Lesson 8-6

Thursday, January 2, 2020 1:37 PM

Name _____

Solve

Lesson 8-6
Area of a Rectangle

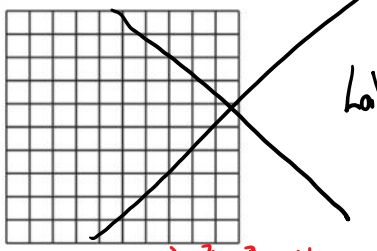
I can ...
find the area of a rectangle.

Content Standard 5.NF.B.4b
Mathematical Practices MP.1, MP.2, MP.3, MP.5, MP.6

Solve & Share

A rectangular poster is $\frac{1}{4}$ yard wide and $\frac{3}{4}$ yard tall. What is its area? *Solve this problem any way you choose.*

You can use appropriate tools, like grid paper, to solve the problem.



Area = length x width
A = l x w

Labels are: square units
units squared
$units^2$

A = l x w
A = $\frac{3}{4}$ yd x $\frac{1}{4}$ yd
A = $\frac{3}{16}$ yds^2

length 1 square: $\frac{1}{4}$ yd

Area of 1 square $\frac{1}{16}$ yd^2

Look Back! MP.2 Reasoning Is the area of a poster that is $\frac{3}{4}$-yard wide and $\frac{1}{4}$-yard tall the same as the area of the poster above? Explain.

$\frac{3}{4} \times \frac{1}{4} = \frac{1}{4} \times \frac{3}{4}$

Yes because of the Commutative Property.

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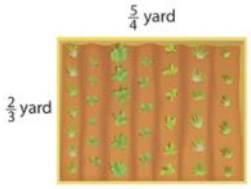
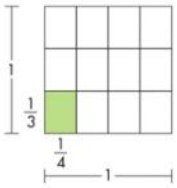
How Can You Find the Area of a Rectangle with Fractional Side Lengths?

Jenny has a rectangular garden. What is the area of her garden?



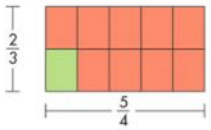
Step 1

$\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$ because 12 rectangles each $\frac{1}{4}$ wide and $\frac{1}{3}$ high fit in a unit square.



Step 2

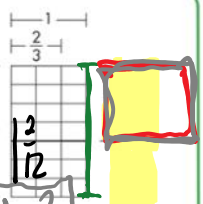
A rectangle of width $\frac{5}{4}$ yards and height $\frac{2}{3}$ yard is tiled with 5 × 2 rectangles of area $\frac{1}{12}$.



So, $\frac{5}{4} \times \frac{2}{3} = \frac{5 \times 2}{4 \times 3} = \frac{10}{12}$.

The area of Jenny's garden is $\frac{10}{12}$ square yard.

Convince Me! MP.2 Reasoning Mason has a rectangular garden that is $\frac{2}{3}$ yard wide by $\frac{7}{4}$ yards long. What is the area of Mason's garden? Use a drawing to show your work.



$A = l \times w$

$A = \frac{7}{4}\text{ yd} \times \frac{2}{3}\text{ yd} = \frac{14}{12} = 1\frac{2}{12}$

$\frac{2}{12} \div 2 = \frac{1}{6}\text{ yds}^2$

Name

Guided Practice

Do You Understand?

1. If you do not remember the formula for finding the area of a rectangle, how can you find its area?

Area Model

2. MP.6 Be Precise How could you define area?

Area is the number of square units that cover a specific shape.

Do You Know How?

