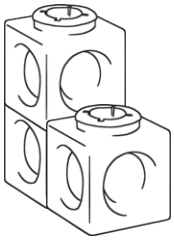
$10 \times 10 \times 10 = 1000$

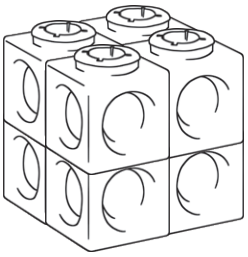
Cube Numbers

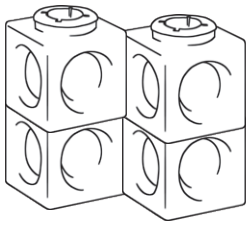
To find cube numbers.

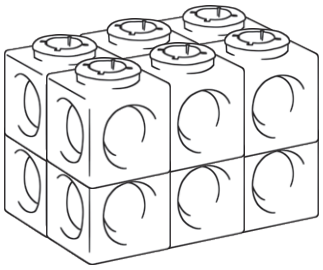
Adult Guided Task

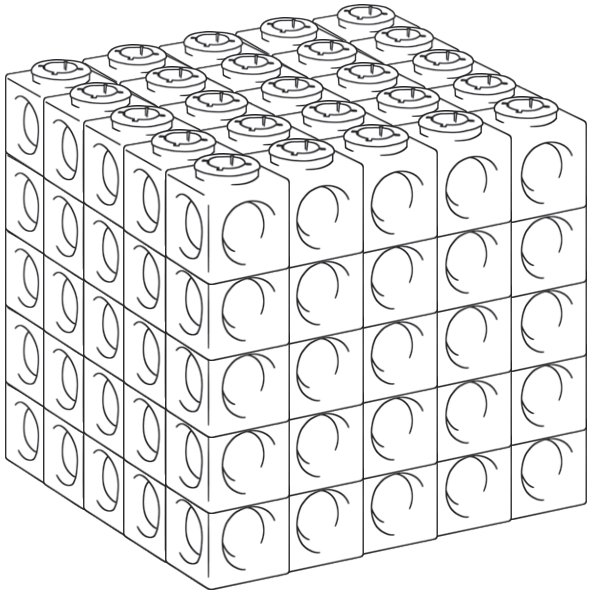
Use the activity cards and question prompts to have a discussion about cube numbers. Consider whether each image is showing a cube number or not and sort them into two piles. You could use sorting hoops to help you sort.

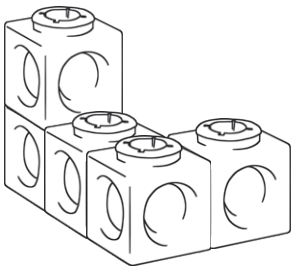


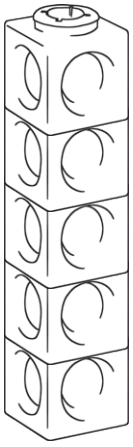


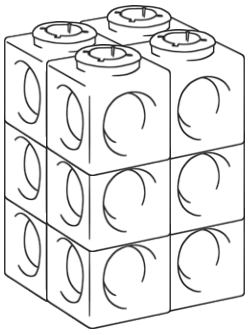


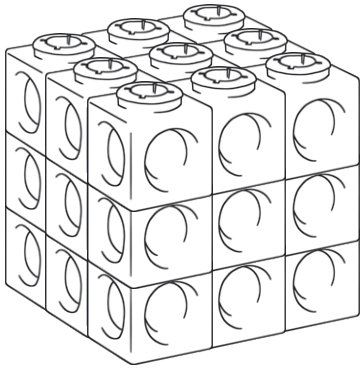


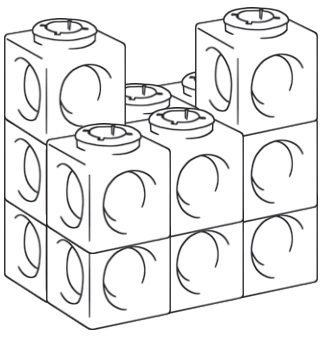


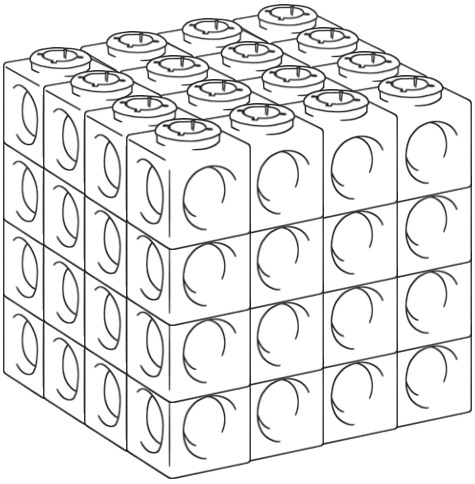


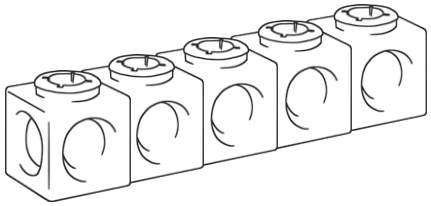












Discussion Prompts

1) Does the shape look complete or incomplete? How can you tell?
2) How many cubes can you count in total?
3) Can you count any dimensions of the shape?
4) Do you think this is a cube number or not? How do you know?
5) (For cube numbers only)
   What calculation would we use to find the cube number for this model?

