

Fraction Area Lab

Tile, multiply, and compare rectangle areas.

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 IT, THEN MULTIPLY

To find the area of a rectangle with fractional side lengths, split each side into equal unit-fraction lengths. Count the equal tiles, then multiply the length by the width. Both methods give the same area.

WORKED EXAMPLE

Find the area of a rectangle that is $\frac{2}{3}$ unit long and $\frac{4}{5}$ unit wide.

1. Split the length into 2 parts of $\frac{1}{3}$ and the width into 4 parts of $\frac{1}{5}$.
2. The rectangle has $2 \times 4 = 8$ equal tiles.
3. Each tile has area $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$ square unit.
4. $8 \times \frac{1}{15} = \frac{8}{15}$, and $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$.

Answer: $\frac{8}{15}$ square unit

PRACTICE 6 problems

- 1** Find the area of a rectangle that is $\frac{1}{2}$ unit long and $\frac{3}{4}$ unit wide.

ANSWER _____

- 2** Find the area of a rectangle that is $\frac{5}{6}$ unit long and $\frac{3}{7}$ unit wide.

ANSWER _____

- 3** A rectangle is $\frac{3}{8}$ unit by $\frac{5}{8}$ unit. If it is tiled with squares that have side length $\frac{1}{8}$ unit, how many tiles cover it? What is its area?

ANSWER _____

- 4** Find the area of a rectangle that is $\frac{4}{7}$ unit long and $\frac{3}{10}$ unit wide.

ANSWER _____

- 5** Find the area of a rectangle that is $1\frac{3}{4}$ units long and $\frac{2}{5}$ unit wide.

ANSWER _____

- 6** A rectangle is $\frac{5}{9}$ unit by $\frac{2}{9}$ unit. If it is tiled with squares that have side length $\frac{1}{9}$ unit, how many tiles cover it? What is its area?

ANSWER _____

APPLY IT Show your work

- 1** The art club makes a rectangular panel for its gaming display. The panel is $\frac{7}{8}$ meter wide and $\frac{4}{11}$ meter tall. What is the area of the panel?

WORK SPACE

ANSWER _____

- 2** A student plants a rectangular snack-pea garden that is $\frac{3}{5}$ meter long and $\frac{7}{12}$ meter wide. What is the area of the garden?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular banner is $1\frac{1}{2}$ yards long and $\frac{3}{4}$ yard wide. Imagine covering it with tiles that are $\frac{1}{2}$ yard by $\frac{1}{4}$ yard. How many tiles cover the banner? Explain why the tile total gives the same area as multiplying the side lengths.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Find the area of a rectangle that is $\frac{1}{2}$ unit long and $\frac{3}{4}$ unit wide.	$\frac{3}{8}$ square unit
2	Find the area of a rectangle that is $\frac{5}{6}$ unit long and $\frac{3}{7}$ unit wide.	$\frac{5}{14}$ square unit
3	A rectangle is $\frac{3}{8}$ unit by $\frac{5}{8}$ unit. If it is tiled with squares that have side length $\frac{1}{8}$ unit, how many tiles cover it? What is its area?	15 tiles; $\frac{15}{64}$ square unit
4	Find the area of a rectangle that is $\frac{4}{7}$ unit long and $\frac{3}{10}$ unit wide.	$\frac{6}{35}$ square unit
5	Find the area of a rectangle that is $1\frac{3}{4}$ units long and $\frac{2}{5}$ unit wide.	$\frac{7}{10}$ square unit
6	A rectangle is $\frac{5}{9}$ unit by $\frac{2}{9}$ unit. If it is tiled with squares that have side length $\frac{1}{9}$ unit, how many tiles cover it? What is its area?	10 tiles; $\frac{10}{81}$ square unit

PART 2 • APPLY IT

- $\frac{7}{22}$ square meter** Multiply the side lengths: $\frac{7}{8} \times \frac{4}{11} = \frac{28}{88} = \frac{7}{22}$.
- $\frac{7}{20}$ square meter** Multiply the side lengths: $\frac{3}{5} \times \frac{7}{12} = \frac{21}{60} = \frac{7}{20}$.

CHALLENGE

9 tiles; each tile has area $\frac{1}{8}$ square yard, so $9 \times \frac{1}{8} = \frac{9}{8}$ square yards. Also, $1\frac{1}{2} \times \frac{3}{4} = \frac{3}{2} \times \frac{3}{4} = \frac{9}{8}$ square yards.

Accept equivalent fraction forms, but the simplified area is shown in the key. For items that ask about tiles, students must give both the tile count and the area.