Unit 2, Lesson 15

Multiply More Fractions

Let's multiply mixed numbers.

Warm-up

Number Talk: Multiply Mixed Numbers

Find the value of each expression mentally.

- $6 \times \frac{3}{8}$
- $6 \times 2\frac{3}{8}$
- $7 \times \frac{9}{10}$
- $7 \times 3\frac{9}{10}$

Activity 1

Multiply Your Way

Write 1 number from the list in each blank so the situations make sense. Each number can be used only once.

4	5	$5\frac{1}{2}$	3	$5\frac{3}{4}$

1. The area of a rectangular rug is $16\frac{1}{2}$ square feet. The length of the rug is _____ feet.

   The width of the rug is _____ feet.

2. A rectangular puzzle is $2\frac{1}{2}$ feet wide. It is _____ feet long. It has an area of _____ square feet.

3. The area of a rectangular whiteboard is 23 square feet. The length of the whiteboard is _____ feet. The width of the whiteboard is _____ feet.

Share your work with your partner. Explain what choices you made and why.

Activity 2

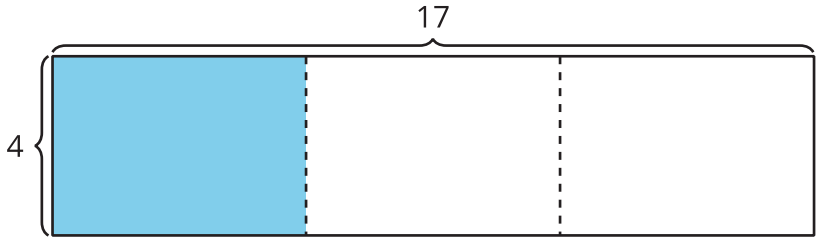
Equivalent Expressions

Each diagram represents a way to calculate $4 \times 5\frac{2}{3}$.
Each expression is equivalent to $4 \times 5\frac{2}{3}$.

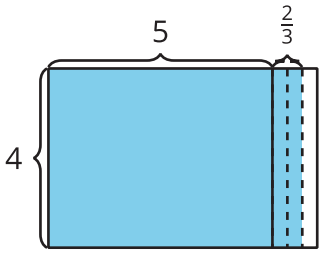
Match each diagram to an expression. Explain or show your reasoning.

1. $(4 \times 5) + \left(4 \times \frac{2}{3}\right)$
2. $(4 \times 6) - \left(4 \times \frac{1}{3}\right)$
3. $4 \times \frac{17}{3}$
4. $(4 \times 17) \div 3$

A



B



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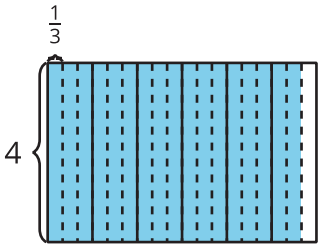

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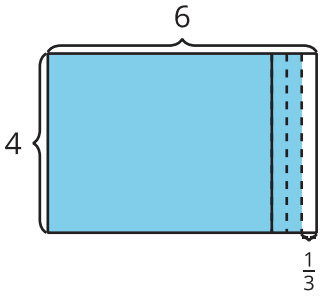
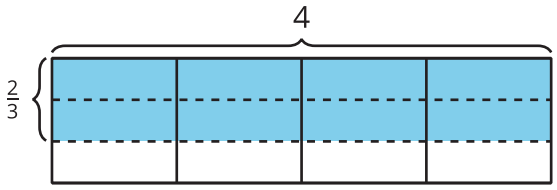


Choose your favorite diagram and expression to find the value of $4 \times 5\frac{2}{3}$. Be prepared to explain why it is your favorite.

Section C Summary

We learned how to find the area of a rectangle with a fractional side length.

Example: The shaded region has an area of $4 \times \frac{2}{3}$ because there are 4 groups of $\frac{2}{3}$ of a square unit shaded. The area is $\frac{8}{3}$ or $2\frac{2}{3}$ because there are 8 shaded parts and each one is $\frac{1}{3}$ of a square unit.



We also learned to multiply a mixed number by a whole number. We used diagrams and expressions to see why our strategies work.

Example: To multiply $3\frac{3}{4} \times 2$, we can use the expression $(3 \times 2) + (\frac{3}{4} \times 2)$. We can see both expressions represented by the shaded region in the diagram.

- The 2 rows of 3 and $\frac{3}{4}$ squares shaded show $3\frac{3}{4} \times 2$.
- The 2 rows of 3 squares shaded show $3 \times 2 = 6$.
- The 2 rows of $\frac{3}{4}$ of a square shaded show $\frac{3}{4} \times 2 = \frac{6}{4}$.
- The shaded region in the diagram represents the area of a rectangle with the dimensions of $3\frac{3}{4}$ units by 2 units.

So, the area of the shaded region is $6 + \frac{6}{4}$ or $7\frac{2}{4}$ square units.