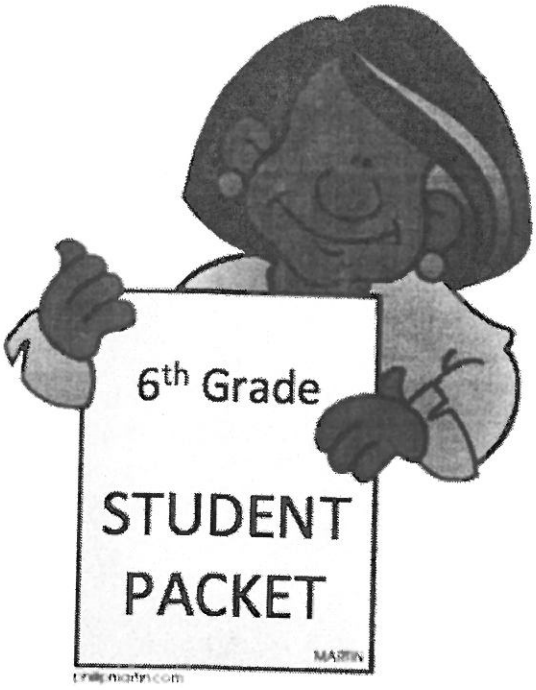
# 6th Grade Intensive Math



Name _____ Date _____ Class _____

LESSON 3-3

# Practice A

## *Adding and Subtracting Decimals*

**Find each sum or difference.**

1. 1.5 + 2.3 _____
2. 6.5 + 1.4 _____
3. 8.9 – 5.1 _____
4. 12.6 – 3.4 _____
5. 8.16 – 7.02 _____
6. 7.25 + 8.75 _____
7. 11.4 + 8.6 _____
8. 16.5 – 4.3 _____
9. 9.55 – 1.2 _____
10. 25.6 + 5.1 _____
11. 8.9 + 3.05 _____
12. 10.64 – 8.5 _____

**Circle the letter of the correct answer.**

13. If $x = 2.3$, what is the value of the expression $5.4 + x$?

    A 3.1 C 7.1

    B 7.7 D 3.7

14. If $a = 4.2$, what is the value of the expression $8.7 - a$?

    F 12.9 H 4.5

    G 4.9 I 12.5

15. If $m = 1.9$, what is the value of the expression $m + 4.2$?

    A 2.3 C 6.1

    B 2.2 D 7.1

16. If $y = 5.9$, what is the value of the expression $7.2 - y$?

    F 1.3 H 13.3

    G 1.7 I 13.1

17. Marcus is 1.5 meters tall. His sister, Carol, is 0.1 meter taller than Marcus. Their father is 0.2 meter taller than Carol. How tall is Carol? How tall is their father?

    _____

18. Jennifer brought $14.75 to the baseball game. She spent $3.45 for a hot dog and soda. How much money does she have left?

    _____

Name _____ Date _____ Class _____

LESSON 3-3

# Reading Strategies

## *Use an Organizer*

Writing decimals in a place-value grid helps you line up decimal points to add or subtract decimals.

| | Ones | Tenths | Hundredths |
|---|---|---|---|
| | 1 | 4 | 0 |
| | 5 | 3 | 8 |
| + | 2 | 7 | 0 |
| | 9 | 4 | 8 |

1.40
5.38
+2.70
9.48

Add zeros as place holders.

Place decimal point in answer.

28.05
−6.30
21.75

| | Tens | Ones | Tenths | Hundredths |
|---|---|---|---|---|
| | 2 | 8 | 0 | 5 |
| − | | 6 | 3 | 0 |
| | 2 | 1 | 7 | 5 |

1. How does the place-value grid help you add or subtract?

_____

2. Place these numbers on the place-value grid below: 3.25, 1.06, 2.9.

| | Ones | Tenths | Hundredths |
|---|---|---|---|
| | | | |
| | | | |
| + | | | |
| | | | |

3. Place this problem on the place-value grid below: 23.82 – 7.2.

| | Tens | Ones | Tenths | Hundredths |
|---|---|---|---|---|
| | | | | |
| − | | | | |
| | | | | |

4. Add the numbers on the place-value grid. What is the sum?

_____

_____

5. Subtract the numbers on the place-value grid. What is the difference?

_____

_____

6. For which numbers did you add zero as a place holder?

_____

Name _____ Date _____ Class _____

LESSON 3-3

# Review for Mastery

## *Adding and Subtracting Decimals*

You can use a place-value chart to help you add and subtract decimals.

Add 1.4 and 0.9.

| | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|
| + | | 1 | 4 | | |
| | | 0 | 9 | | |

So, 1.4 + 0.9 = 2.3.

Subtract 2.4 from 3.1.

| | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|
| − | | 3 | 1 | | |
| | | 2 | 4 | | |

So, 3.1 − 2.4 = 0.7.

**Find each sum or difference.**

1.

| | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|
| + | | 2 | 6 | | |
| | | 1 | 1 | 5 | |

_____

2.

| | Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|---|
| − | | 2 | 5 | 3 | |
| | | 1 | 7 | | |

_____

3. 4.3 + 1.4

| Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|
| | | | | |
| | | | | |

_____

4. 14.4 − 3.8

| Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|
| | | | | |
| | | | | |

_____

5. 7.3 + 8.5

| Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|
| | | | | |
| | | | | |

_____

6. 12.34 − 6.9

| Tens | Ones | Tenths | Hundredths | Thousandths |
|---|---|---|---|---|
| | | | | |
| | | | | |

_____

7. 6.3 − 2.5

_____

8. 20.65 + 13.24

_____

9. 8.9 − 1.95

_____

10. 3.42 + 5.25

_____

Name _____ Date _____ Class _____

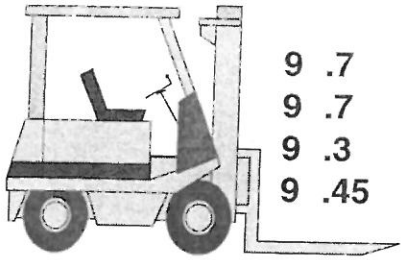
LESSON 3-3 **Student Worksheet**

## *Adding and Subtracting Decimals*

### Problem 1

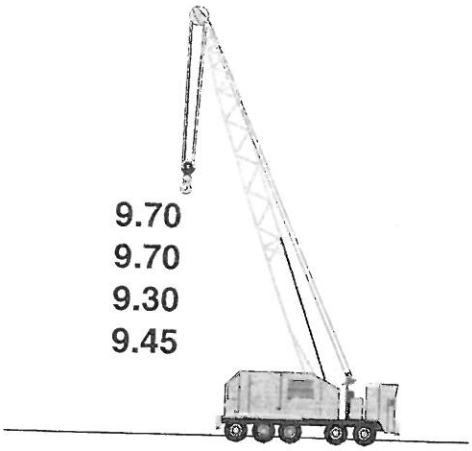
How do I add decimals?

**Step 1: Align the decimal points.**



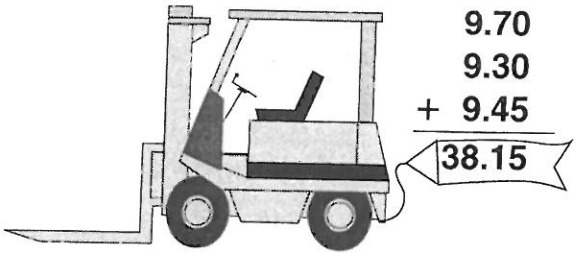
9 .7
9 .7
9 .3
9 .45

**Step 2: Add zeros as placeholders.**



9.70
9.70
9.30
9.45

**Step 3: Add one place at a time. Then write the decimal.**



9.70
9.70
9.30
+ 9.45
38.15

**Estimate to check.**

10 ✓
10 ✓
9 ✓
9 ✓
38

38 is close to 38.15.

### Think and Discuss

1. How do you know that your answer to Problem 1 is reasonable?

2. In Step 2 when you added the zeros, did the values of the decimals change? Explain.

Name _____ Date _____ Class _____

LESSON 3-4

# Practice A

## *Multiplying Decimals*

**Find each product.**

1. $\begin{array}{r} 0.4 \\ \times\ 0.2 \\ \hline \end{array}$ _____

2. $\begin{array}{r} 0.3 \\ \times\ 0.4 \\ \hline \end{array}$ _____

3. $\begin{array}{r} 1.2 \\ \times\ 0.5 \\ \hline \end{array}$ _____

4. $\begin{array}{r} 1.1 \\ \times\ 0.9 \\ \hline \end{array}$ _____

5. $\begin{array}{r} 2.5 \\ \times\ 0.5 \\ \hline \end{array}$ _____

6. $\begin{array}{r} 6.0 \\ \times\ 0.7 \\ \hline \end{array}$ _____

7. $0.4 \cdot 0.5$ _____

8. $1.2 \cdot 1.5$ _____

9. $1.7 \cdot 0.3$ _____

10. $6.7 \cdot 0.4$ _____

11. $9.6 \cdot 0.2$ _____

12. $0.8 \cdot 0.8$ _____

**Evaluate $2x$ for each value of $x$.**

13. $x = 0.1$ _____

14. $x = 0.5$ _____

15. $x = 0.9$ _____

16. $x = 1.2$ _____

17. $x = 1.7$ _____

18. $x = 2.4$ _____

19. Each box can hold 2.5 pounds of apples. How many pounds can 3 boxes hold?

_____

20. Each pie costs $5.60. How much will it cost to buy 2 pies?

_____

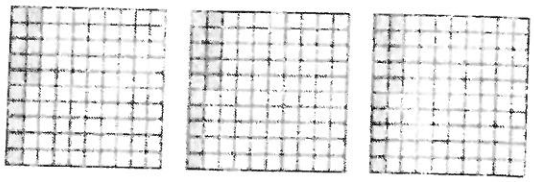
Name _____ Date _____ Class _____

LESSON 3-4

# Reading Strategies

## *Use a Visual Tool*

Each grid shows 0.15 shaded.

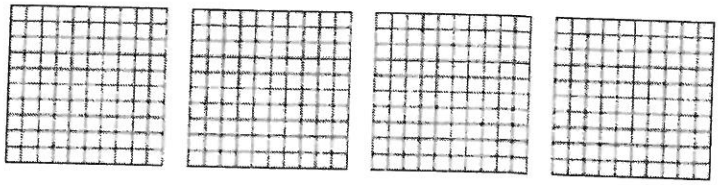


You can add the decimals to find how much of the grids are shaded. → $0.15 + 0.15 + 0.15 = 0.45$

You can multiply 0.15 by 3. →

$$\begin{array}{r} {\scriptstyle 1} \\ 0.15 \\ \times \quad 3 \\ \hline 0.45 \end{array}$$

**Use these grids to complete the problems below.**



1. Shade 0.23 in each of the 4 grids.
2. Write an addition problem for the shaded grids.

_____

3. Find the sum of your addition problem.

_____

4. Write a multiplication problem for your shaded picture.

_____

5. Find the product of your multiplication problem.

_____

Name _____ Date _____ Class _____

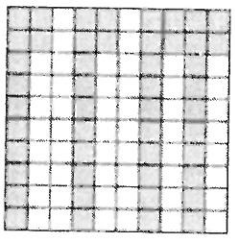
LESSON 3-4

# Review for Mastery

## *Multiplying Decimals*

You can use a model to help you multiply a decimal by a whole number.

Find the product of 0.12 and 4, using a 10 by 10 grid.



Shade 4 groups of 12 squares. Count the number of shaded squares. Since you have shaded 48 of the 100 squares, $0.12 \cdot 4 = 0.48$.

