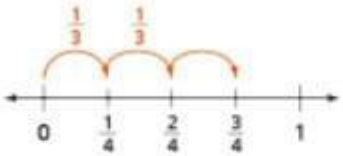
EXAMPLE 2 Multiply Fractions

Find $\frac{2}{3} \times \frac{3}{4}$ using a number line.

$\frac{1}{3}$ means 1 of 3 equal parts, so $\frac{1}{3}$ of $\frac{3}{4}$ is $\frac{1}{4}$.

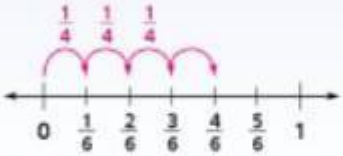
$\frac{2}{3}$ means 2 of 3 equal parts, so $\frac{2}{3}$ of $\frac{3}{4}$ is 2 times $\frac{1}{4}$.

$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$ or $\frac{1}{2}$



Try It!

Find $\frac{3}{4} \times \frac{4}{6}$ using the number line. Explain.



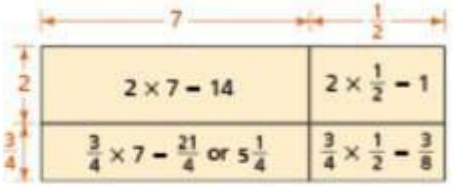
$\frac{1}{2}$; Sample answer: $\frac{1}{4}$ means 1 of 4 equal parts, so $\frac{1}{4}$ of $\frac{4}{6}$ is $\frac{1}{6}$. $\frac{2}{4}$ means 2 of 4 equal parts, so $\frac{2}{4}$ is 2 times $\frac{1}{6}$. $\frac{3}{4}$ means 3 of 4 equal parts, so $\frac{3}{4}$ is 3 times $\frac{1}{6}$; $\frac{3}{4} \times \frac{4}{6} = \frac{12}{24}$ or $\frac{1}{2}$.

EXAMPLE 3 Multiply Mixed Numbers

Find $7\frac{1}{2} \times 2\frac{3}{4}$.

Estimate first. $7\frac{1}{2}$ times $2\frac{3}{4}$ is about 8 times 3.
So, the answer should be about 24.

ONE WAY You can use an area model to find the partial products. Then add to find the final product.



$14 + 1 + 5\frac{1}{4} + \frac{3}{8} =$

$14 + 1 + 5\frac{2}{8} + \frac{3}{8} = 20\frac{5}{8}$

$5\frac{1}{4}$ is renamed $5\frac{2}{8}$.

ANOTHER WAY You can use an equation to find the product. Rename the mixed numbers and then multiply.

$$7\frac{1}{2} \times 2\frac{3}{4} = \frac{15}{2} \times \frac{11}{4}$$
$$= \frac{165}{8}$$
$$= 20\frac{5}{8}$$

Because $20\frac{5}{8}$ is close to the estimate of 24, the answer is reasonable.

Try It!

A clothing factory makes T-shirts. If each machine makes $3\frac{1}{3}$ T-shirts per hour, how many T-shirts does one machine make in $4\frac{1}{2}$ hours? Write and solve an equation.

15 T-shirts; Sample answer: $3\frac{1}{3} \times 4\frac{1}{2} = \frac{90}{6}$ or 15