

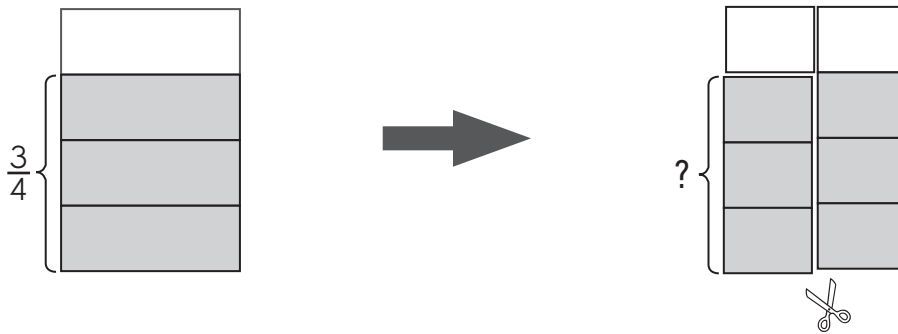
Chapter 4

Multiplying and Dividing Fractions and Mixed Numbers

Practice 1 Multiplying Proper Fractions

Complete.

1.



$$\frac{1}{2} \text{ of } \frac{3}{4} = \frac{\square}{\square} \times \frac{\square}{\square}$$

$$= \frac{\square}{\square}$$

Multiply. Express the product in simplest form.

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

3. $\frac{5}{12} \times \frac{7}{8} =$

Multiply. Express the product in simplest form.

4. $\frac{2}{11} \times \frac{7}{12} =$

5. $\frac{3}{8} \times \frac{4}{9} =$

Complete. Express the product in simplest form.

6. $\frac{1}{3}$ of $\frac{5}{8} = \frac{\square}{\square} \times \frac{\square}{\square}$
 $= \frac{\square}{\square}$

7. $\frac{2}{7}$ of $\frac{9}{11} = \frac{\square}{\square} \times \frac{\square}{\square}$
 $= \frac{\square}{\square}$

8. $\frac{2}{5}$ of $\frac{7}{10} = \frac{\square}{\square} \times \frac{\square}{\square}$
 $= \frac{1}{\square} \times \frac{\square}{\square}$
 $= \frac{1 \times \square}{\square \times \square}$
 $= \frac{\square}{\square}$

9. $\frac{3}{4}$ of $\frac{8}{9} = \frac{\square}{\square} \times \frac{\square}{\square}$
 $= \frac{1}{\square} \times \frac{\square}{\square}$
 $= \frac{1}{1} \times \frac{\square}{\square}$
 $= \frac{\square}{\square}$

Practice 2 Real-World Problems: Multiplying with Proper Fractions

Solve. Draw models to help you.

1. Lena has some eggs. She uses $\frac{3}{5}$ of the eggs to make waffles and scrambled eggs. She uses $\frac{2}{3}$ of the eggs she took to make waffles.

What fraction of the total number of eggs does Lena use to make waffles?

2. Dawn has $\frac{5}{6}$ yard of lace. She uses $\frac{4}{5}$ of it for a dress and the rest for a jewel box. How much lace does she use for the jewel box?

Solve. Show your work.

- 3.** Tasha finished a job in $\frac{3}{4}$ hour. Megan finished it in $\frac{4}{5}$ of the time Tasha took. How long did Megan take to finish the job?
- 4.** Lily has a bottle containing $\frac{7}{8}$ quart of milk. She pours $\frac{4}{5}$ of it into a bowl. What amount of milk does she pour into the bowl?
- 5.** Raul ran $\frac{3}{4}$ mile in a race. Eduardo ran $\frac{2}{7}$ of the distance that Raul ran. What distance did Eduardo run?

Name: _____

Date: _____

Solve. Draw models to help you.

6. Jenny spends $\frac{1}{6}$ of her paycheck and saves $\frac{2}{5}$ of the remaining amount.
What fraction of her total paycheck is saved?

Solve. Draw models to help you.

