LESSON MAKER PRO

Fraction Area Lab

Use side lengths to find rectangle area.

GRADE 5 · 5.NF.B.4b

CCSS.Math.Content.5.NF.B.4b "Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths..."

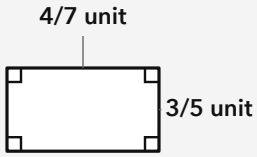
NAME _____ DATE _____

TILE, THEN MULTIPLY

A rectangle with fractional side lengths can be tiled with small equal squares. The total area from the tiles is the same as the product of the two side lengths.

WORKED EXAMPLE

Use the rectangle shown. Find its area by thinking about unit-fraction tiles, then multiply the side lengths.

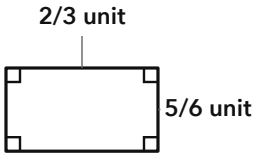


1. Use squares that are 1/35 unit by 1/35 unit.
2. 4/7 = 20/35 and 3/5 = 21/35.
3. There are 20 × 21 = 420 small squares.
4. 420/1225 = 12/35, and 4/7 × 3/5 = 12/35.

Answer: 12/35 square unit

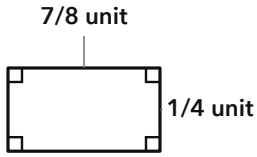
PRACTICE 4 problems

1 Find the area of the rectangle shown.



ANSWER _____

2 Find the area of the rectangle shown.



ANSWER _____

3 A rectangle is 3/8 unit long and 4/9 unit wide. Find its area.

ANSWER _____

4 A rectangle is 1 1/2 feet long and 2/5 foot wide. Find its area.

ANSWER _____

APPLY IT Show your work

1 A video game poster is 3/4 yard wide and 2/3 yard tall. What is its area?

WORK SPACE

ANSWER _____

2 Kai makes a rectangular cover for a comic sketchbook. It is 5/8 foot wide and 4/5 foot long. What area of material does Kai need?

WORK SPACE

ANSWER _____

3 Draw and tile: Use a ruler to draw a rectangle 3 cm long and 2 cm wide. In this scale drawing, 4 cm represents 1 unit, so its side lengths represent 3/4 unit and 1/2 unit. Mark every 1 cm along each side and draw the grid through the rectangle to form equal square tiles. Each tile side represents 1/4 unit. Count the drawn tiles. Find one tile's area and the total tile area, then compare with 3/4 × 1/2. Explain why the results agree.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A rectangle is 1 1/4 units by 2/3 unit. Explain how tiles that are 1/12 unit by 1/12 unit show the same area as multiplication.

WORK SPACE AND ANSWER

ANSWER KEY

Fraction Area Lab

GRADE 5 · 5.NF.B.4b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the area of the rectangle shown.	**5/9 square unit**
2	Find the area of the rectangle shown.	**7/32 square unit**
3	A rectangle is 3/8 unit long and 4/9 unit wide. Find its area.	**1/6 square unit**
4	A rectangle is 1 1/2 feet long and 2/5 foot wide. Find its area.	**3/5 square foot**

PART 2 · APPLY IT

1. **1/2 square yard** Multiply 3/4 × 2/3 = 6/12. Simplify 6/12 to 1/2.
2. **1/2 square foot** Multiply 5/8 × 4/5 = 20/40. Simplify 20/40 to 1/2.
3. **6 square tiles; each has area 1/16 square unit. Total 6/16=3/8 square unit, equal to 3/4 × 1/2.** The actual drawing is 3 columns by 2 rows of 1 cm squares. Each models a 1/4-by-1/4-unit tile, so each area is 1/16. Six such tiles cover the rectangle with no gaps/overlaps; 6×1/16=3/8. Multiplying 3/4×1/2 also gives 3/8.

CHALLENGE

1 1/4 = 15/12 and 2/3 = 8/12, so the rectangle has 15 × 8 = 120 tiles. Each tile has area 1/144 square unit, so 120/144 = 5/6 square unit. Also, 1 1/4 × 2/3 = 5/4 × 2/3 = 5/6.

Accept equivalent simplified area fractions with correct square units. For the challenge, accept any clear explanation using 120 tiles of area 1/144 square unit and a product of 5/6. Supply a centimetre ruler for Apply It 3. Check the actual 3-by-2 grid drawing, six equal square tiles, fractional side labels, one-tile area and count-to-product explanation. Numerical multiplication alone does not complete this tiling task.

Fraction Area Lab

Apply It 3 completed tiling: 6 squares, each edge 1/4 unit and area 1/16 square unit; total 3/8 square unit.