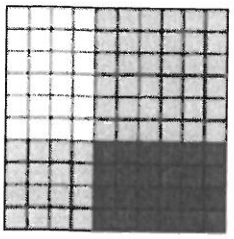
**Find each product.**

1. $0.23 \cdot 3$ _____
2. $0.41 \cdot 2$ _____
3. $0.011 \cdot 5$ _____
4. $0.32 \cdot 2$ _____
5. $0.15 \cdot 3$ _____
6. $0.42 \cdot 2$ _____
7. $0.04 \cdot 8$ _____
8. $0.22 \cdot 4$ _____

You can also use a model to help you multiply a decimal by a decimal.

Find the product of 0.4 and 0.6.

$0.4 \cdot 0.6 = 0.24$



**Find each product.**

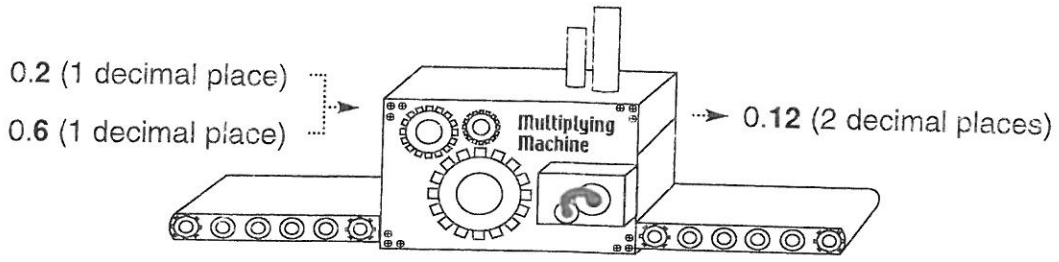
9. $0.2 \cdot 0.8$ _____
10. $0.7 \cdot 0.9$ _____
11. $0.5 \cdot 0.5$ _____
12. $0.3 \cdot 0.6$ _____
13. $0.5 \cdot 0.2$ _____
14. $0.4 \cdot 0.4$ _____
15. $0.1 \cdot 0.9$ _____
16. $0.4 \cdot 0.7$ _____

Name _____ Date _____ Class _____

LESSON 3-4 **Student Worksheet**
*Multiplying Decimals*

## Problem 1

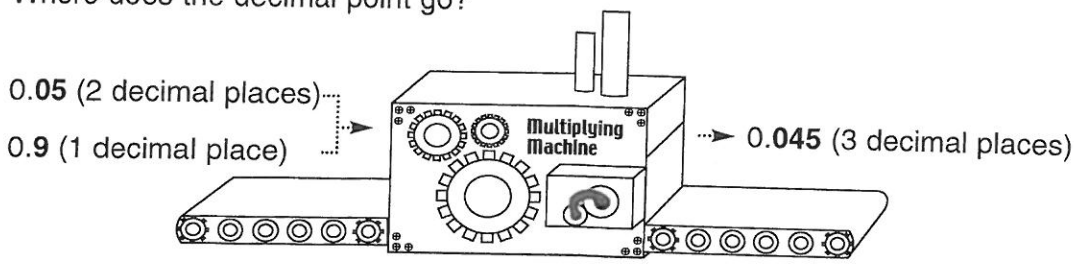
0.2 × 0.6
Where does the decimal point go?




**2 decimal places in** 0.2 × 0.6 **2 decimal places out**

## Problem 2

0.05 × 0.9
Where does the decimal point go?




**3 decimal places in** 0.05 × 0.9 **3 decimal places out**

## Think and Discuss

1. If Problem 1 was 0.20 × 0.60, where would you place the decimal point? Explain.

_____

_____

2. How do you know that the decimal point in Problem 2 is placed correctly?

_____

_____

Name _____ Date _____ Class _____

LESSON 3-5

# Practice A

## *Dividing Decimals by Whole Numbers*

**Find each quotient.**

1. $2.8 \div 4$ _____
2. $1.8 \div 2$ _____
3. $3.6 \div 6$ _____
4. $7.2 \div 9$ _____
5. $0.15 \div 3$ _____
6. $4.8 \div 8$ _____
7. $0.8 \div 4$ _____
8. $2.1 \div 7$ _____
9. $0.32 \div 4$ _____
10. $5.4 \div 9$ _____
11. $3.5 \div 5$ _____
12. $0.2 \div 2$ _____

**Evaluate $2.4 \div x$ for each given value of $x$.**

13. $x = 8$ _____
14. $x = 2$ _____
15. $x = 3$ _____
16. $x = 4$ _____
17. $x = 6$ _____
18. $x = 12$ _____

19. A six-pack of orange soda costs $4.20. How much does each can in the pack cost?

_____

20. It rained 2.7 inches in July and 2.1 inches in August. What was the average rainfall for those two months?

_____

Name _____ Date _____ Class _____

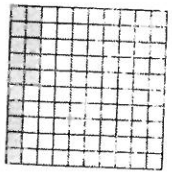
LESSON 3-5

# Reading Strategies

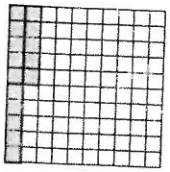
## *Use a Visual Tool*

You can use a hundred grid to show division with decimals.

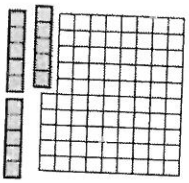
The grid shows 0.15. →



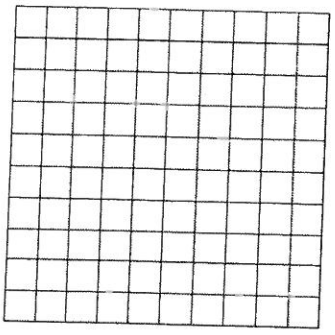
0.15 ÷ 3 means "separate 0.15 into 3 equal groups." →



0.15 ÷ 3 makes 3 equal groups of 0.05. →



0.15 ÷ 3 = 0.05



**Use the grid to complete Exercises 1–4.**

1. Shade 0.60 of the grid.
2. Divide the grid into 3 equal groups.
3. Write the decimal amount in each of the 3 groups. _____
4. Write a division problem for the picture you have created.

_____

Name _____ Date _____ Class _____

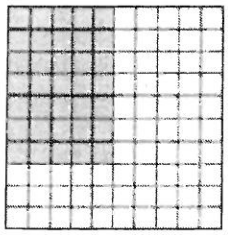
LESSON 3-5

# Review for Mastery

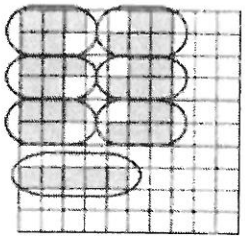
## *Dividing Decimals by Whole Numbers*

You can use decimal grids to help you divide decimals by whole numbers.

To divide 0.35 by 7, first shade in a decimal grid to show thirty-five hundredths.



0.35 ÷ 7 means "divide 0.35 into 7 equal groups." Show this on the decimal grid.

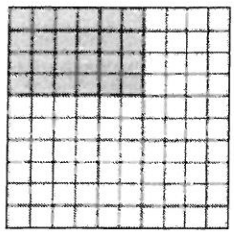


The number of units in each group is the quotient.

So, 0.35 ÷ 7 = 0.05.

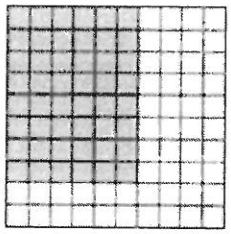
**Use decimal grids to find each quotient.**

1. 0.24 ÷ 4



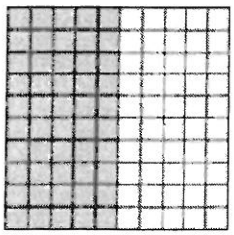
_____

2. 0.48 ÷ 12



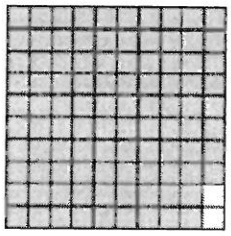
_____

3. 0.50 ÷ 10



_____

4. 0.98 ÷ 7



_____

5. 0.6 ÷ 5 _____

6. 0.78 ÷ 6 _____

7. 0.99 ÷ 11 _____

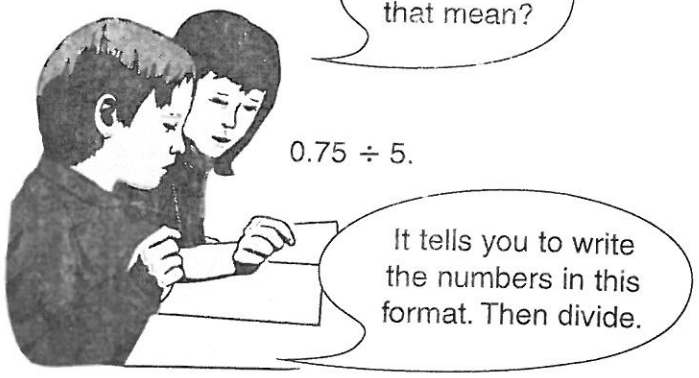
8. 0.32 ÷ 4 _____

Name _____ Date _____ Class _____

LESSON 3-5 **Student Worksheet**

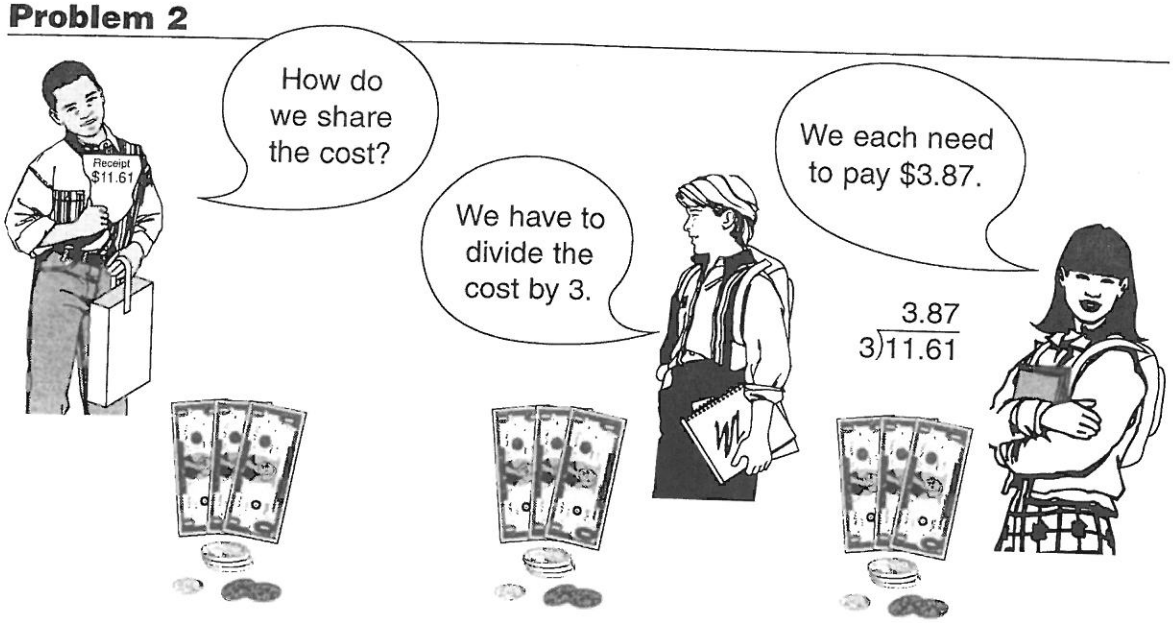
## *Dividing Decimals by Whole Numbers*

### Problem 1




$5\overline{)0.75}$ ⇨ $5\overline{)0.75}$ (0.15)

### Problem 2




### Think and Discuss

1. How do you know where to place the decimal point in the quotient in Problem 1?

2. How can you determine if your answer to Problem 2 is correct?

Name _____ Date _____ Class _____

LESSON 3-6

# Practice A

## *Dividing by Decimals*

**Find each quotient.**

1. $2.4 \div 0.4$ _____
2. $1.4 \div 0.2$ _____
3. $4.8 \div 0.6$ _____
4. $8.1 \div 0.9$ _____
5. $1.8 \div 0.3$ _____
6. $6.4 \div 0.8$ _____
7. $3.3 \div 0.3$ _____
8. $2.6 \div 1.3$ _____
9. $7.2 \div 1.2$ _____
10. $7.5 \div 1.5$ _____
11. $6.0 \div 0.5$ _____
12. $9.9 \div 1.1$ _____

**Evaluate $4.8 \div x$ for each value of $x$.**

13. $x = 0.2$ _____
14. $x = 0.4$ _____
15. $x = 0.3$ _____
16. $x = 0.6$ _____
17. $x = 0.8$ _____
18. $x = 1.2$ _____

19. Antonio spent $5.60 on cashews. They cost $1.40 per pound. How many pounds of cashews did Antonio buy?

_____

20. Over several months, a scientist measured a total of 6.3 inches of snow. The average snowfall each month was 2.1 inches. How many months did the scientist measure the snow?