7. In Rod's family, $\frac{3}{4}$ of the members wear glasses. Of those who do not wear glasses, $\frac{1}{3}$ are male. What fraction of the family are males who do not wear glasses?

Name: _____

Date: _____

Solve. Draw models to help you.

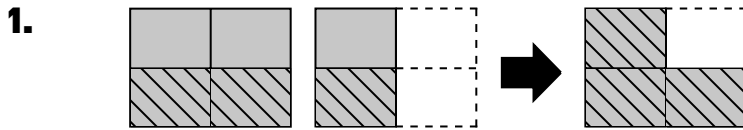
8. Ned folded a set of origami figures. Of this set, $\frac{5}{8}$ are cranes and $\frac{1}{6}$ of the remainder are frogs. The rest are grasshoppers. What fraction of the origami figures are grasshoppers?

Solve. Show your work.

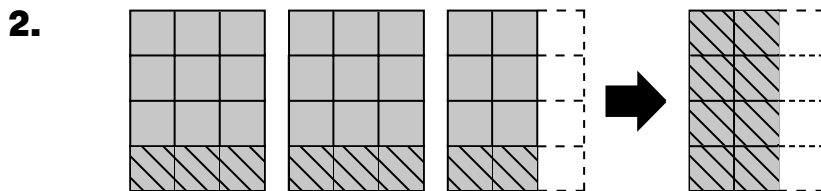
- 9.** In a garden, $\frac{2}{3}$ of the flowers are roses. Of the roses in the garden, $\frac{5}{12}$ are yellow and the rest are red. What fraction of the flowers are red roses?
- 10.** Karen collects local and foreign coins. Of the coins in her collection, $\frac{1}{4}$ are foreign coins. Of the foreign coins, $\frac{2}{5}$ are from Mexico. What fraction of the collection are foreign coins that are not from Mexico?

Practice 3 Multiplying Improper Fractions by Fractions by Fractions

Complete.

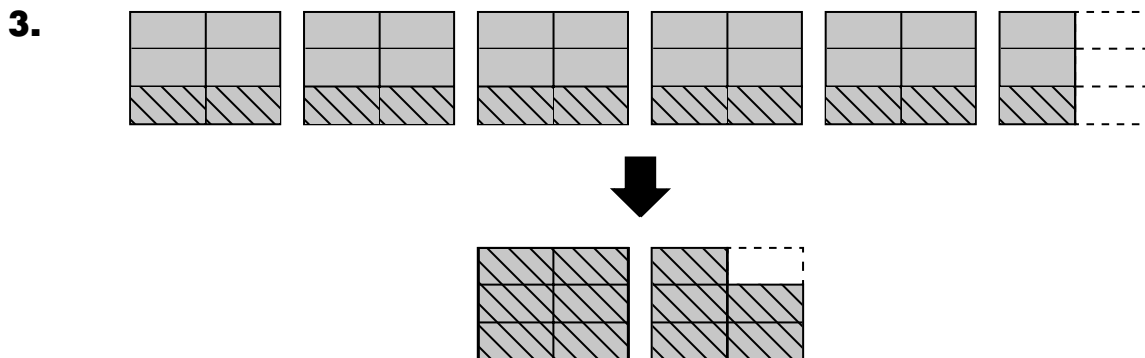


$$\frac{3}{2} \times \frac{1}{2} = \frac{\boxed{}}{\boxed{}}$$



$$\frac{8}{3} \times \frac{1}{4} = \frac{\boxed{}}{\boxed{}}$$

Find the product.



$$\frac{11}{2} \times \frac{1}{3} = \frac{\boxed{}}{\boxed{}}$$

Multiply. Express the product in simplest form.

