

Lesson Objective: Use a model to multiply two mixed numbers and find the area of a rectangle.

Area and Mixed Numbers

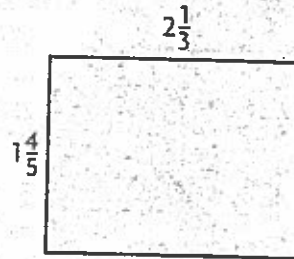
You can use an area model to help you multiply mixed numbers.

Find the area. $1\frac{4}{5} \times 2\frac{1}{3}$

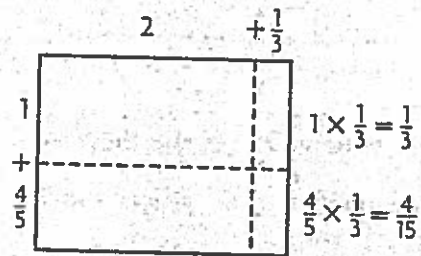
Step 1 Rewrite each mixed-number factor as the sum of a whole number and a fraction.

$$1\frac{4}{5} = 1 + \frac{4}{5} \text{ and } 2\frac{1}{3} = 2 + \frac{1}{3}$$

Step 2 Draw an area model to show the original multiplication problem.



Step 3 Draw dashed lines, and label each section to show how you broke apart the mixed numbers in Step 1.



Step 4 Find the area of each section.

$$1 \times 2 = \frac{2}{1}$$

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

$$\frac{4}{5} \times 2 = \frac{8}{5}$$

$$\frac{4}{5} \times \frac{1}{3} = \frac{4}{15}$$

Step 5 Add the areas of each of the sections to find the total area of the rectangle.

$$2 + \frac{1}{3} + \frac{8}{5} + \frac{4}{15} = \frac{30}{15} + \frac{5}{15} + \frac{24}{15} + \frac{4}{15}$$

$$= \frac{63}{15}, \text{ or } 4\frac{1}{5}$$

So, $1\frac{4}{5} \times 2\frac{1}{3}$ is $4\frac{1}{5}$.

Use an area model to solve.

1. $1\frac{2}{3} \times 2\frac{1}{4}$

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

3. $2\frac{1}{2} \times 1\frac{1}{3}$

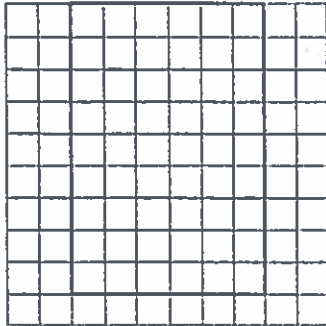
Name _____

Area and Mixed Numbers

Use the grid to find the area.

1. Let each square represent $\frac{1}{4}$ unit by $\frac{1}{4}$ unit.

$$2\frac{1}{4} \times 1\frac{1}{2} = \underline{3\frac{3}{8}}$$



54 squares cover the diagram.

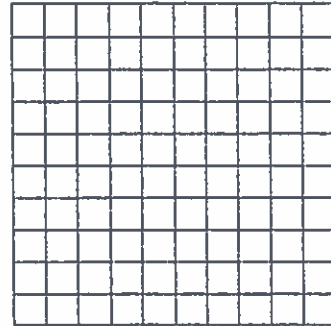
Each square is $\frac{1}{16}$ square unit.

The area of the diagram is

$$\underline{54 \times \frac{1}{16} = \frac{54}{16} = 3\frac{3}{8}} \text{ square units.}$$

2. Let each square represent $\frac{1}{3}$ unit by $\frac{1}{3}$ unit.

$$1\frac{2}{3} \times 2\frac{1}{3} = \underline{\hspace{2cm}}$$



The area is _____ square units.

Use an area model to solve.

3. $1\frac{1}{8} \times 2\frac{1}{2}$

4. $2\frac{2}{3} \times 1\frac{1}{3}$

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

Problem Solving



6. Ava's bedroom rug is $2\frac{3}{4}$ feet long and $2\frac{1}{2}$ feet wide. What is the area of the rug?

7. A painting is $2\frac{2}{3}$ feet long and $1\frac{1}{2}$ feet high. What is the area of the painting?