3. Find the area of a rectangle with side lengths $\frac{2}{3}$ foot and $\frac{1}{2}$ foot.

$A = \frac{2}{3}\text{ ft} \times \frac{1}{2}\text{ ft} = \frac{2}{6} \div 2 = \frac{1}{3}\text{ ft}^2$

4. Find the area of a square with side lengths of $\frac{5}{4}$ inches.

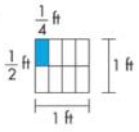
$A = l \times w$

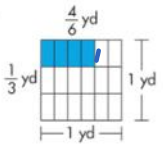
$A = \frac{5}{4} \times \frac{5}{4} = \frac{25}{16} = 1\frac{9}{16}\text{ in}^2$

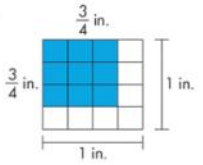
Complete # 9, 12, 18, & 21

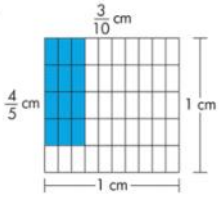
Independent Practice

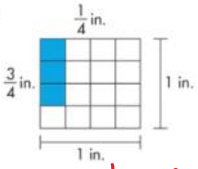
In **5–10**, find each area.

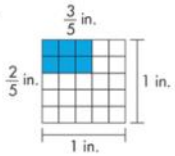
5. 

6. 

7. 

8. 

9. 

10. 

$\frac{1}{4}$ in $\times \frac{3}{4}$ in $= \frac{3}{16}$ in^2

11. Find the area of a rectangle with side lengths $\frac{5}{3}$ feet and $\frac{3}{4}$ foot.

12. Find the area of a square with side lengths of $\frac{3}{8}$ inch.

$A = l \times w$

$A = \frac{3}{8}$ in $\times \frac{3}{8}$ in $= \frac{9}{64}$

$A = \frac{9}{64}$ in^2

13. Find the area of a rectangle with side lengths $\frac{7}{2}$ centimeters and $\frac{5}{4}$ centimeters.

*For another example, see Set E on page 514.

Math Practices and Problem Solving

14. **MP.3 Construct Arguments** Roy and Tom are working on a multiplication problem. Roy claims that $\frac{7}{4} \times \frac{3}{8} = \frac{21}{32}$. Tom claims that the correct answer is $\frac{21}{8}$. Who is correct? Explain your answer.

15. Emilio needs to know how much area to clear for his son's square sandbox. Each side of the sandbox is $\frac{3}{4}$ yard. Find the area that the sandbox will cover.

16. **MP.1 Make Sense and Persevere** Margaret purchased a doormat measuring $\frac{1}{2}$ yard by $\frac{2}{3}$ yard for her back door step. If the step is $\frac{1}{4}$ square yard, will the mat fit? Explain.

17. Each person on a Ferris wheel pays $6.50 for a ticket. There are 72 passengers. How much money is collected from all the passengers?

18. **Higher Order Thinking** Kim is installing blue and white tile in her bathroom. She made a diagram of the layout showing the area of both colors. Write two expressions that describe the area of the blue tile.

19. Wilhelmina has 8.3 ounces of peanut butter. If she makes 5 sandwiches with an equal amount of peanut butter on each, how much peanut butter does she put on each one?

20. Irene buys a talking doll for $10.66 and some batteries for $4.22. She pays with a $20 bill. Estimate how much change she should get, to the nearest dime.

Common Core Assessment

21. Juno calculated the area of a square to be $\frac{4}{9}$ square yard. Which shows the side length of the square?

Ⓐ $\frac{2}{9}$ yard
Ⓑ $\frac{4}{9}$ yard
Ⓒ $\frac{2}{3}$ yard
Ⓓ $\frac{8}{9}$ yard

22. Bo calculated the area of a square to be $\frac{25}{4}$ square inches. Which shows the side length of the square?

Ⓐ $\frac{25}{2}$ inches
Ⓑ $\frac{25}{8}$ inches
Ⓒ $\frac{5}{2}$ inches
Ⓓ $\frac{5}{4}$ inches

$A = l \times w$
$\frac{4}{9}\text{ yds}^2 = l \times w$
$\frac{4}{9}\text{ yds}^2 = \frac{2}{3}\text{ yd} \times \frac{2}{3}\text{ yd}$

$\frac{4}{6} \times \frac{4}{6}$
$\frac{2}{3} \times \frac{2}{3}$
$\frac{8}{12} \times \frac{8}{12}$

$\frac{4}{6} \div 2 = \frac{2}{3}$
$\frac{4 \times 2}{6 \times 2} = \frac{8}{12}$