Example

$$\frac{4}{5} \times \frac{7}{6}$$

Method 1

$$\begin{aligned}\frac{4}{5} \times \frac{7}{6} &= \frac{4 \div 2}{5} \times \frac{7}{6 \div 2} \\ &= \frac{2}{5} \times \frac{7}{3} \\ &= \frac{2 \times 7}{5 \times 3} \\ &= \frac{14}{15}\end{aligned}$$

Method 2

$$\begin{aligned}\frac{4}{5} \times \frac{7}{6} &= \frac{4 \times 7}{5 \times 6} \\ &= \frac{28}{30} \\ &= \frac{28 \div 2}{30 \div 2} \\ &= \frac{14}{15}\end{aligned}$$

4. $\frac{7}{4} \times \frac{1}{3} =$

5. $\frac{9}{8} \times \frac{2}{7} =$

6. $\frac{8}{3} \times \frac{3}{10} =$

7. $\frac{15}{9} \times \frac{3}{20} =$

Multiply. Express the product as a whole number or a mixed number in simplest form.

Example

$$\frac{2}{5} \times \frac{15}{4}$$

Method 1

$$\begin{aligned} \frac{2}{5} \times \frac{15}{4} &= \frac{2 \div 2}{5} \times \frac{15}{4 \div 2} \\ &= \frac{1}{5 \div 5} \times \frac{15 \div 5}{2} \\ &= \frac{1 \times 3}{1 \times 2} \\ &= 1\frac{1}{2} \end{aligned}$$

Method 2

$$\begin{aligned} \frac{2}{5} \times \frac{15}{4} &= \frac{2 \times 15}{5 \times 4} \\ &= \frac{30}{20} \\ &= \frac{3}{2} \\ &= 1\frac{1}{2} \end{aligned}$$

8. $\frac{3}{4} \times \frac{8}{6} =$

9. $\frac{16}{7} \times \frac{21}{2} =$

10. $\frac{15}{12} \times \frac{8}{5} =$

11. $\frac{32}{9} \times \frac{36}{8} =$

Multiply. Express the product as a whole number or a mixed number in simplest form.

12. $\frac{7}{8} \times \frac{6}{5} =$

13. $\frac{11}{12} \times \frac{28}{3} =$

14. $\frac{21}{5} \times \frac{15}{6} =$

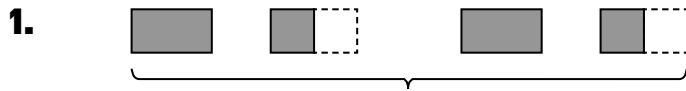
15. $\frac{25}{4} \times \frac{18}{10} =$

16. $\frac{30}{9} \times \frac{7}{2} =$

17. $\frac{14}{8} \times \frac{5}{3} =$

Practice 4 Multiplying Mixed Numbers and Whole Numbers

Complete.

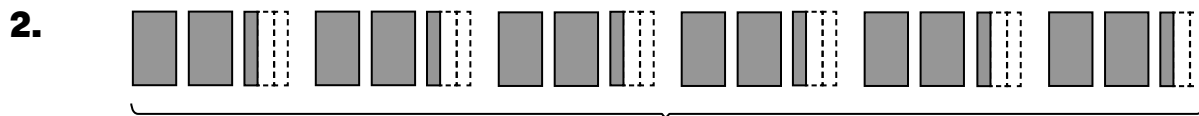


$$1\frac{1}{2} \times 2$$

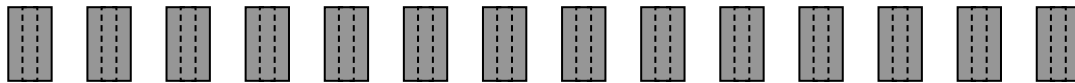


$$1\frac{1}{2} \times 2 = \frac{\boxed{}}{\boxed{}} \times \boxed{}$$

$$= \boxed{}$$



$$2\frac{1}{3} \times 6$$



$$2\frac{1}{3} \times 6 = \frac{\boxed{}}{\boxed{}} \times \boxed{}$$

$$= \boxed{}$$

Multiply. Express the product as a whole number or a mixed number in simplest form.

Example

$$9 \times 2\frac{1}{3}$$

$$9 \times 2\frac{1}{3} = 9 \times \frac{7}{3}$$

$$= \frac{9 \times 7}{3}$$

$$= \frac{63}{3}$$

$$= 21$$

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

4. $2\frac{3}{7} \times 28 =$

5. $24 \times 1\frac{5}{6} =$

6. $4\frac{1}{2} \times 18 =$

Multiply. Express the product as a whole number or a mixed number in simplest form.

