Name _____

Reteaching
6-1

Greatest Common Factor

The greatest number that divides into two numbers is the greatest common factor (GCF) of the two numbers. Here are two ways to find the GCF of 12 and 40.

List the Factors

Step 1: List the factors of each number.

12: 1, 2, 3, 4, 6, 12

40: 1, 2, 4, 5, 8, 10, 20, 40

Step 2: Circle the factors that are common to both numbers.

12: 1, (2), 3, (4), 6, 12

40: 1, (2), (4), 5, 8, 10, 20, 40

Step 3: Choose the greatest factor that is common to both numbers. Both 2 and 4 are common factors, but 4 is greater.

The GCF is 4.

Use Prime Factorization

Step 1: Write the prime factorization of each number.

12: $2 \times 2 \times 3$

40: $2 \times 2 \times 2 \times 5$

Step 2: Circle the prime factors that the numbers have in common.

12: $(2 \times 2) \times 3$

40: $(2 \times 2) \times 2 \times 5$

Step 3: Multiply the common factors.

$2 \times 2 = 4$ The GCF is 4.

Find the GCF for each set of numbers.

1. 10, 70 **10**
2. 4, 20 **4**
3. 18, 24 **6**
4. 18, 63 **9**
5. 17, 31 **1**
6. 14, 28 **14**

7. **Number Sense** Name two numbers that have a greatest common factor of 8.
   Sample answer: 16 and 24

8. **Geometry** Al's garden is 18 feet long and 30 feet wide. He wants to put fence posts the same distance apart along both the length and width of the fence. What is the greatest distance apart he can put the fence posts?
   6 feet

Name _____

Practice
6-1

Greatest Common Factor

Find the GCF for each set of numbers.

1. 12, 48 **12**
2. 20, 24 **4**
3. 19, 22 **1**
4. 24, 100 **4**
5. 18, 130 **2**
6. 200, 205 **5**

7. **Number Sense** Name three pairs of numbers that have 5 as their greatest common factor. Use each number only once in your answer.

Sample answer: 5, 10; 25, 30; 50, 55

8. The bake-sale committee divided each type of item evenly onto plates, so that every plate contained only one type of item and every plate had exactly the same number of items with no leftovers. What is the maximum number of items that could have been placed on each plate?

12

Bake Sale Donations	
Muffins	96
Bread sticks	48
Rolls	84

9. Using this system, how many plates of rolls could the bake-sale committee make? **7**

10. Using this system, how many plates of muffins could the bake-sale committee make? **8**

11. Which of the following pairs of numbers is correctly listed with its greatest common factor?

(A) 20, 24; GCF: 4

B 50, 100; GCF: 25

C 4, 6; GCF: 24

D 15, 20; GCF: 10

12. **Writing to Explain** Explain one method of finding the greatest common factor of 48 and 84.

Sample answer: You can use prime factorization to find the GCF of 48 and 84 by multiplying their common prime factors: $2 \times 2 \times 3 = 12$.

Name _____

Enrichment
6-1

Factor Fiction

1. Complete the table below. For each square, write a number that fits both the rule of the row and the rule of the column. Do not use any number more than once. **Reasoning**

Sample answers are given.

	Is a multiple of 3	Is a factor of 3,960	Uses the same digit twice	Sum of its digits is 12
Is divisible by 6	18	12	66	84
Is less than 40	27	33	22	39
Is a multiple of 5	45	40	55	75
Is an odd number	21	11	77	147

Write *True* or *False* for each of these statements about greatest common factors. If the statement is false, explain why the statement is wrong and give an example.

2. A pair of numbers each greater than 100 will always have a greater GCF than a pair of numbers that are both less than 100.

False; The size of the GCF is not dependent on the size of the numbers. For example, 110 and 130 have a GCF of 10, while 15 and 30 have a GCF of 15.

