

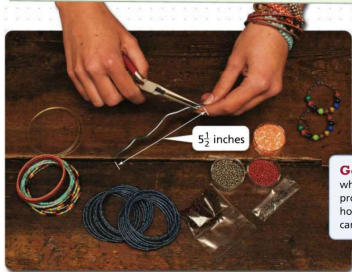
Lesson 1.6

**Lesson 1-6: Divide Mixed Numbers**

I can... divide with mixed numbers.

**Solve & Discuss It!**

A jeweler has a  $5\frac{1}{2}$ -inch strip of silver wire that she is cutting into  $\frac{3}{8}$ -inch pieces. How many pieces can she make?



**Generalize** How can you use what you know about solving problems with fractions to find how many pieces the jeweler can make?

$$5\frac{1}{2} \div \frac{3}{8}$$

$$\frac{11}{2} \div \frac{3}{8}$$

$$\frac{11}{2} \cdot \frac{8}{3} = 4\frac{4}{3}$$

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

mixed #  $\rightarrow$  improper Fraction

$$2\frac{3}{4} \rightarrow \frac{11}{4}$$

1. multiply denominator by whole number ( $4 \cdot 2 = 8$ )
2. Add the numerator ( $8 + 3 = 11$ )

$$3\frac{3}{7} = \frac{24}{7}$$

Explain how to use estimation to check whether your answer is reasonable.

$$6 \div 1.5 = 4$$

$$\div 1 = 4$$

### Example 1: Divide a Mixed Number by a Mixed Number

Damon has  $37\frac{1}{2}$  inches of space on his car bumper that he wants to use for bumper stickers. How many short bumper stickers can Damon fit side by side on his car bumper?



1) Improper Fraction  $37\frac{1}{2} \div 6\frac{1}{4}$

2) KCF  $\frac{75}{2} \div \frac{25}{4}$

$3\cancel{7}5 \cdot \frac{4}{2} = \frac{42}{1} = 6 \text{ stickers}$

Try it!

How many medium bumper stickers can Damon fit side by side on his car bumper?

Find  $37\frac{1}{2} \div 10\frac{3}{4}$

$\frac{75}{2} \div \frac{43}{4} = \frac{75}{2} \cdot \frac{4}{43} = \frac{150}{43}$   
 $43 \overline{)150} \begin{array}{r} 3 \\ -129 \\ \hline 21 \end{array}$

Convince Me!

Why do you multiply  $\frac{75}{2}$  by  $\frac{4}{43}$  to divide  $37\frac{1}{2} \div 10\frac{3}{4}$ ?

$3\cancel{2}1 \overline{)43}$

3 bumper stickers

improper then KCF.

### Example 2: Divide a Whole Number by a Mixed Number

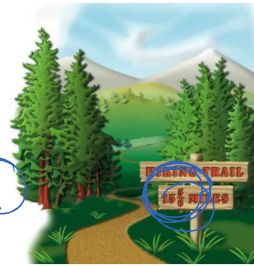
Kayla drives her new car to work every day. It uses  $1\frac{2}{5}$  gallons of gas for each round trip. How many round trips to work can Kayla drive on a full tank of gas?



$16 \div 1\frac{2}{5}$   
 $\frac{16}{1} \div \frac{7}{5}$   
 $2\cancel{1}6 \cdot \frac{5}{7} = \frac{10}{1}$   
 10 round trips

### Example 3: Divide a Mixed Number by a Whole Number

Lillian hikes the trail in 4 hours. She hikes the same number of miles per hour. How many miles did Lillian hike each hour?



$15\frac{5}{6} \div 4$   
 $\frac{95}{6} \div \frac{4}{1}$   
 $\frac{95}{6} \cdot \frac{1}{4} = \frac{95}{24}$

$24 \overline{)95} \begin{array}{r} 3 \\ -72 \\ \hline 23 \end{array}$   
 $3\frac{23}{24}$  miles

Try it! Pick one. Divide.

a)  $20 \div 2\frac{2}{3}$

b)  $12\frac{1}{2} \div 6$

$\frac{20}{1} \div \frac{8}{3}$   
 $5\cancel{0} \cdot \frac{3}{8} = \frac{15}{8}$   
 $1\frac{7}{8}$

$\frac{25}{2} \div \frac{6}{1}$   
 $\frac{25}{2} \cdot \frac{1}{6} = \frac{25}{12} = 2\frac{1}{12}$

#### KEY CONCEPT

To divide with mixed numbers, write mixed numbers and any whole numbers as fractions.

Use the reciprocal of the divisor to rewrite the problem as a multiplication problem.

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$$5\frac{1}{2} \div 1\frac{1}{3} = \frac{15}{2} \div \frac{4}{3} = \frac{15}{2} \times \frac{3}{4} = \frac{45}{8} = 5\frac{5}{8} \text{ or } 4$$

Finally, multiply and use the estimate to check whether the answer is reasonable.

Use compatible numbers to estimate.  
 $5 + 1 = 5$

**Do you understand?**

1) How can you divide with mixed numbers?  
*improper fraction  
k e f*

2) What is the difference between dividing fractions less than 1 and dividing mixed numbers?  
*Mixed # → improper fraction*

Rate your understanding. 1-Do not understand....4-can teach someone else

| Learning Target: Dividing mixed numbers       |   |   |   |   |
|---|---|---|---|---|
| I can divide mixed numbers by mixed numbers.  | 1 | 2 | 3 | 4 |
| I can divide mixed numbers and whole numbers. | 1 | 2 | 3 | 4 |