_____

Name _____ Date _____ Class _____

LESSON 3-6

# Reading Strategies

## *Make Predictions*

Study the examples below. Look for patterns in the divisor and quotient.

| Dividend | | Divisor | | Quotient |
|---|---|---|---|---|
| 400 | ÷ | 20 | = | 20 |
| 400 | ÷ | 2 | = | 200 |
| 400 | ÷ | 0.2 | = | 2,000 |
| 400 | ÷ | 0.02 | = | 20,000 |

As the divisor is divided by 10, the quotient is multiplied by 10.

**Use the information above to answer Exercises 1–3.**

1. Predict the divisor for the next problem in this pattern.

_____

2. Predict the quotient for the next problem in this pattern.

_____

3. Write the next division problem and quotient for this pattern.

_____

**Study the pattern created by these division problems. Use the pattern to answer Exercises 4–6.**

| Dividend | | Divisor | | Quotient |
|---|---|---|---|---|
| 900 | ÷ | 30 | = | 30 |
| 900 | ÷ | 3 | = | 300 |
| 900 | ÷ | 0.3 | = | 3,000 |

4. Predict the next divisor in this pattern.

_____

5. Predict the next quotient in this pattern.

_____

6. Write the division problem and quotient that you predict would come next.

_____

Name _____ Date _____ Class _____

LESSON 3-6

# Review for Mastery

## *Dividing by Decimals*

You can use powers of ten to help you divide a decimal by a decimal.

To divide 0.048 by 0.12, first multiply each number by the least power of ten that makes the divisor a whole number.

$0.048 \div 0.12$

$0.12 \cdot 10^2 = 12$ Move the decimal point 2 places to the right.

$0.048 \cdot 10^2 = 4.8$ Move the decimal point 2 places to the right.

Then divide.

$4.8 \div 12$

**Step 1:** Divide as you would divide a whole number by a whole number.

$$12\overline{)4.8}$$

**Step 2:** Think $48 \div 12 = 4$.

$$\begin{array}{r} 0.4 \\ 12\overline{)4.8} \\ \underline{4\,8} \\ 0 \end{array}$$

**Step 3:** Bring the decimal into the quotient and add a zero placeholder if necessary.

So, $0.048 \div 0.12 = 0.4$.

**Find each quotient.**

1. $0.7\overline{)0.42}$
2. $0.08\overline{)0.4}$
3. $0.5\overline{)0.125}$
4. $0.02\overline{)0.3}$
5. $0.4\overline{)0.08}$
6. $0.9\overline{)0.63}$
7. $0.008\overline{)0.4}$
8. $0.04\overline{)0.032}$
9. $0.3\overline{)0.06}$
10. $0.04\overline{)0.2}$
11. $0.007\overline{)4.9}$
12. $0.6\overline{)0.012}$

Name _____ Date _____ Class _____

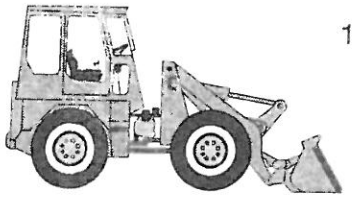
LESSON 3-6

# Student Worksheet

## *Dividing by Decimals*

### Problem 1

Find 3.6 ÷ 1.2.

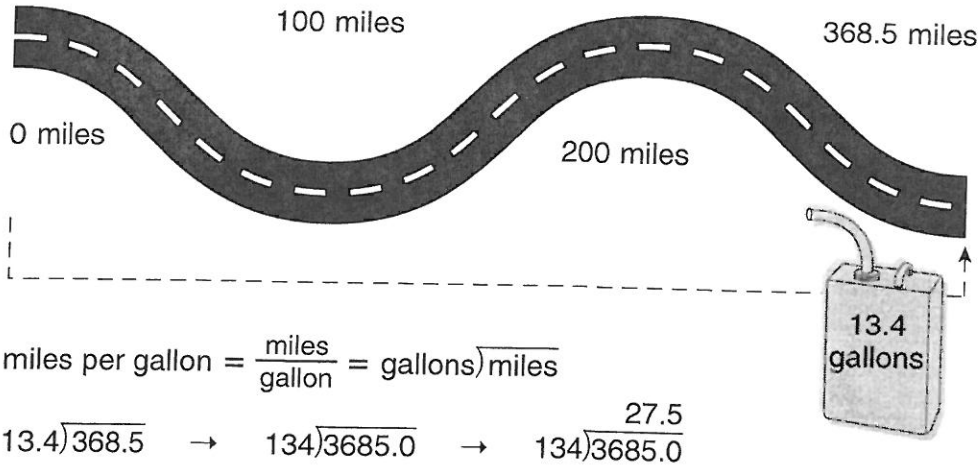


$1.2\overline{)3.6}$ → $12\overline{)36}$

Divisor Dividend

There is 1 decimal place in the divisor, so multiply by $10^1$, or 10.
That means to move the decimal 1 place to the right.

### Problem 2




$$\text{miles per gallon} = \frac{\text{miles}}{\text{gallon}} = \text{gallons}\overline{)\text{miles}}$$

$13.4\overline{)368.5}$ → $134\overline{)3685.0}$ → $\begin{array}{r}27.5\\134\overline{)3685.0}\end{array}$

### Think and Discuss

1. Does the quotient in Problem 1 have a remainder? How do you know?

2. How do you check the answer to a division problem?

Name _____ Date _____ Class _____

LESSON 3-7

# Practice A

## *Interpreting the Quotient*

**Circle the letter of the correct answer.**

1. Hamburger rolls come in packs of 8. How many packs should you buy to have 60 rolls?

   A 8
   B 6
   C 5
   D 7

2. Each pack of hamburger rolls costs $1.50. How many packs can you buy with $8.00?

   F 6
   G 5
   H 4
   I 8

3. How many 0.6-pound hamburgers can you make with 7.8 pounds of ground beef?

   A 13
   B 14
   C 10
   D 16

4. You spend a total of $5.10 for 3 pounds of ground beef. How much does the ground beef cost per pound?

   F $0.70
   G $0.17
   H $15.30
   I $1.70

**Write the correct answer.**

5. Four friends equally shared the cost of buying supplies for the class picnic. The supplies cost a total of $12.40. How much did they each pay?

   _____

6. In all, 20 people are going to the picnic. Each van seats 6 people. How many vans are needed to take everyone to the picnic?

   _____

7. Plastic forks come in packs of 6. If you need 40 forks for the picnic, how many packs should you buy?

   _____

8. You spent a total of $9.60 on paper plates for the picnic. Each pack costs $1.20. How many packs of paper plates did you buy?

   _____

Name _____ Date _____ Class _____

LESSON 3-7

# Reading Strategies

## *Use Context*

How the decimal portion of the quotient in a division problem is used depends upon the situation.

Situation 1 74 students are going on a field trip in cars. Each car can carry 5 students. How many cars are needed?

Divide 74 by 5. ⟶ $74 \div 5 = 14.8$ cars

Reasoning 14 cars will not be enough for all students. You need 15 cars. The quotient 14.8 needs to be rounded up to 15 in this situation.

Situation 2 How many 8 oz servings are in a 44 oz can of juice?

Divide 44 by 8. ⟶ $44 \div 8 = 5.5$ servings

Reasoning There are 5 full 8 oz servings in the can. The 0.5 serving is not 8 ounces. The quotient 5.5 is rounded down to 5 in this situation.

Situation 3 4 boys mowed a lawn for $35. How much money should each boy receive to share the money equally?

Divide $35 by 4. ⟶ $\$35 \div 4 = \$8.75$

Reasoning The exact quotient of $8.75 states what each boy should receive. The exact quotient of $8.75 makes sense.

**Tell whether you would round the quotient up, round the quotient down, or leave the exact quotient for each. Write to explain your choice.**

1. You need 8 inches of ribbon to make a bow. How many bows can you make with 50 inches of ribbon? $50 \div 8 = 6.25$

_____

2. Each lunch table seats 10 children. There are 155 children in the cafeteria for each lunch period. How many tables are needed? $155 \div 10 = 15.5$

_____

Name _____ Date _____ Class _____

LESSON 3-7

# Review for Mastery

## *Interpreting the Quotient*

There are three ways the decimal part of a quotient can be interpreted when you solve a problem.

**If the question asks for an exact number, use the entire quotient.**

**If the question asks how many whole groups are needed to put all items of the dividend into a group, round the quotient up to the next whole number.**

**If the question asks how many whole groups can be made, drop the part of the quotient to the right of the decimal point.**

To interpret the quotient, decide what the question is asking.

In the school library, there are tables that seat 4 students each. If there are 30 students in a class, how many tables are needed to seat all of the students?

To solve, divide 30 by 4.

$30 \div 4 = 7.5$

The question is asking how many tables (whole groups) are needed to put all of the students in the class (dividend) into a group.

So, round 7.5 up to the next whole number.

8 tables are needed to seat all of the students.

**Interpret the quotient to solve each problem.**

1. A recipe that serves 6 requires 9 cups of milk. How much milk is needed for each serving?

_____

2. A storage case holds 24 model cars. Marla has 84 model cars. How many storage cases does she need to store all of her cars?

_____

3. Kenny has $4.25 to spend at the school carnival. If game tickets are $0.50 each, how many games can Kenny play?

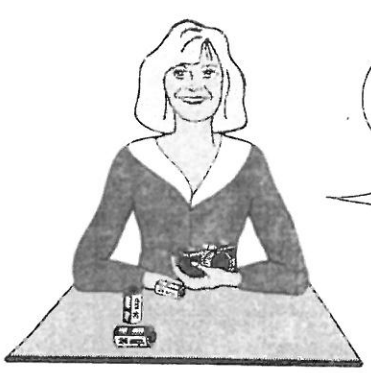
_____

Name _____ Date _____ Class _____

LESSON 3-7 **Student Worksheet**

*Interpreting the Quotient*

## Problem 1



How many rolls of film do I need?

| Number of students | | Number of exposures on each roll | | Number of rolls of film |
|---|---|---|---|---|
| 246 | ÷ | 24 | = | 10.25 |

$$\begin{array}{r} 10.25 \\ 24\overline{)\,246.0} \\ -24 \\ \hline 060 \\ -48 \\ \hline 120 \end{array}$$

I cannot buy part of a roll, so I will have to round up to 11.