3. The GCF of a pair of numbers is always equal to or less than the lesser of the two numbers.

True

4. The GCF of a pair of numbers can never be equal to one of the numbers.

False. The GCF can be equal to the lesser number. The GCF of 30 and 15 is 15.

Name _____

Reteaching
6-2

Least Common Multiple

There are different ways to find the least common multiple (LCM) of two numbers. Here are two ways of finding the LCM of 4 and 5:

List Multiples

Step 1: List multiples of each number.

4: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48...

5: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50...

Step 2: Check the multiples the numbers have in common.

4: 4, 8, 12, 16, (20), 24, 28, 32, 36, (40), 44, 48...

5: 5, 10, 15, (20), 25, 30, 35, (40), 45, 50...

Step 3: Determine which of the common multiples is the least.

20 and 40 are both common multiples, but 20 is the least.

The LCM of 4 and 5 is 20.

Use Prime Factors

Step 1: List the prime factors of each number.

4: 2×2

5: 5

Step 2: Circle the greatest number of times each different factor appears.

4: (2×2)

5: (5)

Step 3: Find the product of the factors you circled.

$2 \times 2 \times 5 = 20$

The LCM of 4 and 5 is 20.

Find the LCM of each set of numbers.

1. 6, 7	42	**2.** 4, 5	20	**3.** 10, 11	110
4. 2, 5	10	**5.** 6, 11	66	**6.** 8, 10	40
7. 3, 10	30	**8.** 5, 10	10	**9.** 7, 8	56

10. Number Sense If you know the LCM of 4 and 5, how could you find the LCM of 40 and 50?

Multiply the LCM of 4 and 5 by 10.

11. Writing to Explain Peter says the least common multiple of 4 and 6 is 24. Do you agree or disagree? Explain.

Disagree; Sample explanation: $4 \times 3 = 12$ and $6 \times 2 = 12$. So, the LCM is 12.

Name _____

Practice
6-2

Least Common Multiple

Find the LCM of each set of numbers.

1. 5, 9	45	**2.** 4, 10	20	**3.** 8, 12	24
4. 7, 12	84	**5.** 4, 11	44	**6.** 3, 7	21
7. 7, 8	56	**8.** 6, 9	18	**9.** 3, 12	12

10. At what times of the day between 10:00 A.M. and 5:00 P.M. do the chemistry presentation and the recycling presentation start at the same time?

10:30 A.M., 11:00 A.M., 11:30 A.M., 12:00 P.M., 12:30 P.M., 1:00 P.M., 1:30 P.M., 2:00 P.M., 2:30 P.M., 3:00 P.M., 3:30 P.M., 4:00 P.M., 4:30 P.M.

Science Museum
— Show Schedule —
Chemistry — Every 10 minutes
Electricity — Every 20 minutes
Recycling — Every 6 minutes
Fossils — Every 45 minutes
The first showing for all shows is at 10:00 A.M.

11. The museum does shows in schools every Monday and shows in public libraries every fifth day (on both weekdays and weekends). If the museum did both a school show and a library show on Monday, how many days will it be until it does both shows on the same day again?

35 days

12. Which of the following pairs of numbers is correctly listed with its LCM?

A 5, 10; LCM: 50

(**B**) 2, 3; LCM: 6

C 2, 6; LCM: 12

D 7, 9; LCM: 21

13. **Writing to Explain** What method would you use to find the LCM of a group of four numbers? Explain and give an example.

Sample answer: prime factorization; To find the LCM of 3, 6, 8, and 10, multiply the greatest number of times each factor appears in each prime factorization: $2^3 \times 3 \times 5 = 120$.