$\square \times \square \times \square = \square$

Cube Numbers

To find cube numbers.

1) Complete the table.

Cube Notation	Calculation	Cube Number
1^3	1 × 1 × 1	
2^3		
	3 × 3 × 3	27
4^3		64
5^3	5 × 5 × 5	
		216

2) Compare these statements using <, > or =.
Show your working out in the boxes on the right.

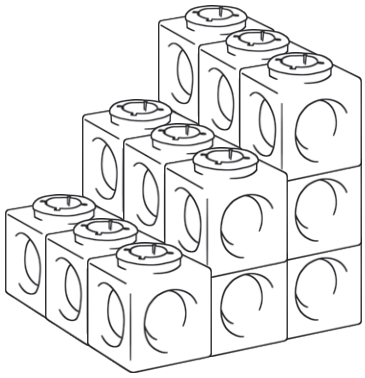
2 cubed ☐ **10 - 2**

7 × 7 × 7 ☐ **5 × 5 × 5**

10^3 ☐ **100**

3 squared ☐ **3 cubed**

3) Careful mathematicians like to prove their thinking using resources!
Build the model below using interlocking cubes.
Use the model to complete the maths statements below.



You need to add ☐ more cubes to make this a cube number.

The cube number that this model will then represent is ☐.

Each dimension of this cube is ☐, so the calculation to make this cube number is:

☐ × ☐ × ☐ = ☐

If you add one more cube to each dimension, the calculation and the cube number will become:

☐ × ☐ × ☐ = ☐

Cube Numbers

To find cube numbers.

1) Complete the table.

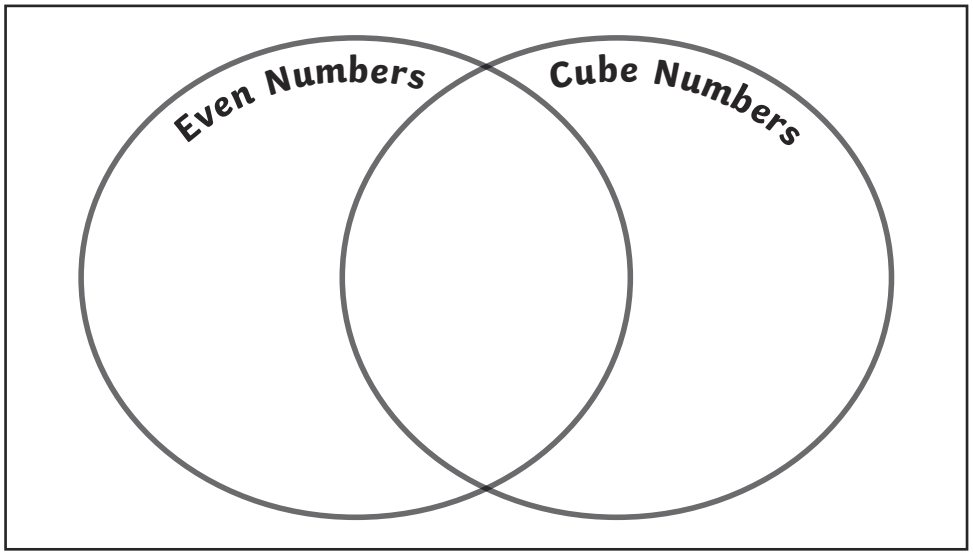
I used this method to solve the first one:

6 × 6 × 6 =
6 × 6 = 36
36 × 6 = 216

Cube Notation	Calculation	Cube Number
6^3	6 × 6 × 6	216
7^3		
8^3		
9^3		
10^3		
11^3		

2) Sort the numbers using the Venn diagram below.

8 **27** **64** **122** **125** **216** **280**



3) Solve the calculations below. Use the boxes to show your workings.