## Think and Discuss

1. If the teacher only bought 10 rolls of film, what would happen?

_____

2. Why can't the teacher use the exact quotient as her answer?

_____

_____

Name _____ Date _____ Class _____

LESSON 4-9

# Practice A

## *Estimating Fraction Sums and Differences*

**Round each number to 0, $\frac{1}{2}$, or 1.**

1. $\frac{1}{6}$ _____
2. $\frac{3}{7}$ _____
3. $\frac{7}{8}$ _____
4. $\frac{2}{5}$ _____
5. $\frac{9}{10}$ _____
6. $\frac{2}{15}$ _____

**Estimate each sum or difference by rounding to 0, $\frac{1}{2}$, or 1.**

7. $\frac{2}{3} + \frac{3}{4}$ _____
8. $\frac{5}{6} - \frac{3}{5}$ _____
9. $\frac{4}{9} + \frac{1}{8}$ _____
10. $\frac{8}{9} - \frac{6}{7}$ _____
11. $\frac{1}{4} + \frac{2}{3}$ _____
12. $\frac{3}{4} - \frac{2}{3}$ _____
13. $\frac{4}{7} + \frac{3}{5}$ _____
14. $\frac{1}{5} + \frac{4}{9}$ _____
15. $\frac{3}{4} - \frac{4}{7}$ _____

**Use the table for Exercises 16 and 17.**

16. About how far did Mia swim during week 1 and week 2 altogether?

_____

17. About how much farther did Mia swim during week 3 than during week 1?

_____

**Mia's Swimming Distances**

| Week | Distance (mi) |
|---|---|
| 1 | $1\frac{1}{4}$ |
| 2 | $\frac{2}{3}$ |
| 3 | $1\frac{5}{6}$ |

18. Shelley used $\frac{3}{5}$ ounce of water in her experiment. Ali used $\frac{7}{9}$ ounce of water in his experiment. Who used more water and about how much more water was used?

_____

19. Fred ran $1\frac{6}{11}$ of a mile, and then he walked $1\frac{5}{8}$ of a mile. About how many miles did Fred cover in all?

_____

Name _____ Date _____ Class _____

LESSON 4-9

# Reading Strategies

## *Use a Graphic Aid*

When you don't need exact values of fractions, you can use a number line to help you estimate the values by rounding.

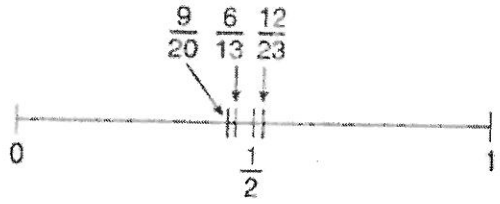
### Fractions Close to 1

The number line shows that the fractions $\frac{5}{6}$ and $\frac{7}{8}$ are both close to 1. When the numerator and denominator of a fraction are close to the same value, round to 1.


### Fractions Close to $\frac{1}{2}$

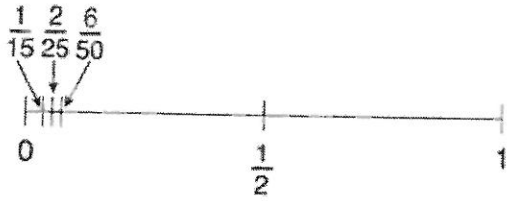
The number line shows fractions such as $\frac{6}{13}$, $\frac{9}{20}$, and $\frac{12}{23}$ that are close to $\frac{1}{2}$.

When the numerator is about half the value of the denominator, round to $\frac{1}{2}$.




### Fractions Close to 0

The number line shows fractions such as $\frac{1}{15}$, $\frac{6}{50}$, and $\frac{2}{25}$ that are close to 0. When the numerator is much less than the denominator, round to 0.




**Estimate the value of each fraction. Write *close to 0, close to $\frac{1}{2}$,* or *close to 1.***

1. $\frac{12}{25}$ _____

2. $\frac{1}{17}$ _____

3. $\frac{8}{9}$ _____

4. $\frac{9}{10}$ _____

Name _____ Date _____ Class _____

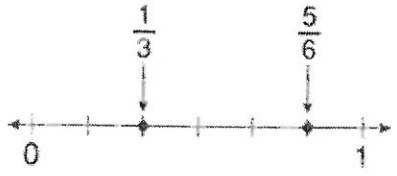
LESSON 4-9

# Review for Mastery

## *Estimating Fraction Sums and Differences*

You can use number lines to help you estimate fraction sums and differences.

To estimate the sum of $\frac{5}{6}$ and $\frac{1}{3}$, locate each fraction on a number line. Then round each fraction to 0, $\frac{1}{2}$, or 1.

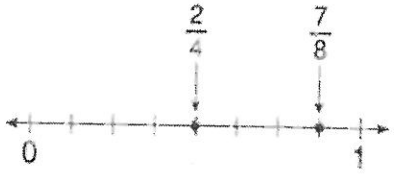



$\frac{5}{6} + \frac{1}{3}$

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

So, $\frac{5}{6} + \frac{1}{3}$ is about $1\frac{1}{2}$.

To estimate the difference between $\frac{7}{8}$ and $\frac{2}{4}$, locate each fraction on a number line. Then round each fraction to 0, $\frac{1}{2}$, or 1.

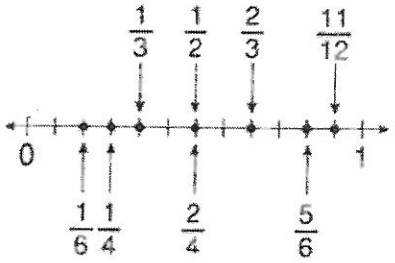



$\frac{7}{8} - \frac{2}{4}$

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

So, $\frac{7}{8} - \frac{2}{4}$ is about $\frac{1}{2}$.

**Use the number line to round each fraction to 0, $\frac{1}{2}$, or 1 to estimate each sum or difference.**



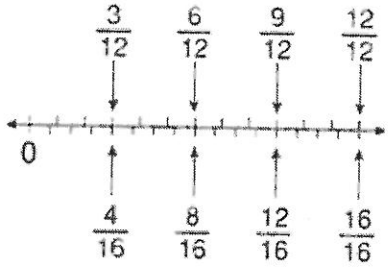

1. $\frac{5}{6} + \frac{1}{6}$ _____

2. $\frac{11}{12} - \frac{1}{2}$ _____

3. $\frac{2}{3} + \frac{2}{4}$ _____

4. $\frac{1}{4} - \frac{1}{3}$ _____

**Use the number line to round each fraction to 0, $\frac{1}{2}$, or 1 to estimate each sum or difference.**




5. $\frac{7}{12} + \frac{2}{6}$ _____

6. $\frac{5}{6} - \frac{3}{8}$ _____

7. $\frac{1}{4} + \frac{2}{6}$ _____

8. $\frac{7}{8} + \frac{14}{16}$ _____

Name _____ Date _____ Class _____

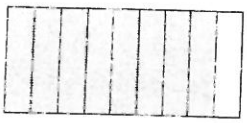
LESSON 4-9 **Student Worksheet**

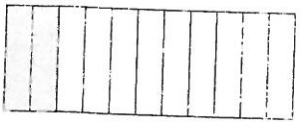
## *Estimating Fraction Sums and Differences*

### Problem 1

Estimate the sum or difference.

A.





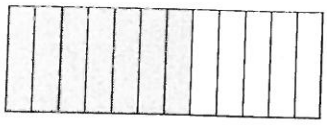
$\frac{8}{9}$ + $\frac{2}{11}$

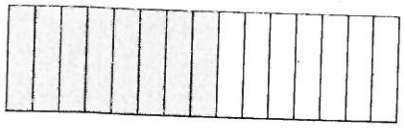
$\downarrow$ $\downarrow$

1 + 0 = 1

$\frac{8}{9}$ + $\frac{2}{11}$ is **about** 1

B.





$\frac{7}{12}$ − $\frac{8}{15}$

$\downarrow$ $\downarrow$

$\frac{1}{2}$ − $\frac{1}{2}$ = 0

$\frac{7}{12}$ − $\frac{8}{15}$ is **about** 0

## Think and Discuss

**1.** Explain how to round a fraction to 0, $\frac{1}{2}$, or 1.

_____

_____

**2.** In Problem 1, why does the answer say that the sum is *about* 1?

_____

Name _____ Date _____ Class _____

LESSON 5-5

# Practice A

## *Multiplying Fractions by Whole Numbers*

**Multiply. Write each answer in simplest form.**

1. $1 \cdot \frac{1}{3}$ _____
2. $3 \cdot \frac{1}{8}$ _____
3. $7 \cdot \frac{1}{9}$ _____
4. $3 \cdot \frac{1}{4}$ _____
5. $4 \cdot \frac{2}{10}$ _____
6. $3 \cdot \frac{1}{6}$ _____
7. $2 \cdot \frac{2}{5}$ _____
8. $10 \cdot \frac{1}{2}$ _____
9. $5 \cdot \frac{1}{8}$ _____
10. $4 \cdot \frac{1}{6}$ _____
11. $7 \cdot \frac{1}{8}$ _____
12. $3 \cdot \frac{2}{6}$ _____
13. $7 \cdot \frac{1}{11}$ _____
14. $3 \cdot \frac{1}{9}$ _____
15. $5 \cdot \frac{1}{15}$ _____

**Evaluate $2x$ for each value of $x$. Write the answer in simplest form.**

16. $x = \frac{1}{4}$ _____
17. $x = \frac{1}{3}$ _____
18. $x = \frac{1}{2}$ _____
19. $x = \frac{1}{6}$ _____
20. $x = \frac{1}{7}$ _____
21. $x = \frac{1}{8}$ _____
22. $x = \frac{2}{3}$ _____
23. $x = \frac{3}{4}$ _____

24. Richie is making 3 quarts of fruit punch for his friends. He must add $\frac{1}{2}$ cup sugar to make each quart of punch. How much sugar will he add?

_____

25. Mrs. Flynn has 20 students in her class. One-fourth of her students purchased lunch tokens. How many of her students purchased tokens?

_____

Name _____ Date _____ Class _____

LESSON 5-5

# Reading Strategies

## *Relate Words and Symbols*

Repeated addition is a way to represent multiplication of fractions.

$\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{3}{8}$ → Repeated addition

three times one-eight = three-eighths → Words

$3 \cdot \frac{1}{8} = \frac{3}{8}$ → Symbols

**Answer the following questions.**

1. What is $\frac{2}{8} \cdot 2$? _____

2. What is three-eighths times two? _____

3. What is $\frac{1}{8} \cdot 4$? _____

4. Write $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ as a multiplication problem. _____

**Use the rectangle to answer each question.**

5. What is two-tenths times two? _____

6. What is $\frac{1}{10} \cdot 4$? _____

7. What is four-tenths times two? _____

8. Write $\frac{1}{10} + \frac{1}{10} + \frac{1}{10} + \frac{1}{10}$ as a multiplication problem in words.

_____

Name _____ Date _____ Class _____

LESSON 5-5

# Review for Mastery

## *Multiplying Fractions by Whole Numbers*

You can use fraction strips to multiply fractions by whole numbers.

To find $3 \cdot \frac{2}{3}$, first think about the expression in words.

$3 \cdot \frac{2}{3}$ means "3 groups of $\frac{2}{3}$."

Then model the expression.


The total number of $\frac{1}{3}$ fraction pieces is 6.