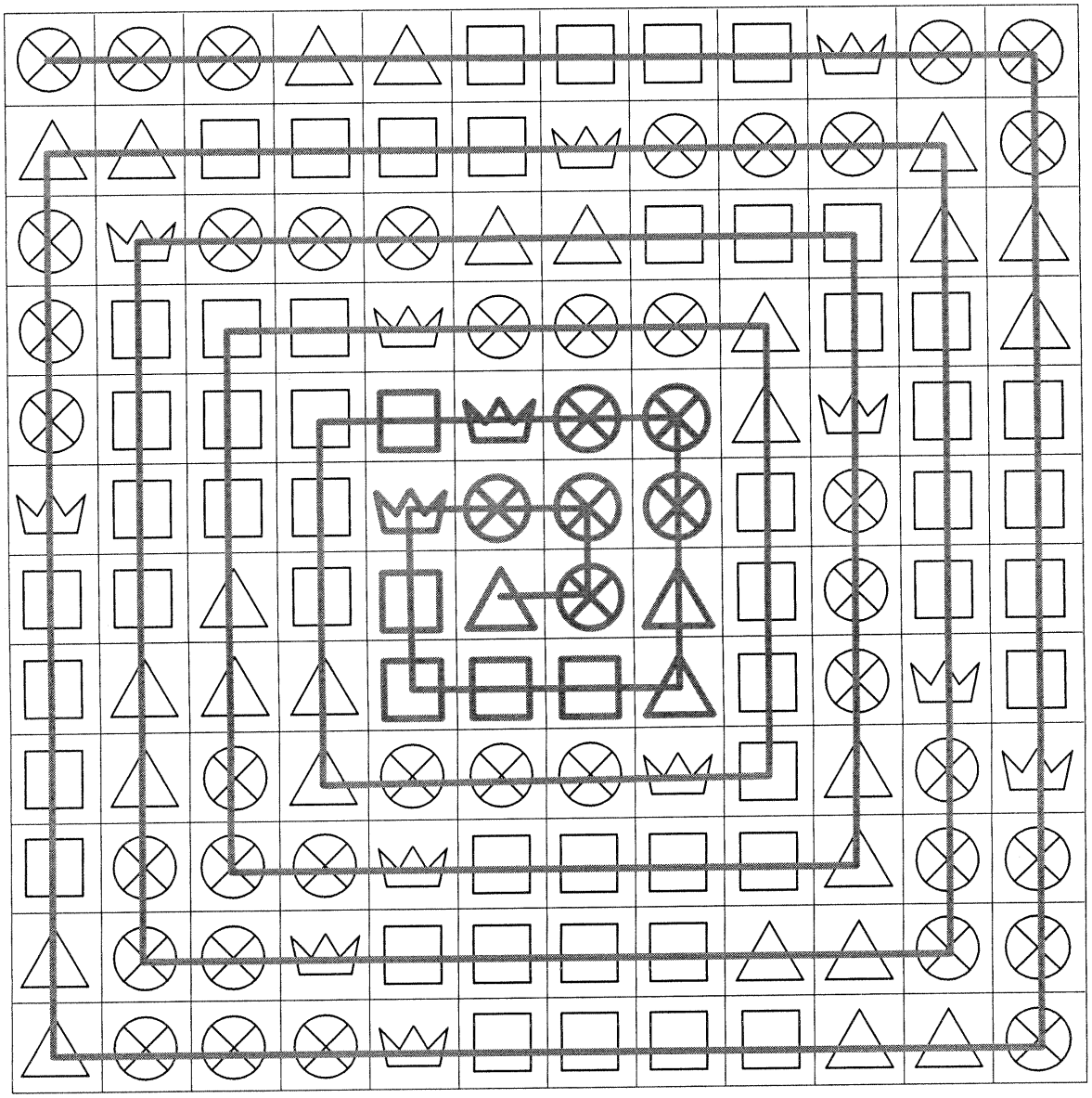
Name _____

Enrichment
6-2

What's the Pattern?

Patterns

Look at the shapes in the grid to find the pattern. Then complete the missing section in the center.



Name _____

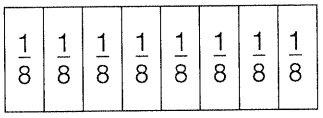
Reteaching
6-3

Understanding Division of Fractions

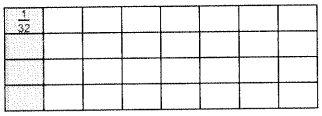
Divide a fraction by a whole number.