$4^3 = 54 + \square$

$25 + \square = 3^3$

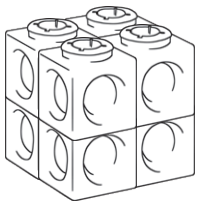
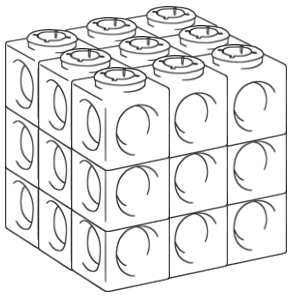
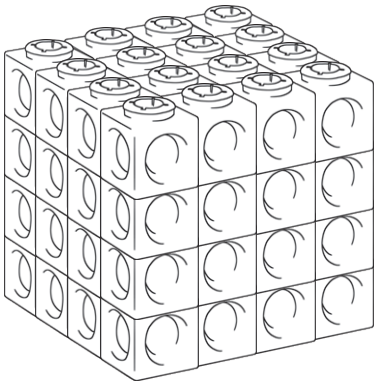
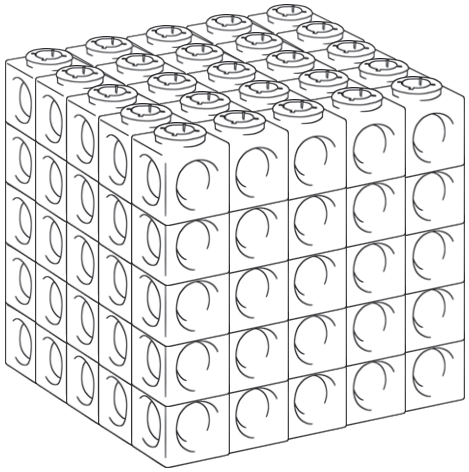
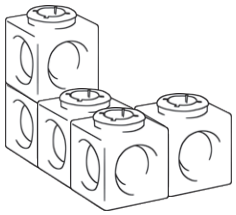
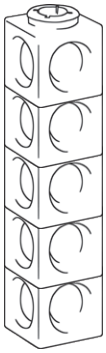
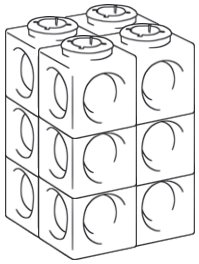
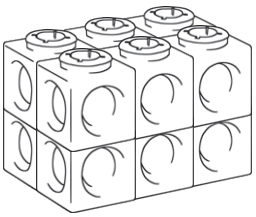
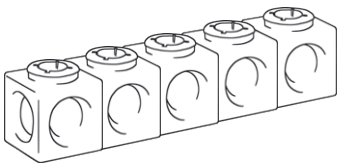
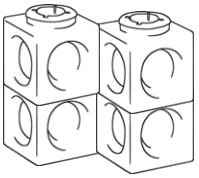
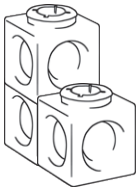
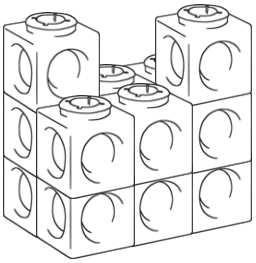
$\square - 25 = 5^3$

$\square^3 - 10^2 = 243$

4)

There is only one 2-digit number that is both a square and a cube number! Can you find it? How could you organise your working?

Cube Numbers **Answers**

Cube Numbers	Not Cube Numbers
   	       

Cube Numbers **Answers**

1) Complete the table.

Cube Notation	Calculation	Cube Number
1^3	1 × 1 × 1	**1**
2^3	**2 × 2 × 2**	**8**
3^3	3 × 3 × 3	27
4^3	**4 × 4 × 4**	64
5^3	5 × 5 × 5	**125**
6^3	**6 × 6 × 6**	216

2) Compare these statements using <, > or =.
Show your working out in the boxes on the right.

2 cubed **=** 10 - 2

2 × 2 × 2 = 8
10 - 2 = 8
8 = 8

7 × 7 × 7 **>** 5 × 5 × 5

7 × 7 × 7 = 343
5 × 5 × 5 = 125
343 > 125

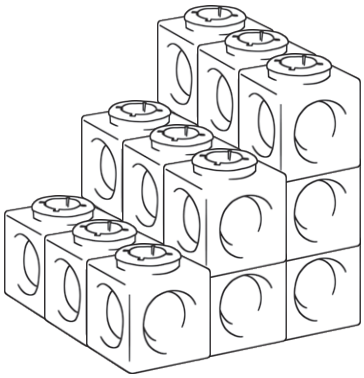
10^3 **>** 100

10 × 10 × 10 = 1000
1000 > 100

3 squared **<** 3 cubed

3 × 3 = 9
3 × 3 × 3 = 27
9 < 27

3) Use the model to complete the maths statements below.



You need to add **9** more cubes to make this a cube number.

The cube number that this model will then represent is **27**.

