

Design a Reading Nook

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Overview

Students design a classroom reading nook on grid paper. They count square units, multiply side lengths, split rectangles with the distributive property and find the area of an L-shaped corner.

Time: 2 class periods · **Product:** Reading Nook Floor Plan
Standards: 3.MD.C.5.a, 3.MD.C.5.b, 3.MD.C.6, 3.MD.C.7.a, 3.MD.C.7.b, 3.MD.C.7.c, 3.MD.C.7.d
Prerequisite skills: Arrays and multiplication facts (Units 1–3)

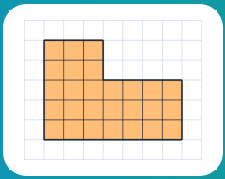
Learning targets

- I can find area by counting unit squares and name it in square units.
- I can find the area of a rectangle by multiplying side lengths.
- I can find the area of a rectilinear figure by splitting it into rectangles.

Timing and materials

- Day 1 (45 min): rugs and mats by tiling and multiplying (Parts 1–2).
- Day 2 (45 min): the L-shaped corner and the final floor plan (Parts 3–4).

Materials: Grid paper (1 square = 1 square foot, printable support page); Square tiles (optional); Colored pencils; Rulers. No accounts, paid products or student personal information are needed.



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The three versions

- Remedial: hints for a first step, partly filled tables, sentence frames and fewer open choices; the same learning targets.
- Standard: the full task set at grade level; students choose their strategies and models.
- Advanced: open design constraints, missing information, error analysis and a written justification; no hints.

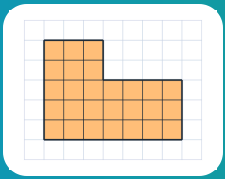
All versions use the same context and learning targets, so groups can share and compare work.

Implementation notes

- Check that every area answer uses square units.
- Have students shade each rectangle in a different color before adding areas.
- Advanced students meet area and space limits and compare two designs.
- Before Part 1, read the challenge aloud and ask students to restate the goal.
- Close with a gallery walk: each group explains one strategy.

Rubric

Learning target	4 Exceeds	3 Meets	2 Approaching	1 Beginning
I can find area by counting unit squares and name it in square units.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can find the area of a rectangle by multiplying side lengths.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can find the area of a rectilinear figure by splitting it into rectangles.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can explain my thinking with pictures, numbers and words.	Clear for every part	Clear for most parts	Some explanation	Little explanation
My reading nook floor plan is complete and matches my math.	Complete, neat, accurate	Complete	Partly complete	Not complete



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Solutions · Remedial KEY

Part 1: The Rug

The rug is 4 feet long and 3 feet wide. Each grid square is 1 square foot.

1. Draw the rug on grid paper. How many square feet does it cover?

12 square feet

2. Write a multiplication equation for its area.

4 × 3 = 12

Part 2: Break Apart the Mat

A floor mat is 6 feet by 6 feet. Split the long side into 2 and 4.

3. Find the area of each part.

6 × 2 = 12 and 6 × 4 = 24

4. Add to find the area of the whole mat.

36 square feet

Part 3: The L-Shaped Corner

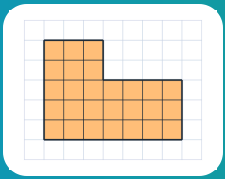
The corner is 6 feet across the bottom and 5 feet up the left side. The bottom part is 2 feet tall, and the top part is 3 feet wide.

5. Split the corner into two rectangles. Write the area of each.

6 × 2 = 12 and 3 × 3 = 9

6. What is the area of the whole corner?

21 square feet



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Part 4: Floor Plan

Draw your nook with the rug and the mat in the L-shaped corner. Label each area.

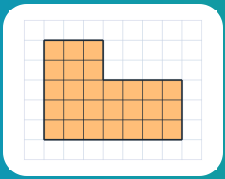
7. Your plan with labels.

Answers vary; labels must match the drawing.

Extension

Find two different rugs that each cover 24 square feet.

Examples: 4 by 6, 3 by 8, 2 by 12



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Solutions · Standard KEY

Part 1: The Rug

The rug is 6 feet long and 4 feet wide. Each grid square is 1 square foot.

1. Draw the rug on grid paper. How many square feet does it cover?
24 square feet

2. Write a multiplication equation for its area.
6 × 4 = 24

Part 2: Break Apart the Mat

A floor mat is 7 feet by 8 feet. Split the long side into 5 and 3.

3. Find the area of each part.
7 × 5 = 35 and 7 × 3 = 21

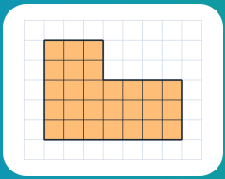
4. Add to find the area of the whole mat.
56 square feet

Part 3: The L-Shaped Corner

The corner is 9 feet across the bottom and 7 feet up the left side. The bottom part is 3 feet tall, and the top part is 4 feet wide.

5. Split the corner into two rectangles. Write the area of each.
9 × 3 = 27 and 4 × 4 = 16

6. What is the area of the whole corner?
43 square feet



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Part 4: Floor Plan

Draw your nook with the rug and the mat in the L-shaped corner. Label each area.

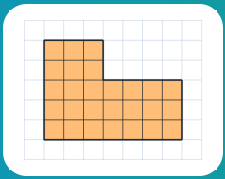
7. Your plan with labels.

Answers vary; labels must match the drawing.

Extension

Find two different rugs that each cover 24 square feet.

Examples: 4 by 6, 3 by 8, 2 by 12



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Solutions · Advanced KEY

Part 1: The Rug

The rug is 8 feet long and 6 feet wide. Each grid square is 1 square foot.

1. Draw the rug on grid paper. How many square feet does it cover?
   48 square feet
2. Write a multiplication equation for its area.
   8 × 6 = 48

Part 2: Break Apart the Mat

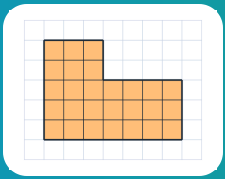
A floor mat is 9 feet by 12 feet. Split the long side into 7 and 5.

3. Find the area of each part.
   9 × 7 = 63 and 9 × 5 = 45
4. Add to find the area of the whole mat.
   108 square feet

Part 3: The L-Shaped Corner

The corner is 12 feet across the bottom and 9 feet up the left side. The bottom part is 4 feet tall, and the top part is 5 feet wide.

5. Split the corner into two rectangles. Write the area of each.
   12 × 4 = 48 and 5 × 5 = 25
6. What is the area of the whole corner?
   73 square feet



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Part 4: Design Challenge

The nook can use at most 73 square feet. You want one rug plus two pillow mats that are 2 by 3 feet.

7. Give rug side lengths so everything fits in 73 square feet. Show the area total.

Answers vary; the rug area must be at most 61 square feet, e.g. 10 by 6 = 60 square feet.

8. Jaden says the corner is 12 × 9 = 108 square feet. Explain his mistake.

He used the whole rectangle around the L and counted the missing corner.

Extension

Find two different rugs that each cover 24 square feet.

Examples: 4 by 6, 3 by 8, 2 by 12