So, $3 \cdot \frac{2}{3} = \frac{2}{3} + \frac{2}{3} + \frac{2}{3} =$

$\frac{6}{3} = 2$ in simplest form.

**Use fraction strips to find each product.**

1. $4 \cdot \frac{1}{8}$ _____
2. $2 \cdot \frac{2}{5}$ _____
3. $6 \cdot \frac{1}{8}$ _____
4. $8 \cdot \frac{1}{4}$ _____

You can also use counters to multiply fractions by whole numbers.

To find $\frac{1}{2} \cdot 12$, first think about the expression in words.

$\frac{1}{2} \cdot 12 = \frac{12}{2}$, which means "12 divided into 2 equal groups."

Then model the expression.

The number of counters in each group is the product.

$\frac{1}{2} \cdot 12 = 6$.

**Use counters to find each product.**

5. $\frac{1}{3} \cdot 15$ _____
6. $\frac{1}{8} \cdot 24$ _____
7. $\frac{1}{4} \cdot 16$ _____
8. $\frac{1}{12} \cdot 24$ _____

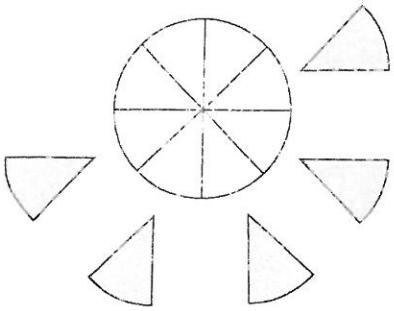
Name _____ Date _____ Class _____

LESSON 5-5 **Student Worksheet**

## *Multiplying Fractions by Whole Numbers*

### Problem 1

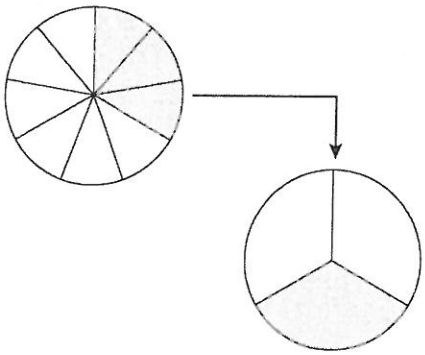
How do you multiply fractions and whole numbers?



Remember:
$5 = \frac{5}{1}$

$$\frac{5}{1} \cdot \frac{1}{8} = \frac{5}{8}$$

### Problem 2



$$\frac{3}{1} \cdot \frac{1}{9} = \frac{3}{9}$$

$$\frac{3}{9} = \frac{1}{3}$$

### Think and Discuss

1. What is the first step in multiplying a whole number by a fraction?

2. How does multiplying fractions differ from adding fractions?

# 5-5 Exercises

Homework Help THINK central
Go to thinkcentral.com
Exercises 1-20, 31, 35, 37, 43, 45, 47, 51

MA.6.A.1.2, MA.6.A.1.3

## GUIDED PRACTICE

See Example 1 **Multiply. Write each answer in simplest form.**

1. $8 \cdot \frac{1}{9}$
2. $2 \cdot \frac{1}{5}$
3. $12 \cdot \frac{1}{4}$
4. $7 \cdot \frac{4}{9}$
5. $3 \cdot \frac{1}{7}$
6. $4 \cdot \frac{2}{11}$
7. $8 \cdot \frac{3}{4}$
8. $10 \cdot \frac{1}{3}$

See Example 2 **Evaluate $12x$ for each value of $x$. Write each answer in simplest form.**

9. $x = \frac{2}{3}$
10. $x = \frac{1}{2}$
11. $x = \frac{3}{4}$
12. $x = \frac{5}{6}$

See Example 3 13. The school Community Service Club has 45 members. Of these 45 members, $\frac{2}{5}$ are boys. How many boys are members of the Community Service Club?

## INDEPENDENT PRACTICE

See Example 1 **Multiply. Write each answer in simplest form.**

14. $4 \cdot \frac{1}{10}$
15. $6 \cdot \frac{1}{8}$
16. $3 \cdot \frac{1}{12}$
17. $2 \cdot \frac{2}{5}$
18. $6 \cdot \frac{10}{11}$
19. $2 \cdot \frac{3}{11}$
20. $15 \cdot \frac{2}{15}$
21. $20 \cdot \frac{1}{2}$

See Example 2 **Evaluate $8x$ for each value of $x$. Write each answer in simplest form.**

22. $x = \frac{1}{2}$
23. $x = \frac{3}{4}$
24. $x = \frac{1}{8}$
25. $x = \frac{1}{4}$
26. $x = \frac{4}{5}$
27. $x = \frac{5}{7}$
28. $x = \frac{7}{8}$
29. $x = \frac{4}{9}$

See Example 3 30. **School** Kiesha spent 120 minutes completing her homework last night. Of those minutes, $\frac{1}{6}$ were spent on Spanish. How many minutes did Kiesha spend on her Spanish homework?

## PRACTICE AND PROBLEM SOLVING

**Evaluate each expression. Write each answer in simplest form.**

31. $12b$ for $b = \frac{7}{12}$
32. $20m$ for $m = \frac{1}{20}$
33. $33z$ for $z = \frac{5}{11}$
34. $\frac{2}{3}y$ for $y = 18$
35. $\frac{1}{4}x$ for $x = 20$
36. $\frac{3}{5}a$ for $a = 30$
37. $\frac{4}{5}c$ for $c = 12$
38. $14x$ for $x = \frac{3}{8}$
39. $\frac{9}{10}n$ for $n = 50$

**Compare. Write <, >, or =.**

40. $9 \cdot \frac{1}{16} \_\_ \frac{1}{2}$
41. $15 \cdot \frac{2}{5} \_\_ 5$
42. $\frac{8}{13} \_\_ 4 \cdot \frac{2}{13}$
43. $3 \cdot \frac{2}{9} \_\_ \frac{2}{3}$
44. $6 \cdot \frac{4}{15} \_\_ \frac{11}{24}$
45. $5 \_\_ 12 \cdot \frac{3}{4}$
46. $3 \cdot \frac{1}{7} \_\_ 3 \cdot \frac{1}{5}$
47. $7 \cdot \frac{3}{4} \_\_ 6 \cdot \frac{3}{7}$
48. $2 \cdot \frac{5}{6} \_\_ 6 \cdot \frac{2}{5}$

49. Denise spent $55 shopping. Of that $55, she spent $\frac{3}{5}$ on a pair of shoes. How much money did Denise spend on the pair of shoes?



O = WORKED-OUT SOLUTIONS on p. WS6

## Life Science LINK

The General Sherman, a giant sequoia tree in California's Sequoia National Park, is one of the largest trees in the world at 275 ft tall.

California also has some of the nation's tallest grand firs, ponderosa pines, and sugar pines. The table shows how the heights of these trees compare with the height of the General Sherman. For example, the grand fir is $\frac{23}{25}$ the height of the General Sherman.

**50.** Find the heights of the trees in the table. Write your answers in simplest form.

**51.** The world's tallest bluegum eucalyptus tree is $\frac{3}{5}$ the height of the General Sherman tree. How tall is this bluegum eucalyptus?

**52.** **What's the Question?** Joshua trees can grow to be 40 ft tall. The answer is $\frac{8}{55}$. What is the question?

**53.** **Write About It** Find $\frac{1}{5}$ the height of the General Sherman. Then divide the height of the General Sherman by 5. What do you notice? Why does this make sense?

**54.** **Challenge** The world's tallest incense cedar tree is 152 ft tall. What is $\frac{1}{5}$ of $\frac{1}{2}$ of $\frac{1}{4}$ of 152?

| Tree Heights Compared with the General Sherman | |
|---|---|
| Tallest Grand Fir | $\frac{23}{25}$ |
| Tallest Ponderosa Pine | $\frac{41}{50}$ |
| Tallest Sugar Pine | $\frac{21}{25}$ |

Source: The Top 10 of Everything 2003

## Florida Spiral Review

MA.6.A.1.2, MA.6.A.1.3, MA.6.A.3.1

**55.** **Multiple Choice** A recipe uses $\frac{1}{3}$ cup of sugar. Daniela doubled the recipe. How much sugar did she use?

A. $\frac{1}{4}$ cup B. $\frac{1}{3}$ cup C. $\frac{2}{3}$ cup D. $\frac{3}{4}$ cup

**56.** **Extended Response** Mario bought $\frac{1}{5}$ pound of turkey. Rose bought four times as much turkey as Mario. And Celia bought 2 times as much as Rose. How many pounds of turkey did Rose buy? How many pounds did Celia buy? How much more did Celia buy than Mario? Show your work.

**Write each phrase as a numerical or algebraic expression.** (Lesson 2-3)

**57.** $w$ less than 75 **58.** the product of $n$ and 16 **59.** the quotient of $p$ and 7

**60.** Jennifer has 50 oz of formula to make bottles for her twin babies. Each bottle needs to have 6.5 oz of formula. How many bottles can Jennifer make? (Lesson 3-7)

Name _____ Date _____ Class _____

LESSON 5-6

# Practice A

## *Multiplying Fractions*

**Multiply. Write each answer in simplest form.**

1. $\frac{1}{2} \cdot \frac{1}{7}$ _____

2. $\frac{1}{4} \cdot \frac{1}{4}$ _____

3. $\frac{1}{5} \cdot \frac{1}{3}$ _____

4. $\frac{2}{3} \cdot \frac{1}{3}$ _____

5. $\frac{2}{3} \cdot \frac{2}{7}$ _____

6. $\frac{1}{4} \cdot \frac{1}{5}$ _____

7. $\frac{1}{3} \cdot \frac{2}{5}$ _____

8. $\frac{1}{4} \cdot \frac{2}{3}$ _____

9. $\frac{1}{3} \cdot \frac{1}{3}$ _____

**Evaluate the expression $x \cdot \frac{1}{2}$ for each value of $x$. Write the answer in simplest form.**

10. $x = \frac{1}{2}$ _____

11. $x = \frac{1}{3}$ _____

12. $x = \frac{1}{4}$ _____

13. $x = \frac{1}{5}$ _____

14. $x = \frac{2}{3}$ _____

15. $x = \frac{3}{4}$ _____

16. In Mr. Sanders class, $\frac{1}{3}$ of the students are girls. About $\frac{1}{4}$ of the girls want to join the chorus. What fraction of all the students in Mr. Sanders's class want to join the chorus?

_____

17. A recipe for trail mix calls for $\frac{3}{4}$ pound of peanuts. Luiza only wants to make half of the recipe's servings. How many pounds of peanuts should she use?

_____

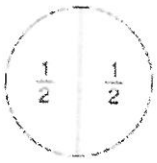
Name _____ Date _____ Class _____

LESSON 5-6

# Reading Strategies

## *Use Graphic Aids*

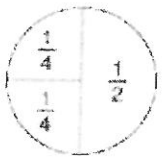
The circle below is divided into two equal parts. Each part is equal to one-half.




If one-half of the circle is split in half, it looks like this.

$\frac{1}{2}$ of $\frac{1}{2}$ is $\frac{1}{4}$

$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$




The drawing shows a rectangle divided into thirds.


1. If you divide $\frac{1}{3}$ of the rectangle in half, what fractional part will that be? _____

2. One-half of $\frac{1}{3}$ = _____

3. $\frac{1}{2} \cdot \frac{1}{3}$ = _____

To multiply fractions:

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

$\frac{2 \cdot 1}{3 \cdot 4} = \frac{2}{12}$ ← Multiply numerators. ← Multiply denominators.