Each dimension of this cube is **3**, so the calculation to make this cube number is:

3 × **3** × **3** = **27**

If you add one more cube to each dimension, the calculation and the cube number will become:

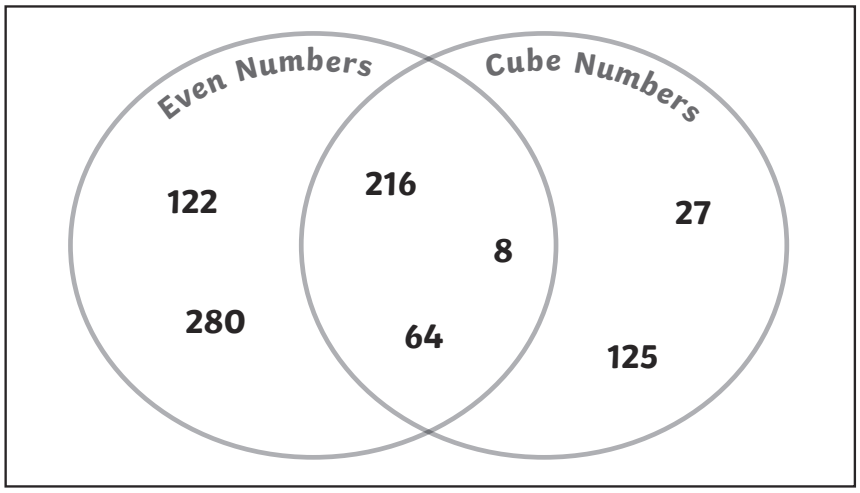
4 × **4** × **4** = **64**

Cube Numbers **Answers**

1) Complete the table.

Cube Notation	Calculation	Cube Number
6^3	6 × 6 × 6	216
7^3	**7 × 7 × 7**	**343**
8^3	**8 × 8 × 8**	**512**
9^3	**9 × 9 × 9**	**729**
10^3	**10 × 10 × 10**	**1000**
11^3	**11 × 11 × 11**	**1331**

2) Sort the numbers using the Venn diagram below.



3) Solve the calculations below.

$4^3 = 54 +$ **10**

$25 +$ **2** $= 3^3$

150 $- 25 = 5^3$

7 $^3 - 10^2 = 243$

4)

There is only one 2-digit number that is both a square and a cube number! Can you find it? How could you organise your working?

The answer is 64.

A systematic way of working out the answer would be to list all the two-digit square numbers and cube numbers. Then, compare both lists to find which number occurs twice.

Two-digit square numbers: 16, 25, 36, 49, (64) and 81

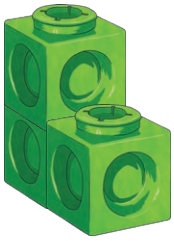
Two-digit cube numbers: 27, (64)

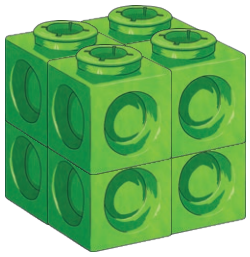
Cube Numbers

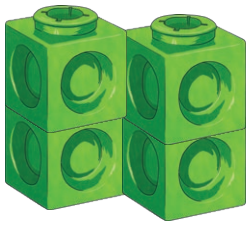
To find cube numbers.

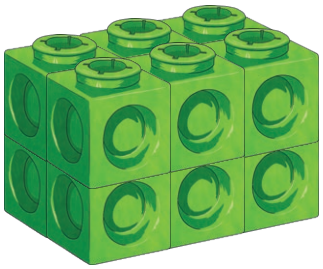
Adult Guided Task

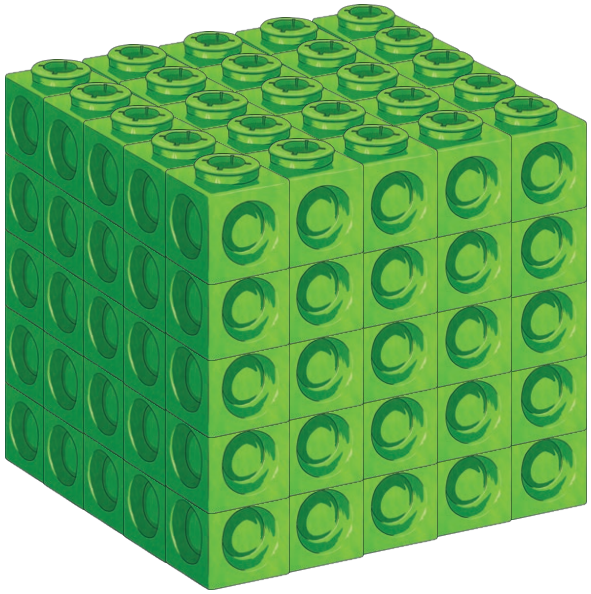
Use the activity cards and question prompts to have a discussion about cube numbers. Consider whether each image is showing a cube number or not and sort them into two piles. You could use sorting hoops to help you sort.