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

Use a model to show $\frac{1}{8}$.



Divide each eighth into 4 equal parts.



Each section shows $\frac{1}{(8 \times 4)} = \frac{1}{32}$.

$\frac{1}{8} \div 4 = \frac{1}{32}$.

Solve each division sentence. Use a model to help.

1. $3 \div \frac{1}{3} =$ 9
2. $\frac{1}{5} \div 4 =$ $\frac{1}{20}$
3. $16 \div \frac{1}{4} =$ 64
4. $\frac{1}{7} \div 8 =$ $\frac{1}{56}$

Find each quotient. Use a model if you wish. Simplify if possible.

5. $3 \div \frac{1}{2} =$ 6
6. $\frac{9}{10} \div 10 =$ $\frac{9}{100}$
7. $\frac{1}{5} \div 3 =$ $\frac{1}{15}$
8. $\frac{3}{16} \div 2 =$ $\frac{3}{32}$
9. $5 \div \frac{1}{3} =$ 15
10. $\frac{1}{2} \div 6 =$ $\frac{1}{12}$
11. $8 \div \frac{1}{4} =$ 32
12. $\frac{7}{12} \div 4 =$ $\frac{7}{48}$
13. $\frac{6}{7} \div 7 =$ $\frac{6}{49}$

14. **Draw a Picture** The square dancing club meets for 3 hours. Every $\frac{3}{4}$ hour, the dancers change partners. How many different partners will each dancer have in one meeting? Draw a picture to show your solution.

$3 \div \frac{3}{4} = 4$; 4 partners. Check students' drawings.

15. **Writing to Explain** Explain why the quotient of two fractions less than 1 is always greater than either fraction.

The quotient is always greater than the fractions because you are dividing by a number less than one.

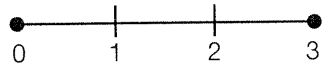
Name _____

Practice
6-3

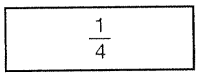
Understanding Division of Fractions

Solve each division sentence using the models provided.

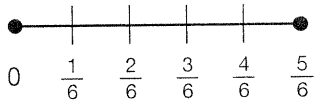
1. $3 \div \frac{1}{3} =$ 9



2. $\frac{1}{4} \div 6 =$ $\frac{1}{24}$



3. $\frac{5}{6} \div 6 =$ $\frac{5}{36}$



Find each quotient. You can make a model to help. Simplify if possible.

4. $8 \div \frac{1}{4} =$ 32

5. $\frac{1}{7} \div 4 =$ $\frac{1}{28}$

6. $5 \div \frac{1}{2} =$ 10

7. $\frac{7}{8} \div 8 =$ $\frac{7}{64}$

8. $\frac{11}{12} \div 12 =$ $\frac{11}{144}$

9. $\frac{1}{12} \div 3 =$ $\frac{1}{36}$

10. $6 \div \frac{2}{3} =$ 9

11. $7 \div \frac{1}{3} =$ 21

12. $\frac{15}{16} \div \frac{1}{16} =$ 15

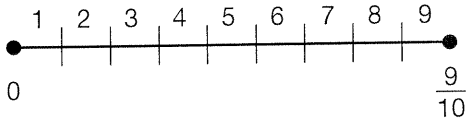
13. **Draw a Picture** Olivia has a piece of ribbon $\frac{1}{2}$ yard long. If she cuts it into 6 equal pieces, what will be the length of each piece, in yards?

Check students pictures: $\frac{1}{12}$ yard

14. **Geometry** A regular polygon has a perimeter of 12 units. If each side measures $\frac{3}{4}$ unit, how many sides does the polygon have?