$\frac{2}{12} = \frac{1}{6}$ ← Answer in simplest form

**Use the problem $\frac{2}{5} \cdot \frac{3}{4}$ to answer the following questions.**

4. When you multiply the numerators, the product is _____.

5. When you multiply the denominators, the product is _____.

6. $\frac{2}{5} \cdot \frac{3}{4}$ = _____

Name _____ Date _____ Class _____

LESSON 5-6

# Review for Mastery

## *Multiplying Fractions*

To multiply fractions, multiply the numerators and multiply the denominators.

When multiplying fractions, you can sometimes divide by the GCF to make the problem simpler.

You can divide by the GCF even if the numerator and denominator of the same fraction have a common factor.

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

$\frac{1}{\cancel{2}} \cdot \frac{\cancel{2}}{3}$

The problem is now $\frac{1}{1} \cdot \frac{1}{3}$.

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

So, $\frac{1}{2} \cdot \frac{2}{3} = \frac{1}{3}$

**Is it possible to simplify before you multiply? If so, what is the GCF?**

1. $\frac{1}{4} \cdot \frac{1}{2}$ _____
2. $\frac{1}{6} \cdot \frac{3}{4}$ _____
3. $\frac{1}{8} \cdot \frac{2}{3}$ _____
4. $\frac{1}{3} \cdot \frac{2}{5}$ _____

**Multiply.**

5. $\frac{1}{6} \cdot \frac{3}{5}$ _____
6. $\frac{1}{4} \cdot \frac{1}{3}$ _____
7. $\frac{7}{8} \cdot \frac{4}{5}$ _____
8. $\frac{1}{6} \cdot \frac{2}{3}$ _____
9. $\frac{1}{5} \cdot \frac{1}{2}$ _____
10. $\frac{3}{5} \cdot \frac{1}{4}$ _____
11. $\frac{3}{7} \cdot \frac{1}{9}$ _____
12. $\frac{3}{4} \cdot \frac{1}{2}$ _____
13. $\frac{1}{3} \cdot \frac{6}{7}$ _____
14. $\frac{1}{4} \cdot \frac{2}{3}$ _____
15. $\frac{3}{4} \cdot \frac{1}{3}$ _____
16. $\frac{1}{4} \cdot \frac{1}{8}$ _____

Name _____ Date _____ Class _____

LESSON 5-6

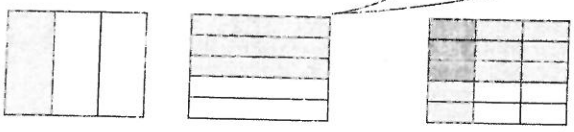
# Student Worksheet

## *Multiplying Fractions*

### Problem 1

How do I multiply fractions?

$\frac{1}{3} \cdot \frac{3}{5}$



$\frac{1}{3} \cdot \frac{3}{5} = \frac{1 \cdot 3}{3 \cdot 5}$

Multiply numerators and denominators.

$\frac{1 \cdot 3}{3 \cdot 5} = \frac{3}{15}$

$\frac{3 \div 3 = 1}{15 \div 3 = 5}$

Simplify.

$= \frac{1}{5}$

### Problem 2

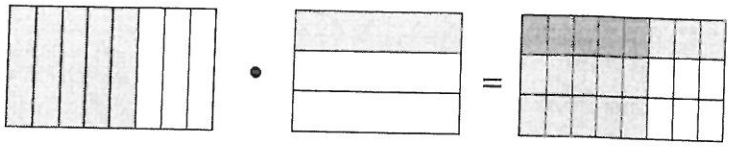
How do I evaluate an expression?

Evaluate $a \cdot \frac{1}{3}$ for $a = \frac{5}{8}$.

Replace $a$ with $\frac{5}{8}$.

$\frac{5}{8} \cdot \frac{1}{3} = \frac{5 \cdot 1}{8 \cdot 3} = \frac{5}{24}$

Multiply numerators and denominators.



### Think and Discuss

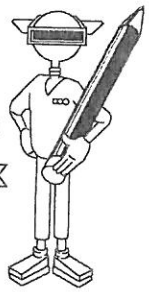
1. In Problem 1 how do you simplify the fraction $\frac{3}{15}$?

2. Explain how using a model can help you to multiply fractions.

Name _____ Date _____

COURSE: **MSC III**
MODULE 3: **Fractions**
UNIT 3: **Multiplication and Division**

# Finding Products



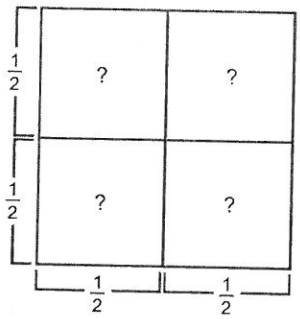

**As you work through the tutorial, complete the following.**

**1.** What is your mission for this lesson? _____

_____

**2.** The area of a rectangle can be found by multiplying its _____ and its _____.

**3.** The large square on the right has a length and width of 7 units.




**a.** The area of each small square is _____ divided by _____, and is equal to _____.

**b.** The length and width of each small square is _____, so the area of each small square can be written as ____ × ____ which equals _____.

**4.** The product of two fractions is equal to the product of the _____ over the product of the _____.

**5.** To complete the next step in finding the value of $\frac{1}{2} \times \frac{1}{4}$, you can write the fraction _____ over _____. Simplifying this fraction gives you _____.

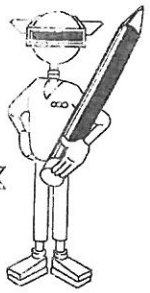
**6.** When you multiply a number by a fraction _____ than 1, the product will be less than the number multiplied.

**Key Words:**
Fraction
Denominator
Numerator

**Learning Objectives:**

- Calculate products of proper and improper fractions.
- Calculate products of fractions and mixed numbers.
- Estimate the products of two fractions.

Name _____ Date _____




**7.** To multiply a whole number and a fraction, first you can write the whole number as a(n) _____ fraction whose denominator is one .

**8.** What does the letter *L* represent in each of the mathematical expressions?

_____

**9.** If $L = 2\frac{3}{4}$ feet, you can multiply _____ and _____ to find the length of the string that will play high Do.

**10.** Before finding the value of $\frac{1}{2} \times 2\frac{3}{4}$, you can change the mixed number $2\frac{3}{4}$ to a(n) _____ fraction.

**11.** What is $\frac{1}{2} \times \frac{11}{4}$ written as an improper fraction? _____

**12.** What is mixed number that is the length of the string that will play high Do? _____

**13.** The value of $\frac{2}{3} \times 2\frac{3}{4}$ is less than $2\frac{3}{4}$ because _____ is less than _____ .

**14. a.** Write the expression $\frac{2}{3} \times 2\frac{3}{4}$ as the product of a fraction and an improper fraction. _____

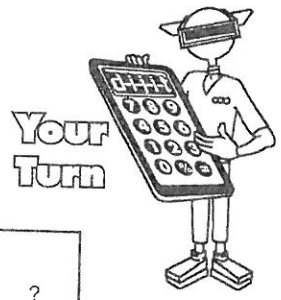
**b.** What is the improper fraction that is the product? _____

**c.** Express the product in part (b) in lowest terms. _____

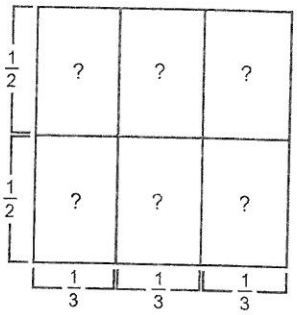
**d.** Express the product as a mixed number. _____

Name _____ Date _____

COURSE: **MSC III**
MODULE 3: **Fractions**
UNIT 3: **Multiplication and Division**




**1.** The large square on the right has a length and width if 1. It is divided into 6 rectangles whose sides are $\frac{1}{2}$ and $\frac{1}{3}$.




**a.** The area of each small rectangle is _____ divided by _____, which is equal to _____.

**b.** Write the multiplication expression that represents each area.

_____ × _____ = _____

**2.** Find each product. Write your answers as proper fractions or mixed numbers in lowest terms.

**a.** $\frac{2}{3} \times \frac{1}{4} =$ _____

**b.** $4 \times \frac{3}{7} =$ _____

**c.** $\frac{3}{5} \times \frac{2}{9} =$ _____

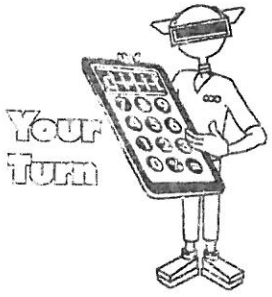
**d.** $\frac{1}{6} \times 8 =$ _____

**e.** $\frac{7}{8} \times \frac{2}{5} =$ _____

**f.** $\frac{2}{3} \times \frac{5}{8} =$ _____

**3.** Each week, a volunteer works 15 hours at her local public library. She has completed $\frac{4}{5}$ of her hours this week. How many hours has she worked this week? _____ Show your work.

Name _____ Date _____




**4.** Find each product. Write your answers in lowest terms.

**a.** $\frac{3}{4} \times 1\frac{2}{3} =$ _____

**b.** $2\frac{1}{7} \times \frac{4}{5} =$ _____

**c.** $\frac{2}{3} \times 3\frac{1}{4} =$ _____

**d.** $\frac{5}{8} \times 1\frac{3}{5} =$ _____

**e.** $5\frac{1}{2} \times \frac{4}{7} =$ _____

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

**5.** At the start of a trip, a bus driver notices that the gas tank contains $8\frac{2}{5}$ gallons of gas. At the end of the trip, The driver has used $\frac{5}{8}$ of the gas in the tank.

**a.** Write an expression that shows how much gas the bus driver used on his trip. _____

**b.** Will the product of your expression be greater than or less than $8\frac{2}{5}$ ? _____
Explain your answer without finding the product._____
_____

**c.** Find the actual number of gallons of gas that the bus driver used on his trip. Write your answer in lowest terms. _____

**6.** Each question on a social studies test is worth $3\frac{1}{3}$ points. If a student answers 24 questions correctly, how many points does she earn on the test? _____ Show your work.

Name _____ Date _____ Class _____

LESSON 5-7

# Practice A

## *Multiplying Mixed Numbers*

**Multiply. Write each answer in simplest form.**

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

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

   _____

2. $1\frac{1}{5} \cdot \frac{4}{5}$

   $\frac{}{5} \cdot \frac{4}{5}$

   _____

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

   $\frac{}{4} \cdot \frac{2}{3}$

   _____

4. $1\frac{1}{8} \cdot \frac{2}{5}$

   $\frac{}{8} \cdot \frac{2}{5}$

   _____

5. $\frac{2}{5} \cdot 1\frac{1}{2}$

   $\frac{2}{5} \cdot \frac{}{2}$

   _____

6. $1\frac{3}{5} \cdot \frac{1}{3}$

   $\frac{}{5} \cdot \frac{1}{3}$

   _____

7. $\frac{2}{7} \cdot 1\frac{1}{4}$

   _____

8. $\frac{2}{3} \cdot 1\frac{1}{10}$

   _____

9. $\frac{1}{8} \cdot 1\frac{1}{2}$

   _____

**Find each product. Write the answer in simplest form.**

10. $\frac{4}{5} \cdot 1\frac{1}{6}$

    _____

11. $\frac{3}{5} \cdot 1\frac{1}{4}$

    _____

12. $1\frac{3}{4} \cdot \frac{1}{3}$

    _____

13. $2 \cdot 1\frac{1}{2}$

    _____

14. $4 \cdot 2\frac{1}{4}$

    _____

15. $5 \cdot 1\frac{1}{5}$

    _____

16. Lin Li makes two and a half dollars per hour baby-sitting her little brother. How much money will she make if she baby-sits for 5 hours?