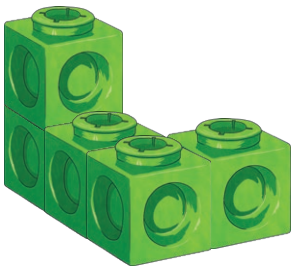


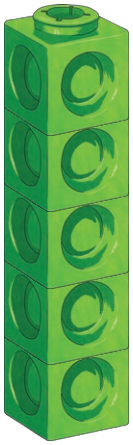


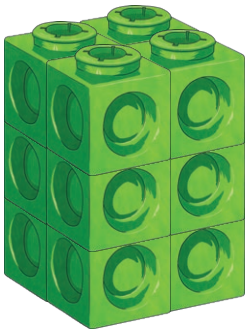


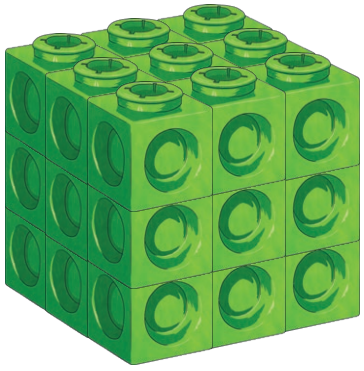


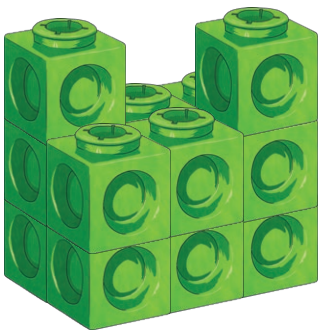


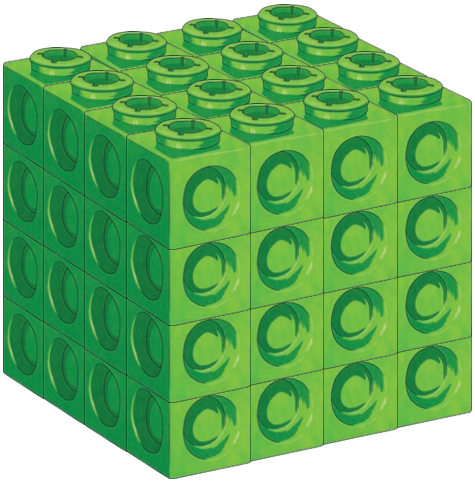


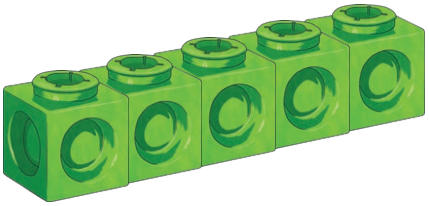












Discussion Prompts

1) Does the shape look complete or incomplete? How can you tell?
2) How many cubes can you count in total?
3) Can you count any dimensions of the shape?
4) Do you think this is a cube number or not? How do you know?
5) (For cube numbers only)
   What calculation would we use to find the cube number for this model?

$\square \times \square \times \square = \square$

Cube Numbers

To find cube numbers.

1) Complete the table.

Cube Notation	Calculation	Cube Number
1^3	$1 \times 1 \times 1$	
2^3		
	$3 \times 3 \times 3$	27
4^3		64
5^3	$5 \times 5 \times 5$	
		216

2) Compare these statements using <, > or =.
Show your working out in the boxes on the right.

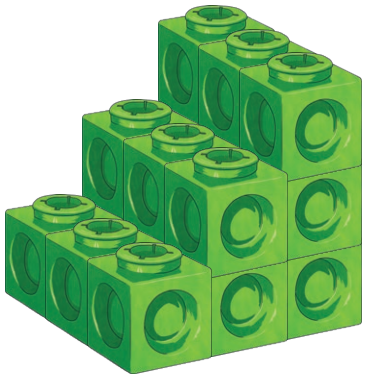
2 cubed ☐ 10 - 2

$7 \times 7 \times 7$ ☐ $5 \times 5 \times 5$

10^3 ☐ 100

3 squared ☐ 3 cubed

3) Careful mathematicians like to prove their thinking using resources!
Build the model below using interlocking cubes.
Use the model to complete the maths statements below.



You need to add ☐ more cubes to make this a cube number.

The cube number that this model will then represent is ☐.

Each dimension of this cube is ☐, so the calculation to make this cube number is:

☐ × ☐ × ☐ = ☐

If you add one more cube to each dimension, the calculation and the cube number will become:

☐ × ☐ × ☐ = ☐

Cube Numbers

To find cube numbers.

1) Complete the table.

I used this method to solve the first one:

$6 \times 6 \times 6 =$

$6 \times 6 = 36$

$36 \times 6 = 216$

Cube Notation	Calculation	Cube Number
6^3	$6 \times 6 \times 6$	216
7^3		
8^3		
9^3		
10^3		
11^3		

2) Sort the numbers using the Venn diagram below.

