LESSON MAKER PRO

Rectangle Detectives

Compare the space inside with the distance around.

GRADE 4 · 4.MG.3.d

4.MG.3.d "Use concrete materials and pictorial models to explore the relationship between area and perimeter of rectangles."

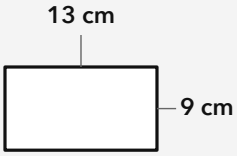
NAME _____ DATE _____

INSIDE AND AROUND

Area tells how much space is inside a rectangle. Multiply the length by the width to find area. Perimeter tells the distance around a rectangle. Add all four sides, or use 2 × (length + width). For the challenge, your teacher supplies 24 equal square tiles and grid paper. Use one tile edge as one unit. Keep all 24 tiles in each rectangle; build, draw and count the outside boundary.

WORKED EXAMPLE

Find the area and perimeter of the rectangle shown.

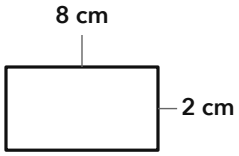


1. Area = 13 cm × 9 cm.
2. Area = 117 square cm.
3. Perimeter = 13 cm + 9 cm + 13 cm + 9 cm = 44 cm.

Answer: Area: 117 square cm; Perimeter: 44 cm

PRACTICE 6 problems

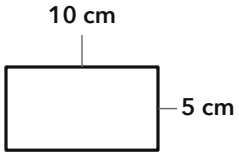
1 The rectangle is 8 cm by 2 cm. Find its area and perimeter.



ANSWER _____

_____

2 The rectangle is 10 cm by 5 cm. Find its area and perimeter.



ANSWER _____

_____

3 A rectangle has an area of 48 square units and a width of 8 units. Find its length and perimeter.

ANSWER _____

_____

4 Rectangle A is 7 cm by 3 cm. Rectangle B is 5 cm by 4 cm. Which rectangle has the greater area? Find that rectangle's perimeter.

ANSWER _____

_____

5 A rectangle has an area of 32 square units and a perimeter of 24 units. What are its side lengths?

ANSWER _____

6 A rectangle has a perimeter of 28 cm and a width of 4 cm. What are its length and area?

ANSWER _____

_____

APPLY IT Show your work

1 Mia is making a rectangular trading-card display that is 11 inches long and 8 inches wide. How many square inches of display space will she have? How many inches of border trim does she need to go all the way around it?

WORK SPACE

ANSWER _____

2 A school chalk game court is a rectangle with an area of 48 square meters. Its width is 6 meters. What is the court's length? How many meters of rope are needed to mark its boundary?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Actually arrange all 24 supplied square tiles into every different whole-number rectangle, with no gaps or overlaps. Treat rotations as the same pair. On supplied grid paper, draw each arrangement and record length, width, area and outside perimeter. Which pair needs the least border material? Explain what your builds show about rectangles with the same area.

WORK SPACE AND ANSWER

ANSWER KEY

Rectangle Detectives

GRADE 4 · 4.MG.3.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The rectangle is 8 cm by 2 cm. Find its area and perimeter.	**Area: 16 square cm; Perimeter: 20 cm**
2	The rectangle is 10 cm by 5 cm. Find its area and perimeter.	**Area: 50 square cm; Perimeter: 30 cm**
3	A rectangle has an area of 48 square units and a width of 8 units. Find its length and perimeter.	**Length: 6 units; Perimeter: 28 units**
4	Rectangle A is 7 cm by 3 cm. Rectangle B is 5 cm by 4 cm. Which rectangle has the greater area? Find that rectangle's perimeter.	**Rectangle A; 20 cm**
5	A rectangle has an area of 32 square units and a perimeter of 24 units. What are its side lengths?	**4 units and 8 units**
6	A rectangle has a perimeter of 28 cm and a width of 4 cm. What are its length and area?	**Length: 10 cm; Area: 40 square cm**

PART 2 · APPLY IT

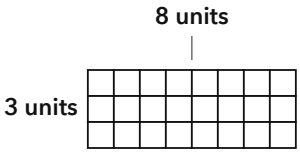
1. **88 square inches of display space; 38 inches of border trim** Multiply 11 by 8 to find the area. Add 11 + 8 + 11 + 8 to find the perimeter.
2. **Length: 8 meters; Rope needed: 28 meters** Divide 48 by 6 to find the length. Then add 8 + 6 + 8 + 6 for the boundary.

CHALLENGE

Build and draw 1-by-24, 2-by-12, 3-by-8 and 4-by-6 rectangles. Every area is 24 square units. Their perimeters are 50, 28, 22 and 20 units. The 4-by-6 rectangle needs the least border. The same tile count fixes area, but rearranging changes side lengths and perimeter. Check actual builds and matching drawings, not only the numeric list.

Accept side lengths in either order. Accept equivalent unit wording, such as square centimeters for square cm, when the value and unit type are correct. The challenge requires actual reuse of the same 24 concrete tiles and four corresponding drawings on the supplied paper. Count only the outside boundary; rotations do not add different length-width pairs.

Challenge example: 3-by-8 arrangement, area 24 and perimeter 22.



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Challenge example: 4-by-6 arrangement, area 24 and perimeter 20.