    _____

17. Andrea is baking 2 batches of cookies. The recipe calls for $4\frac{1}{2}$ cups of flour for each batch. How many cups of flour will she use?

    _____

Name _____ Date _____ Class _____

LESSON 5-7

# Reading Strategies

## *Use a Flow Chart*

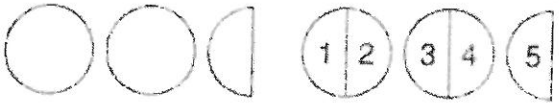
**Mixed Number**

Whole number → $2\frac{1}{2}$ ← Fraction

**Improper Fraction**

$$\frac{5}{2}$$

You can change mixed numbers to improper fractions.



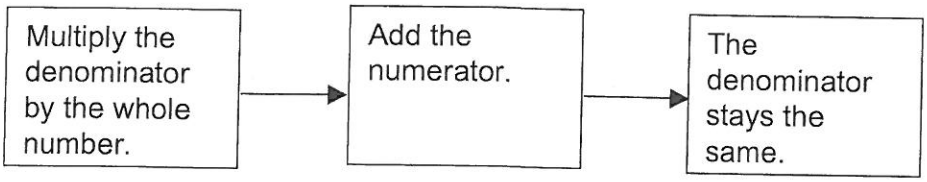

$2\frac{1}{2}$ = 5 halves or $\frac{5}{2}$ ← improper fraction

1. What is the mixed number in the above example? _____

2. What is the improper fraction? _____

3. How many halves are in $2\frac{1}{2}$? _____

**Use the flowchart below to help you change a mixed number to an improper fraction.**




**Change $3\frac{2}{5}$ to an improper fraction.**

4. What is the first step?

_____

5. What is the next step?

_____

6. The improper fraction is _____.

Name _____ Date _____ Class _____

LESSON 5-7

# Review for Mastery

## *Multiplying Mixed Numbers*

To find $\frac{1}{3}$ of $2\frac{1}{2}$, first change $2\frac{1}{2}$ to an improper fraction.

$2\frac{1}{2} = \frac{5}{2}$

Then multiply as you would with two proper fractions.

Check to see whether you can divide by the GCF to make the problem simpler. Then multiply the numerators and multiply the denominators.

The problem is now $\frac{1}{3} \cdot \frac{5}{2}$.

$\frac{1 \cdot 5}{3 \cdot 2} = \frac{5}{6}$

So, $\frac{1}{3} \cdot 2\frac{1}{2}$ is $\frac{5}{6}$.

**Rewrite each mixed number as an improper fraction. Is it possible to simplify before you multiply? If so, what is the GCF? Find each product. Write the answer in simplest form.**

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

   $= \frac{1}{4} \cdot$ ____

   _____

2. $\frac{1}{6} \cdot 2\frac{1}{2}$

   $= \frac{1}{6} \cdot$ ____

   _____

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

   $= \frac{1}{8} \cdot$ ____

   _____

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

   $= \frac{1}{3} \cdot$ ____

   _____

5. $1\frac{1}{3} \cdot 1\frac{2}{3}$

   $\overline{3} \cdot \overline{3}$

   _____

6. $1\frac{1}{2} \cdot 1\frac{1}{3}$

   $\overline{2} \cdot \overline{3}$

   _____

7. $1\frac{3}{4} \cdot 2\frac{1}{2}$

   $\overline{4} \cdot \overline{2}$

   _____

8. $1\frac{1}{6} \cdot 2\frac{2}{3}$

   $\overline{6} \cdot \overline{3}$

   _____

9. $3\frac{1}{3} \cdot \frac{2}{5}$

   _____

10. $2\frac{1}{2} \cdot \frac{1}{5}$

    _____

11. $1\frac{3}{4} \cdot 2\frac{1}{2}$

    _____

12. $3\frac{1}{3} \cdot 1\frac{1}{5}$

    _____

Name _____ Date _____ Class _____

LESSON 5-7

# Student Worksheet

## *Multiplying Mixed Numbers*

### Problem 1

How do I multiply a fraction by a mixed number?

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

Rewrite $1\frac{1}{2}$ as $\frac{3}{2}$.

$\frac{1}{3} \cdot \frac{3}{2} = \frac{3}{6}$ — Multiply.

$= \frac{1}{2}$ — Simplify.

Think: $1\frac{1}{2} = \frac{(2 \cdot 1) + 1}{2} = \frac{3}{2}$

### Problem 2

How do I multiply two mixed numbers?

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

Rewrite $2\frac{1}{2}$ as $\frac{5}{2}$ and $1\frac{1}{3}$ as $\frac{4}{3}$.

$\frac{5}{2} \cdot \frac{4}{3} = \frac{20}{6}$ — Multiply.

$= 3\frac{1}{3}$ — Simplify.

Think: $2\frac{1}{2} = \frac{(2 \cdot 2) + 1}{2} = \frac{5}{2}$

Think: $1\frac{1}{3} = \frac{(3 \cdot 1) + 1}{3} = \frac{4}{3}$

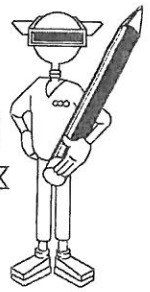
### Think and Discuss

1. Why is the product of the numbers in Problem 1 not $1\frac{1}{6}$?

2. What is the first thing you should do when you need to multiply two mixed numbers?

Name _____ Date _____

COURSE: **MSC IV**
MODULE 1: **Fractions**
UNIT 3: **Multiplying Fractions**




# Finding Products of Fractions, Whole Numbers, & Mixed Numbers

**As you work through the tutorial, complete the following statements and questions.**

1. How many people will Dijit's original pepperoni pizza recipe serve? _____

2. What fraction of a cup does the blue measuring cup hold? _____

3. Write the fraction that tells how much of the tub of pizza dough Dijit is not going to use. _____

4. Dividing by 3 is the same as multiplying by what number? _____

5. Write the mixed number $1\frac{1}{3}$ as an improper fraction in lowest terms. _____

6. According to the Earth Guide, how do you multiply fractions?

   _____

   _____

7. Is $\frac{1}{3}$ of $\frac{4}{3}$ equal to $\frac{1}{2}$? _____ Explain. _____

   _____

8. Use Dijit's number line to find out about how many $\frac{1}{4}$ - cup measures are needed to make approximately $\frac{7}{9}$ of a cup of sauce.

   _____

**Key Words:**
Proper fraction
Mixed number
Numerator
Denominator
Lowest terms
Multiply

**Learning Objectives:**

- Writing fractions in lowest terms
- Multiplying proper fractions and whole numbers
- Multiplying proper fractions and mixed numbers
- Multiplying fractions by multiplying numerators together and denominators together
- Using a number line to compare fractions

Name _____ Date _____

COURSE: **MSC IV**
MODULE 1: **Fractions**
UNIT 3: **Multiplying Fractions**

# Finding Products of Fractions, Whole Numbers, & Mixed Numbers


1. A group of hikers planned to walk $\frac{6}{9}$ of Grizzly's Trail. They planned to hike the remaining $\frac{3}{9}$ of the trail another day. Write $\frac{3}{9}$ as a fraction in lowest terms. _____

2. On another day, the hikers walked a trail that was 7 miles long. They walked $\frac{2}{3}$ of the trail before they stopped for water. How many miles did they walk before stopping?

   _____

3. Mary and Dijit are sharing a meal, and Dijit plans to serve $1\frac{3}{4}$ cups of berries. If the cups of berries are divided equally, how many cups will each get? _____

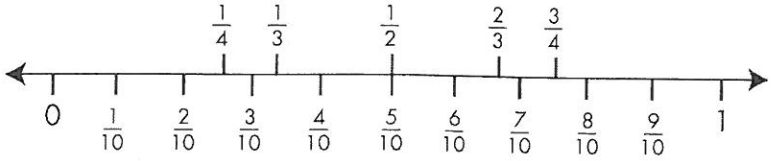
4. Mary brings $\frac{3}{4}$ of a pint of ice cream to the meal, and eats $\frac{1}{3}$ of the pint. What fraction of the pint in lowest terms does Mary eat? _____

5. Dijit has $2\frac{1}{2}$ quarts of milk. Dijit drinks $\frac{3}{10}$ of the milk. What fraction of a quart, in lowest terms, did he drink? _____

6. Mary wants $\frac{7}{10}$ of a cup of chocolate sauce. Which of the four measuring cups (1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$) could she use to best approximate the amount of sauce she wants? (Use the number line below as a guide.)

   _____

   _____



Name _____ Date _____ Class _____

LESSON 5-8

# Practice A

## *Dividing Fractions and Mixed Numbers*

**Find the reciprocal.**

1. $\frac{1}{2}$ _____

2. $\frac{2}{3}$ _____

3. $\frac{1}{5}$ _____

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

5. $\frac{3}{5}$ _____

6. $1\frac{1}{4}$ _____

7. $\frac{2}{5}$ _____

8. $\frac{3}{7}$ _____

9. $1\frac{1}{2}$ _____

**Divide. Write each answer in simplest form.**

10. $\frac{2}{3} \div 2$

$\frac{2}{3} \cdot$ _____

_____

11. $\frac{1}{2} \div \frac{3}{4}$

$\frac{1}{2} \cdot$ _____

_____

12. $\frac{5}{6} \div \frac{1}{4}$

$\frac{5}{6} \cdot$ _____

_____

13. $\frac{3}{5} \div \frac{1}{5}$

$\frac{3}{5} \cdot$ _____

_____

14. $\frac{7}{9} \div 3$

$\frac{7}{9} \cdot$ _____

_____

15. $1\frac{1}{2} \div \frac{1}{2}$

$1\frac{1}{2} \cdot$ _____

_____

16. Stella has 6 pounds of chocolate. She will use $\frac{2}{3}$ pound of the chocolate to make one cake. How many cakes can she make?

_____

17. Todd has $\frac{8}{9}$ pound of clay. He will use $\frac{1}{3}$ pound to make each action figure. How many action figures can he make?

_____

18. Dylan gives his two guinea pigs a total of $\frac{3}{4}$ cup of food every day. If each guinea pig gets the same amount of food, how much do they each get each day?

_____

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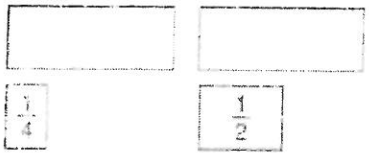
Lesson 5-8

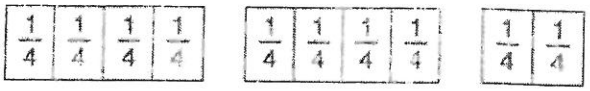
# Reading Strategies

## *Using Models*

Fraction bars help you picture dividing by fractions.




In the problem $2\frac{1}{2} \div \frac{1}{4}$, think: How many one-fourths are there in $2\frac{1}{2}$?

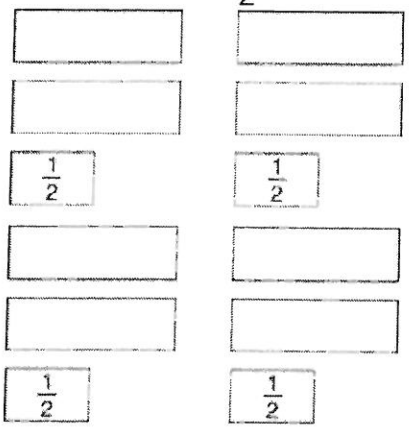



**Use the picture to answer each question.**

1. Count the number of $\frac{1}{4}$'s in the fraction bars above. How many are there? _____

2. $2\frac{1}{2} \div \frac{1}{4} =$ _____

In the problem $2\frac{1}{2} \times 4$, think $2\frac{1}{2}$ four times.