8

27

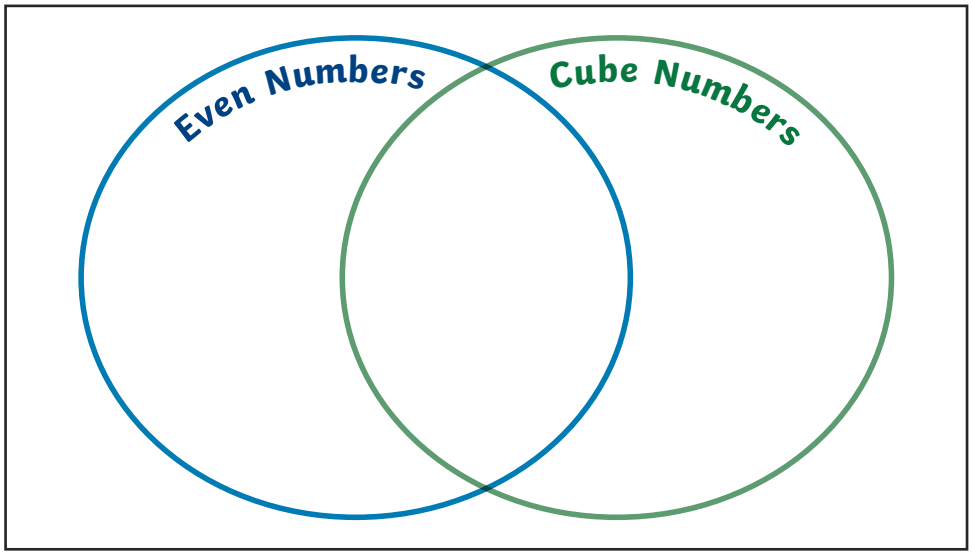
64

122

125

216

280



3) Solve the calculations below. Use the boxes to show your workings.

$4^3 = 54 + \square$

$25 + \square = 3^3$

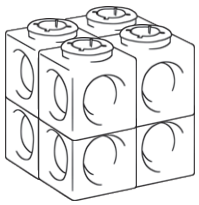
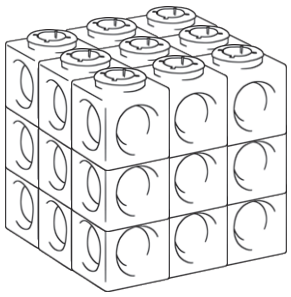
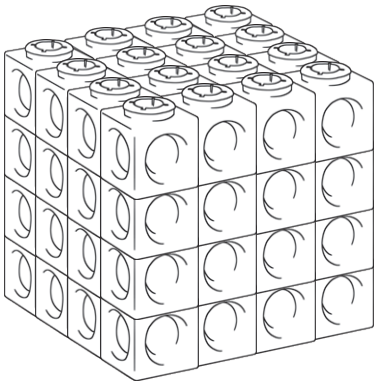
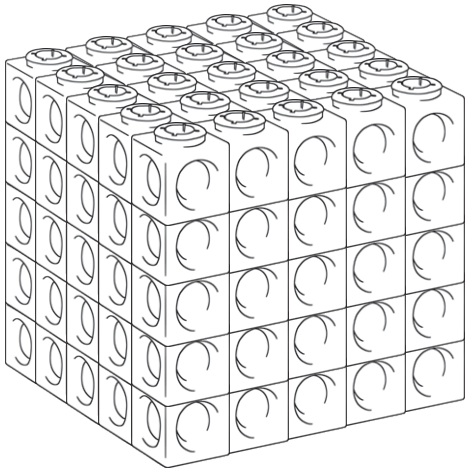
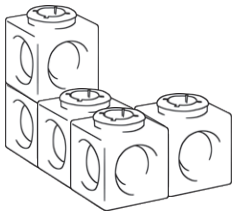
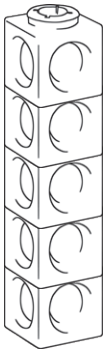
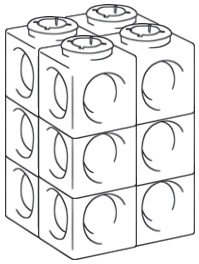
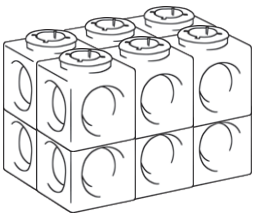
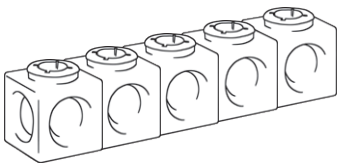
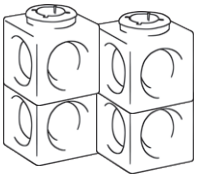
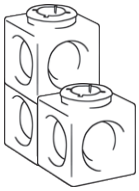
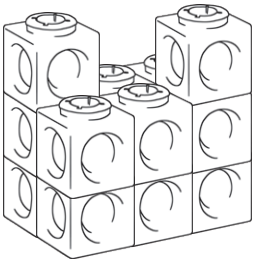
$\square - 25 = 5^3$

$\square^3 - 10^2 = 243$

4)

There is only one 2-digit number that is both a square and a cube number! Can you find it? How could you organise your working?

Cube Numbers **Answers**

Cube Numbers	Not Cube Numbers
   	       

Cube Numbers **Answers**

1) Complete the table.

