

Inside and Around

Estimate, then find area and perimeter.

GRADE 3 • 3.MG.2

3.MG.2 "The student will use multiple representations to estimate and solve problems, including those in context, involving area and perimeter (in both U.S. Customary and metric units). Solve problems, including those in context..."

NAME _____

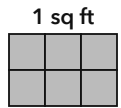
DATE _____

Materials and setup

Pencil and blank paper for the final construction. Diagrams represent stated units; printing size does not change the values.

TRY THE IDEA

Area measures covered space in square units. Perimeter measures the outside boundary in length units. Estimate before counting or adding; then check the exact model.



WORKED EXAMPLE

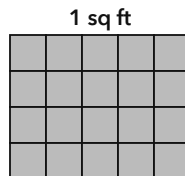
Each small square represents 1 square foot. Find the area of this mat.

1. There are 2 rows of 3 squares.
2. 2 times 3 = 6 squares.

Answer: Area = 6 square feet.

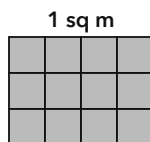
PRACTICE 4 problems

- 1** Each square represents 1 square foot. First glance at the rug and write an area estimate. Then count or multiply to find its area. Write both with units.



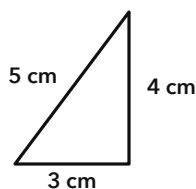
ANSWER _____

- 2** Each small square has side length 1 meter. First write an estimate for the distance around the OUTSIDE. Then count boundary units to find the perimeter.



ANSWER _____

- 3** The side lengths are labeled; the drawing is not a measuring tool. How much ribbon goes once around the triangle? Show the addition and unit.



ANSWER _____

- 4** Each square represents 1 square inch. Find both the area and perimeter. Label each answer with the correct unit.



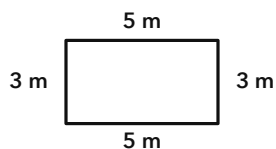
ANSWER _____

APPLY IT Show your work

- 1** Each tile covers 1 square foot. The whole rectangular corner will be tiled. Find how many tiles are needed. Also find the border length in feet.



- 2** The labeled lengths are in meters; do not measure the picture. Find the fence length needed around the garden. Then find its area and explain aloud why the units differ.



CHALLENGE One step up

Compare the 2-by-5 model in task 4 with a rectangle made of 1 row of 10 one-inch squares. On separate paper, draw that row. Find both areas and perimeters. Must equal areas have equal perimeters?

WORK SPACE AND ANSWER

PRACTICE 1

Estimate varies; area = $4 \times 5 = 20$ square feet.

PRACTICE 2

Estimate varies; perimeter = $4 + 3 + 4 + 3 = 14$ meters.

PRACTICE 3

$3 + 4 + 5 = 12$ centimeters.

PRACTICE 4

Area = $2 \times 5 = 10$ square inches. Perimeter = $5 + 2 + 5 + 2 = 14$ inches.

APPLY IT 1

18 tiles cover 18 square feet. The border is $6 + 3 + 6 + 3 = 18$ feet.
Count 3 rows of 6 tiles. The outside border uses two 6-foot and two 3-foot sides.

APPLY IT 2

Perimeter = $5 + 3 + 5 + 3 = 16$ meters. Area = $5 \times 3 = 15$ square meters. Length units go around; square units cover inside.
Add all four side lengths for the boundary; multiply 5 by 3 for the area.

CHALLENGE

Both areas are 10 square inches. The 2-by-5 perimeter is 14 inches; the 1-by-10 perimeter is 22 inches. Equal areas can have different perimeters.

Supply blank paper and pencils for the final drawing. Students estimate tasks 1 and 2 before exact counting; accept sensible estimates without requiring one fixed estimate. Arrays show the covered region; count only the outside unit edges for perimeter. Labeled polygon pictures need not be physically to scale. Require every area and perimeter result and its unit, not a category label.