LESSON MAKER PRO

Squares and Cubes

Use models to connect equal lengths to area and volume.

GRADE 6 · NY-6.G.5

NY-6.G.5 "Use area and volume models to explain perfect squares and perfect cubes."

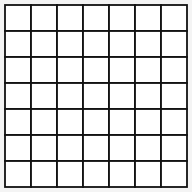
NAME _____ DATE _____

MODEL THE PATTERN

When a square has a whole-number side length, its area is side length × side length, which is a perfect square. When a cube has a whole-number edge length, its volume is edge length × edge length × edge length, which is a perfect cube. Area models show equal rows and columns, and volume models show equal lengths, widths, and heights.

WORKED EXAMPLE

Use the square array shown. Find its area and write the area as a perfect square.

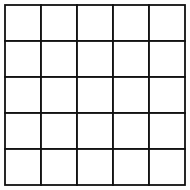


1. Count 7 rows and 7 columns.
2. Multiply 7 × 7 = 49.
3. Write 49 as 7^2. It is a perfect square.

Answer: 49 square units = 7^2

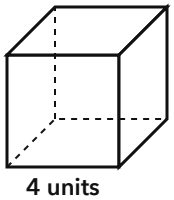
PRACTICE 6 problems

1 Use the square array shown. Find its area and write it as a perfect square.



ANSWER _____

2 Use the cube shown. Find its volume and write it as a perfect cube.



ANSWER _____

3 A square has a whole-number side length of 9 units. Find its area. Is the area a perfect square?

ANSWER _____

_____

4 A cube has a whole-number edge length of 3 cm. Find its volume. Is the volume a perfect cube?

ANSWER _____

_____

5 A square floor has an area of 121 square feet. What is its whole-number side length? Write the area as a perfect square.

ANSWER _____

_____

6 A cube has a volume of 125 cubic units. What is its whole-number edge length? Write the volume as a perfect cube.

ANSWER _____

_____

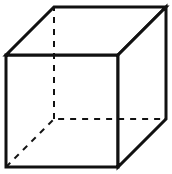
APPLY IT Show your work

1 A student makes a square photo-collage board with a side length of 12 inches. What is the area of the board? Explain why the area is a perfect square.

WORK SPACE

ANSWER _____

2 A game club uses a cube-shaped storage box with edges that are 6 cm long. What volume can the box hold? Explain why the volume is a perfect cube.



ANSWER _____

CHALLENGE One step up

A square has an area of 36 square units, and a cube has a volume of 216 cubic units. Find the square's side length and the cube's edge length. Explain why one number is a perfect square and the other is a perfect cube.

WORK SPACE AND ANSWER

ANSWER KEY # Squares and Cubes

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the square array shown. Find its area and write it as a perfect square.	**25 square units = 5^2**
2	Use the cube shown. Find its volume and write it as a perfect cube.	**64 cubic units = 4^3**
3	A square has a whole-number side length of 9 units. Find its area. Is the area a perfect square?	**81 square units; yes, 81 = 9^2.**
4	A cube has a whole-number edge length of 3 cm. Find its volume. Is the volume a perfect cube?	**27 cubic cm; yes, 27 = 3^3.**
5	A square floor has an area of 121 square feet. What is its whole-number side length? Write the area as a perfect square.	**11 feet; 121 = 11^2.**
6	A cube has a volume of 125 cubic units. What is its whole-number edge length? Write the volume as a perfect cube.	**5 units; 125 = 5^3.**

PART 2 · APPLY IT

1. **144 square inches; 144 = 12^2, so it is a perfect square.** Multiply the equal side lengths: 12 × 12 = 144. Because the area is a whole number multiplied by itself, it is a perfect square.
2. **216 cubic cm; 216 = 6^3, so it is a perfect cube.** Multiply the three equal edge lengths: 6 × 6 × 6 = 216. Because the volume is a whole number multiplied by itself three times, it is a perfect cube.

CHALLENGE

The square's side length is 6 units because 36 = 6^2. The cube's edge length is 6 units because 216 = 6^3. 36 is a perfect square, and 216 is a perfect cube.

Accept equivalent multiplication statements, such as 12 × 12 for 12^2 and 6 × 6 × 6 for 6^3. Students should connect a perfect square to equal whole-number side lengths and a perfect cube to equal whole-number edge lengths.