Cube Notation	Calculation	Cube Number
1^3	1 × 1 × 1	**1**
2^3	**2 × 2 × 2**	**8**
3^3	3 × 3 × 3	27
4^3	**4 × 4 × 4**	64
5^3	5 × 5 × 5	**125**
6^3	**6 × 6 × 6**	216

2) Compare these statements using <, > or =.
Show your working out in the boxes on the right.

2 cubed **=** 10 - 2

2 × 2 × 2 = 8
10 - 2 = 8
8 = 8

7 × 7 × 7 **>** 5 × 5 × 5

7 × 7 × 7 = 343
5 × 5 × 5 = 125
343 > 125

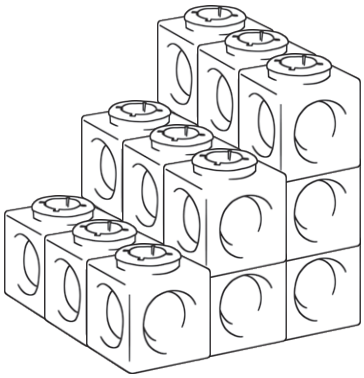
10^3 **>** 100

10 × 10 × 10 = 1000
1000 > 100

3 squared **<** 3 cubed

3 × 3 = 9
3 × 3 × 3 = 27
9 < 27

3) Use the model to complete the maths statements below.



You need to add **9** more cubes to make this a cube number.

The cube number that this model will then represent is **27**.

Each dimension of this cube is **3**, so the calculation to make this cube number is:

3 × **3** × **3** = **27**

If you add one more cube to each dimension, the calculation and the cube number will become:

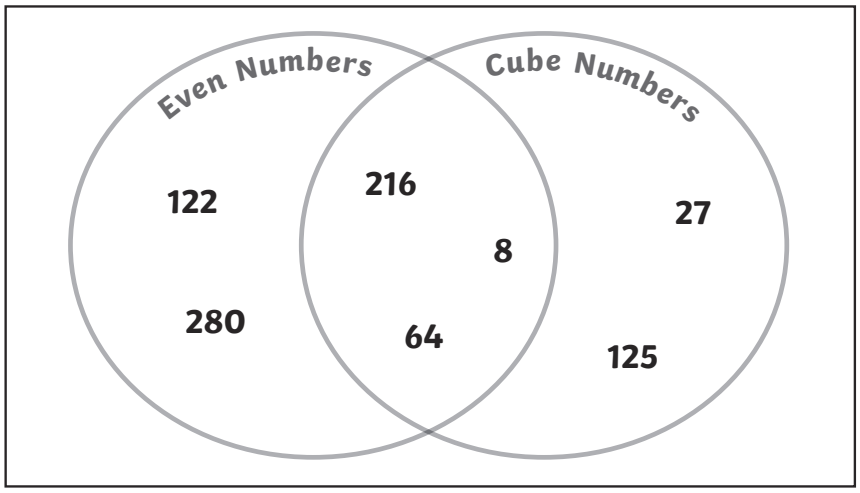
4 × **4** × **4** = **64**

Cube Numbers **Answers**

1) Complete the table.

Cube Notation	Calculation	Cube Number
6^3	6 × 6 × 6	216
7^3	**7 × 7 × 7**	**343**
8^3	**8 × 8 × 8**	**512**
9^3	**9 × 9 × 9**	**729**
10^3	**10 × 10 × 10**	**1000**
11^3	**11 × 11 × 11**	**1331**

2) Sort the numbers using the Venn diagram below.



3) Solve the calculations below.

$4^3 = 54 +$ **10**

$25 +$ **2** $= 3^3$

150 $- 25 = 5^3$

7 $^3 - 10^2 = 243$

4)

There is only one 2-digit number that is both a square and a cube number! Can you find it? How could you organise your working?

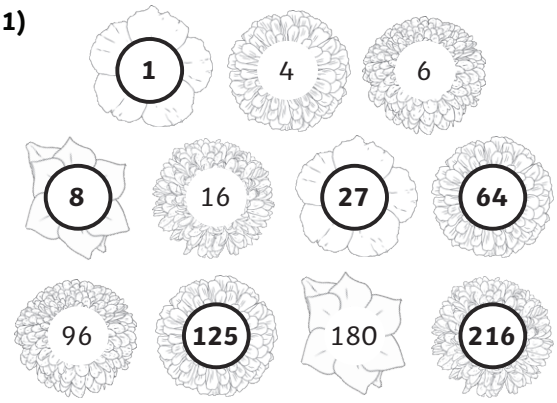
The answer is 64.

A systematic way of working out the answer would be to list all the two-digit square numbers and cube numbers. Then, compare both lists to find which number occurs twice.