7. $2\frac{3}{4} \times 16 =$

8. $32 \times 3\frac{1}{8} =$

Multiply. Express the product as a whole number or a mixed number in simplest form.

Example

$$6 \times 2\frac{1}{5}$$

$$6 \times 2\frac{1}{5} = 6 \times \frac{11}{5}$$

$$= \frac{66}{5}$$

$$= \frac{65}{5} + \frac{1}{5}$$

$$= 13 + \frac{1}{5}$$

$$= 13\frac{1}{5}$$

9. $4 \times 2\frac{7}{9} =$

10. $5 \times 2\frac{3}{7} =$

Multiply. Express the product as a whole number or a mixed number in simplest form.

11. $2\frac{1}{4} \times 7 =$

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

13. $1\frac{4}{5} \times 12 =$

14. $12 \times 2\frac{3}{8} =$

15. $21 \times 2\frac{5}{9} =$

16. $26 \times 1\frac{1}{6} =$

Practice 5 Real-World Problems: Multiplying Mixed Numbers

Solve. Show your work.

- 1.** At a party, there are 8 guests. Each guest eats $2\frac{1}{4}$ oranges.
How many oranges do the 8 guests eat?

$$1 \text{ guest} \longrightarrow 2\frac{1}{4} \text{ oranges}$$

$$8 \text{ guests} \longrightarrow \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \text{ oranges}$$
$$= \underline{\hspace{2cm}}$$

The 8 guests eat a total of _____ oranges.

- 2.** One pound of chicken costs \$3. Jim buys $8\frac{2}{3}$ pounds of chicken.
How much does Jim pay for the chicken?

- 3.** The length of a picture is 2 yards and its width is $1\frac{2}{5}$ yards. Find the area of the picture. Express your answer as a decimal.

Solve. Show your work.

- 4.** Sue buys 5 pieces of fabric. Each piece of fabric is $1\frac{7}{10}$ yards long.
- a.** What is the total length of the fabric she buys?

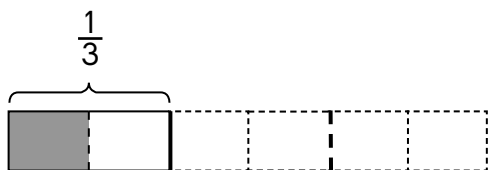
 - b.** One yard of the fabric costs \$5. How much does she pay for all 5 pieces of fabric?
- 5.** Angela works $1\frac{1}{2}$ hours a day and is paid \$7 per hour. She works 5 days a week. How much does Angela earn in 7 weeks?

Practice 6 Dividing a Fraction by a Whole Number

Shade parts of the model to show the division expression. Then complete.

Example

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



$\frac{1}{6}$ is shaded.

$$\frac{1}{3} \div 2 = \underline{\frac{1}{6}}$$

1. $\frac{1}{6} \div 3$



$\frac{\quad}{\quad}$ is shaded.

$$\frac{1}{6} \div 3 = \underline{\hspace{2cm}}$$

Divide. Draw models to help you.

2. $\frac{4}{5} \div 2 =$

3. $\frac{6}{7} \div 3 =$

4. $\frac{3}{4} \div 2 =$

5. $\frac{2}{5} \div 3 =$

Divide. Express each quotient in simplest form.

6. $\frac{4}{5} \div 7 =$

7. $\frac{5}{8} \div 9 =$

8. $\frac{8}{9} \div 4 =$

9. $\frac{10}{11} \div 5 =$

Name: _____

Date: _____

Solve. Show your work.

10. Mr. Chagall's garden covers $\frac{2}{5}$ of an acre of land. He divides the land into 4 equal sections. What fraction of an acre is each section of the garden?

- 11.** Gordon pours $\frac{4}{9}$ quart of milk from a pitcher equally into 4 mugs.
- a.** Find the amount of milk in each mug.
 - b.** Find the amount of milk in 3 mugs.