16

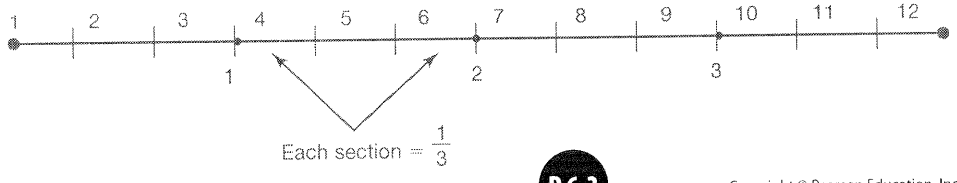
15. Which division expression is shown by this model?



(A) $\frac{9}{10} \div \frac{1}{10}$ B $1 \div \frac{1}{10}$ C $\frac{9}{10} \div 1$ D $10 \div \frac{9}{10}$

16. **Writing to Explain** When you divide a whole number by a fraction less than 1, will the quotient be greater than or less than the whole number? Explain, and give an example.

The quotient will be greater because you are dividing by a number less than 1. $4 \div \frac{1}{3} = 12$: There are more fraction parts than wholes.



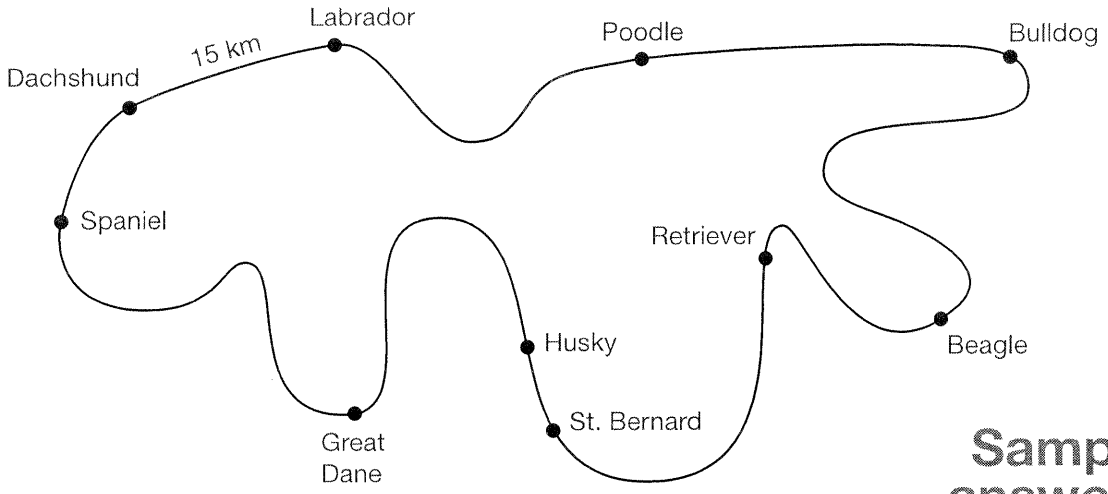
Name _____

Enrichment
6-3

Canine County

Estimation

Look at the map of Canine County below. The road from Dachshund to Labrador is 15 km. Use this information and the map to answer the questions.



Sample answers are given.

1. The road that connects Dachshund and Labrador is about the same length as the road between which two towns?

   Retriever and Beagle

2. Which two towns are about 32 km apart?

   Spaniel and Great Dane

3. About how many times as long as the road from Dachshund to Labrador is the road between Labrador and Poodle?

   About 2 times

4. Which two towns are about four times as far apart as Husky and St. Bernard?

   Bulldog and Poodle

5. Between which two towns is the road about $2\frac{1}{2}$ times as long as the road from Dachshund to Spaniel?

   Great Dane and Husky

6. The bicycle warehouse is about $\frac{1}{4}$ of the way from Bulldog to Beagle. About how many kilometers would a truck drive to bring a load of bicycles to a store in Husky?

   About 80 km

Name _____

Reteaching
6-4

Dividing Whole Numbers by Fractions

To divide a whole number by a fraction, you can multiply the whole number by the reciprocal of the fraction. The reciprocal of a number has the numerator and the denominator reversed. The product of a number and its reciprocal is 1.