Two-digit square numbers: 16, 25, 36, 49, (64) and 81

Two-digit cube numbers: 27, (64)

1)

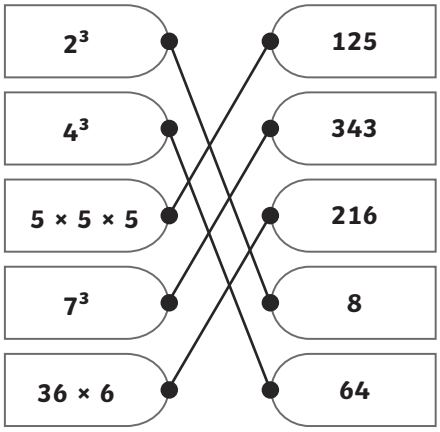


2) $2^3 + 12 = \mathbf{20}$

$\mathbf{73} = 100 - 3^3$

$4^3 = \mathbf{7}^2 + 15$

3)



1) **$4^3 + 40$ is the odd one out because it equals 104 whereas the other two calculations equal 100.**

2) **Anisha is not correct.**
$8^3 = 512$ and $11^2 = 121$.
$512 + 121 = 633$. 633 is not a cube number.
The next cube number after 512 is 729.

3) **Jack's method is correct. He has multiplied the first two numbers together first and then multiplied that number by ten.**

1) 729

2) a) ladybird = 4
butterfly = 6

or

ladybird = 6
butterfly =4

a) ladybird = 3
butterfly = 7

or

ladybird = 7
butterfly = 3

3) square number = 36
cube number = 216

or

square number = 225
cube number = 27

1) This bee can only land on cube numbers. Which flowers will the bee land on?

1 4 6 8 16 27 64 96 125 180 216

2) Solve the calculations below.

$2^3 + 12 =$ ☐

☐ $= 100 - 3^3$

$4^3 =$ ☐$^2 + 15$

3) Match the calculations to the answers.

2^3	125
4^3	343
$5 \times 5 \times 5$	216
7^3	8
36×6	64

1)

Which answer is the odd one out?
Explain your reasoning.

$2^3 + 92$

$5^3 - 25$

$4^3 + 40$

2)

The answer to $8^3 + 11^2$ is a cube number.

Is Anisha correct? Prove it!

3) Jack has calculated 10^3 using the method below.

$$10^3 = 10 \times 10 \times 10$$
$$= 100 \times 10$$
$$= 1000$$

Is Jack's method correct? How do you know?

1) Who am I?

- I am a 3-digit cube number.
- I am less than 800.
- One of my digits is even.
- I am also a square number.

2) Find the values of:  and  so that:

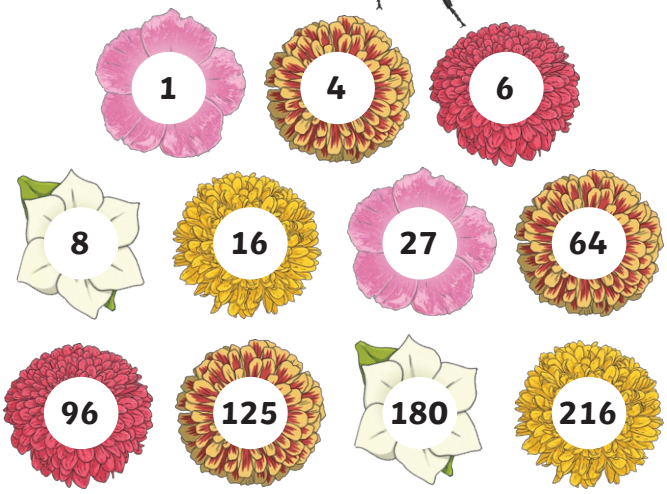
a)  ^{3} +  ^{3} = 280 and  +  = 10

b)  ^{3} +  ^{3} = 370 and  +  = 10

3) The sum of a square number and a cube number equals 252. Find the missing numbers.

$\square$ + $\square$ = 252

1) This bee can only land on cube numbers. Which flowers will the bee land on?



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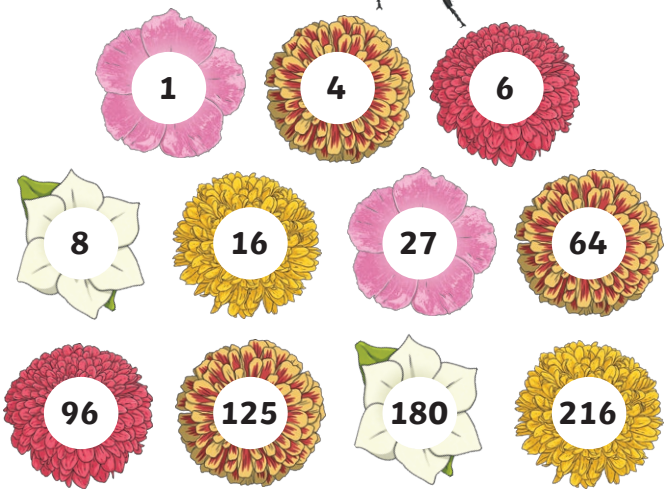

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