Solve. Show your work.

- 12.** Calvin buys $\frac{3}{5}$ pound of ground beef. He divides the beef into 6 equal portions.
- a.** Find the weight of 1 portion of beef.
 - b.** Find the weight of 4 portions of beef.
-
- 13.** Devon buys a plot of land with an area of $\frac{5}{6}$ square kilometer. He divides the land equally into 4 smaller plots. What is the total area of 3 of the smaller plots of land?

Practice 7 Real-World Problems: Multiplying and Dividing with Fractions

Solve. Draw models to help you.

1. Evan typed 72 pages of notes one day. He typed $\frac{1}{2}$ of the pages in the morning and $\frac{1}{3}$ of the pages in the afternoon. He typed the rest of the pages in the evening. How many pages of notes did he type in the morning and afternoon?

2. Last Saturday, Jay spent 6 hours playing games, studying and talking with his friends. He spent $\frac{2}{5}$ of the time playing games and $\frac{1}{2}$ of the time studying. How many minutes did he spend talking with his friends?

Solve. Draw models to help you.

- 3.** Joanne earns \$720 a week. She spends $\frac{1}{3}$ of her money on groceries and household goods and $\frac{3}{4}$ of the remaining money on rent. How much money does she spend on rent, groceries and household goods?

Name: _____

Date: _____

4. During a triathlon, Sharon swims $\frac{1}{4}$ of the total route and cycles $\frac{3}{5}$ of the remaining route. She runs the rest of the route. If she runs 3,600 meters, find the total distance of the triathlon route.

Solve. Show your work.

- 5.** Victoria has a 2-pound package of flour. She uses $\frac{2}{5}$ of the flour to make a pizza. She then uses $\frac{3}{10}$ of the remaining flour to make bread. Find the weight of the package of flour that she has left. Express your answer as a decimal.


Name: _____

Date: _____

Solve. Show your work.

6. Karen collects $\frac{6}{7}$ quart of rainwater. She uses $\frac{1}{2}$ of the water to clean her bicycle and uses the remaining water equally for 3 houseplants. What volume of water does she use for each houseplant?

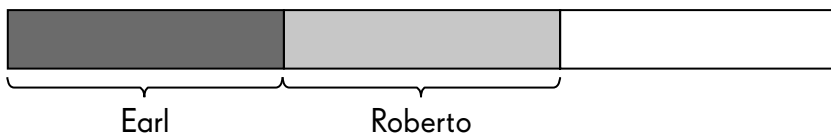
7. Ricardo spends $\frac{8}{9}$ hour reading the newspaper. He spends $\frac{1}{4}$ of the time reading the world news and splits the remaining time equally between the sports news and the comics. How much time does he spend reading the comics?



Math Journal

Rachel drew a model to solve this problem:

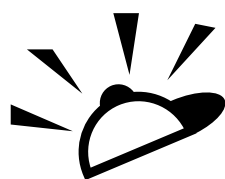
Earl pours $\frac{1}{3}$ of a bottle of juice into his glass. Roberto pours $\frac{1}{3}$ of the remainder into his glass. What fraction of the bottle of juice is left?



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

$\frac{1}{3}$ of the bottle of juice is left.

Did Rachel solve the problem correctly? Explain.

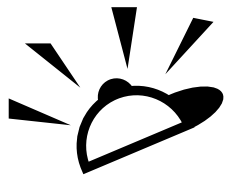


Put On Your Thinking Cap!



Challenging Practice

An art teacher has a box of markers. She keeps half of the markers in the box and gives $\frac{1}{3}$ of the other half to group A. The remaining markers were shared equally among the 8 students in group B. What fraction of the whole box does each of the students in group B get?



Put On Your Thinking Cap!



Problem Solving

Mimi's Market sold 24 heads of lettuce one morning. That afternoon $\frac{2}{7}$ of the remaining heads of lettuce were sold. The number of heads left was now $\frac{1}{2}$ of the number the market had at the beginning of the day. How many heads of lettuce were there at the beginning of the day?