**Use the picture to answer each question.**

3. How many whole fraction bars are there? _____

4. How many one-half fraction bars are there? _____

5. When you add the whole bars and half bars together you get _____ whole bars.

6. Compare the multiplication and division examples. What do you notice about the answer you get when you divide by $\frac{1}{4}$ or multiply by 4?

_____

Name _____ Date _____ Class _____

LESSON 5-8

# Review for Mastery

## *Dividing Fractions and Mixed Numbers*

Two numbers are reciprocals if their product is 1. $\frac{2}{3}$ and $\frac{3}{2}$ are reciprocals because $\frac{2}{3} \cdot \frac{3}{2} = \frac{6}{6} = 1$.

Dividing by a number is the same as multiplying by its reciprocal.

$\frac{1}{4} \div 2 = \frac{1}{8}$ $\qquad$ $\frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8}$

So, you can use reciprocals to divide by fractions.

To find $\frac{2}{3} \div 4$, first rewrite the expression as a multiplication expression using the reciprocal of the divisor, 4.

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

Then use canceling to find the product in simplest form.

$\frac{2}{3} \div 4 = \frac{2}{3} \cdot \frac{1}{4} = \frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$

To find $3\frac{1}{4} \div 1\frac{1}{2}$, first rewrite the expression using improper fractions.

$\frac{13}{4} \div \frac{3}{2}$

Next, write the expression as a multiplication expression.

$\frac{13}{4} \cdot \frac{2}{3}$

$3\frac{1}{4} \div 1\frac{1}{2} = \frac{13}{4} \div \frac{3}{2} = \frac{13}{4} \cdot \frac{2}{3} = \frac{13}{2} \cdot \frac{1}{3} = \frac{13}{6} = 2\frac{1}{6}$

**Divide. Write each answer in simplest form.**

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

$\frac{1}{4} \div \frac{}{1}$

$\frac{\_\_\_\_}{\_\_\_\_} \cdot \frac{\_\_\_\_}{\_\_\_\_}$

$\_\_\_\_\_$

2. $1\frac{1}{2} \div 1\frac{1}{4}$

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

$\frac{\_\_\_\_}{\_\_\_\_} \cdot \frac{\_\_\_\_}{\_\_\_\_}$

$\_\_\_\_\_$

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

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

$\frac{\_\_\_\_}{\_\_\_\_} \cdot \frac{\_\_\_\_}{\_\_\_\_}$

$\_\_\_\_\_$

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

$\frac{}{3} \div \frac{}{4}$

$\frac{\_\_\_\_}{\_\_\_\_} \cdot \frac{\_\_\_\_}{\_\_\_\_}$

$\_\_\_\_\_$

5. $\frac{1}{5} \div 2$

$\_\_\_\_\_$

6. $1\frac{1}{6} \div 2\frac{2}{3}$

$\_\_\_\_\_$

7. $\frac{1}{8} \div 4$

$\_\_\_\_\_$

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

$\_\_\_\_\_$

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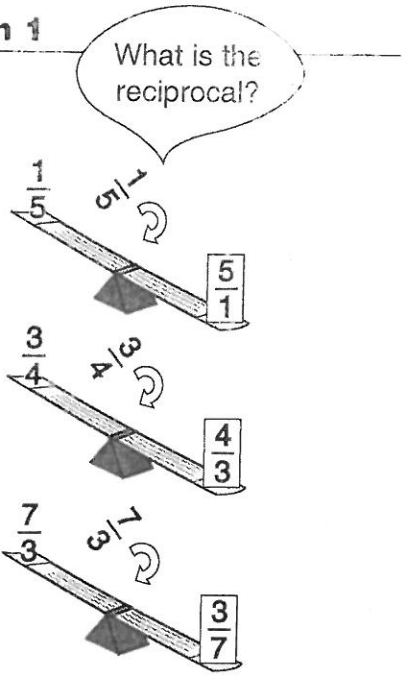
LESSON 5-8

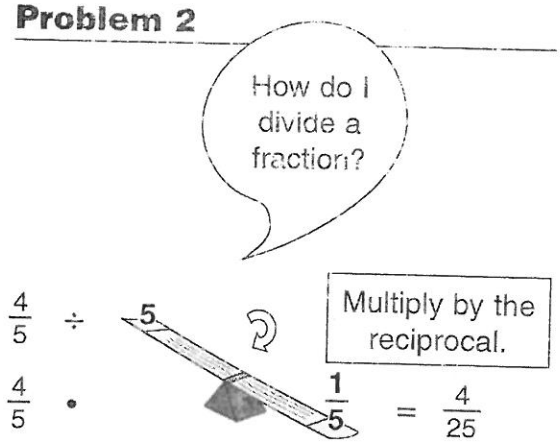
# Student Worksheet

## *Dividing Fractions and Mixed Numbers*

### Problem 1




### Problem 2




$\frac{4}{5} \div \frac{1}{5} = \frac{4}{5} \cdot 5 = \frac{4}{25}$

## Think and Discuss

1. How do you find the reciprocal of a fraction?

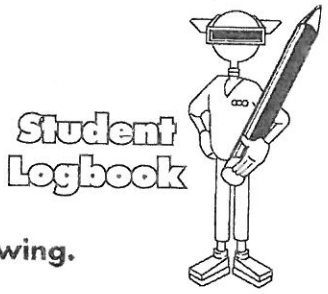
2. Explain the steps you follow to divide $2\frac{1}{3}$ by $\frac{1}{3}$.

3. What is the product of any given fraction times its reciprocal?

Name _____ Date _____

COURSE: **MSC III**
MODULE 3: **Fractions**
UNIT 3: **Multiplication and Division**

# Quotients and Remainders




**As you work through the tutorial, complete the following.**

**1.** What is your mission for this lesson? _____

_____

**2.** If the dividend stays the same, as the divisor decreases, the the _____ increases.

**3.** The equation $6 \div 3 = 2$ tells us there are _____ threes in _____ .

**4.** Since there are 2 halves in 1, there are _____ halves in 6. So, 6 divided by $\frac{1}{2}$ is _____ .

**5.** Since there are 3 thirds in 1, there are _____ thirds in 6. So, 6 divided by $\frac{1}{3}$ is _____ .

**6.** What is the quotient of 6 and $\frac{1}{5}$ ? _____

**7.** In these division problems, as the divisors decrease from $\frac{1}{2}$, to $\frac{1}{3}$, to $\frac{1}{5}$, (increase, decrease) the quotients (increase, decrease). Circle your answer.

**8.** Complete each pair of equivalent expressions.

**a.** $6 \div \frac{1}{2} =$ _____ $\div 6 \times$ _____ = _____
**b.** $6 \div \frac{1}{3} =$ _____ $\div 6 \times$ _____ = _____
**c.** $6 \div \frac{1}{5} =$ _____ $\div 6 \times$ _____ = _____

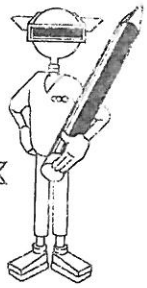
**9.** Dividing a number by a fraction is the same as multiplying the number and that fraction turned _____ _____ .
So, $4 \div$ _____ $= 24$, and $4 \times$ _____ $= 24$.

**Key Words:**
Numerator
Denominator
Reciprocal

**Learning Objectives:**

- Divide a whole number by a proper fraction.
- Estimate the quotient of two mixed numbers or improper fractions.
- Divide two mixed numbers or improper fractions.

Name _____ Date _____




**10.** If the product of two numbers is 1, the numbers are called _____.

**11.** To divide a number by a fraction, multiply the number by the _____ of the fraction.

**12. a.** In the expression $6 \div \frac{2}{3}$, What is the reciprocal of $\frac{2}{3}$? _____

**b.** Write $6 \div \frac{2}{3}$ as the product of 6 and the reciprocal of $\frac{2}{3}$. _____ × _____

**c.** What is $6 \div \frac{2}{3}$? _____.

**13.** Help Dijit estimate the quotient of $1\frac{2}{3} \div \frac{8}{9}$.

**a.** What is $1\frac{2}{3}$ rounded to the nearest whole number? _____
**b.** What is $\frac{8}{9}$ rounded to the nearest whole number? _____
**c.** The quotient of $1\frac{2}{3}$ and $\frac{8}{9}$ is approximately _____.

**14.** Now help Dijit find the quotient of $1\frac{2}{3} \div \frac{8}{9}$.

**a.** Express $1\frac{2}{3}$ as an improper fraction in lowest terms. _____
**b.** Write $\frac{5}{3} \div \frac{8}{9}$ as the product of two factors. Then find the product.
_____ × _____ = _____
**c.** The product is _____, so $\frac{5}{3} \div \frac{8}{9}$ is _____.
**d.** Express the answer in part (c) as an improper fraction in lowest terms. _____
**e.** What mixed number is equal to the fraction in part (d)? _____

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COURSE: **MSC III**
MODULE 3: **Fractions**
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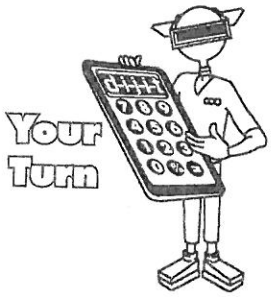
# Quotients and Remainders




**1.** Complete each pair of equivalent expressions.

**a.** $6 \div \frac{1}{8} =$ _____ $\div 6 \times$ _____ $=$ _____

**b.** $5 \div \frac{1}{7} =$ _____ $\div 5 \times$ _____ $=$ _____

**c.** $8 \div \frac{12}{1} =$ _____ $\div 8 \times$ _____ $=$ _____

**2.** A seamstress has 7 yards of fabric that she cuts into pieces that are $\frac{1}{3}$ yard long.

**a.** What expression can you write to find how many $\frac{1}{3}$-yard pieces she will have? _____

**b.** What is the reciprocal of the divisor? _____

**c.** How many $\frac{1}{3}$-yard pieces does she have? _____

**3.** Complete each division. Write your answers in lowest terms.

**a.** $4 \div \frac{2}{5} =$ _____

**b.** $15 \div \frac{5}{8} =$ _____

**c.** $9 \div \frac{2}{3} =$ _____

**d.** $11 \div \frac{3}{4} =$ _____

**4.** Complete each division. Write your answers in lowest terms.

**a.** $4\frac{1}{2} \div \frac{3}{8} =$ _____

**b.** $1\frac{5}{6} \div \frac{4}{9} =$ _____

**c.** $6\frac{2}{3} \div 2\frac{1}{2} =$ _____

**d.** $9\frac{3}{4} \div \frac{3}{5} =$ _____

Name _____ Date _____


5. Mr. Keys picks $12\frac{3}{8}$ pounds of beans from his garden. He divides the beans into bags that each weigh $2\frac{3}{4}$ pounds.

   **a.** What expression can you write to show how many bags Mr. Keys has. _____

   **b.** Round $12\frac{3}{8}$ and $2\frac{3}{4}$ to the nearest whole number and estimate the number of bags Mr. Keys has. _____

   **c.** How many bags of beans does Mr. Keys actually have? _____

   **d.** Are there any beans left over? _____ If so, how much do the leftover beans weigh? _____

6. A chemist divides $5\frac{1}{4}$ grams of a powder into containers that each hold $\frac{7}{8}$ grams.

   How many containers does the chemist fill? _____
   Show your work.