Number	×	Reciprocal	=	Product
3	×	$\frac{1}{3}$	=	1
$\frac{1}{8}$	×	$\frac{8}{1}$	=	1
$\frac{2}{3}$	×	$\frac{3}{2}$	=	1

Find $14 \div \frac{4}{7}$.

Step 1

Rewrite the division as multiplication using the reciprocal of the divisor.

The reciprocal of $\frac{4}{7}$ is $\frac{7}{4}$.

$14 \div \frac{4}{7} = 14 \times \frac{7}{4}$

Step 2

Divide out common factors if possible. Then multiply.

$\frac{\cancel{14}^{7}}{1} \times \frac{7}{\cancel{4}_{2}} = \frac{49}{2}$

Step 3

If your answer is an improper fraction, change it to a mixed number.

$\frac{49}{2} = 24\frac{1}{2}$

Find the reciprocal of each fraction or whole number.

1. $\frac{5}{7}$ $\frac{7}{5}$ **2.** 11 $\frac{1}{11}$ **3.** $\frac{9}{2}$ $\frac{2}{9}$

Find each quotient. Simplify if possible.

4. $12 \div \frac{4}{5}$ 15 **5.** $2 \div \frac{1}{4}$ 8 **6.** $16 \div \frac{8}{10}$ 20

7. $24 \div \frac{3}{4}$ 32 **8.** $18 \div \frac{8}{9}$ $20\frac{1}{4}$ **9.** $25 \div \frac{10}{11}$ $27\frac{1}{2}$

10. $36 \div \frac{8}{9}$ $40\frac{1}{2}$ **11.** $42 \div \frac{7}{8}$ 48 **12.** $40 \div \frac{4}{5}$ 50

13. Karolyn makes rolls for a friend's dinner party. She uses 3 lb of butter. Each stick of butter weighs $\frac{1}{4}$ lb. How many sticks of butter does Karolyn need to make her rolls?

12 sticks

Name _____

Practice
6-4

Dividing Whole Numbers by Fractions

Find the reciprocal of each fraction or whole number.

1. $\frac{5}{9}$ $\frac{9}{5}$
2. 8 $\frac{1}{8}$
3. $\frac{7}{3}$ $\frac{3}{7}$

Find each quotient. Simplify if possible.

4. $8 \div \frac{2}{5} =$ 20
5. $4 \div \frac{1}{6} =$ 24
6. $18 \div \frac{3}{8} =$ 48
7. $12 \div \frac{1}{2} =$ 24
8. $42 \div \frac{7}{9} =$ 54
9. $10 \div \frac{5}{6} =$ 12
10. $20 \div \frac{3}{4} =$ $26\frac{2}{3}$
11. $22 \div \frac{5}{6} =$ $26\frac{2}{5}$
12. $7 \div \frac{2}{3} =$ $10\frac{1}{2}$
13. $9 \div \frac{1}{8} =$ 72
14. $15 \div \frac{1}{3} =$ 45
15. $6 \div \frac{1}{5} =$ 30

16. **Writing to Explain** Will the quotient of $5 \div \frac{7}{8}$ be greater than or less than 5? Explain.

The quotient will be greater than 5 because you are dividing by a number that is less than 1.

17. **Reasoning** How many times will you need to fill a $\frac{1}{2}$ cup measuring cup to measure 4 cups of flour?

8

18. **Geometry** The distance around a circular flower bed is 36 feet. Jasper wants to put stakes every 8 inches ($\frac{2}{3}$ of a foot) around the bed. How many stakes does he need?

54 stakes

19. **Algebra** Which expression is equal to $9 \times \frac{3}{2}$?

A $2 \div \frac{3}{9}$

B $3 \div \frac{9}{2}$

(C) $9 \div \frac{2}{3}$

D $9 \div \frac{3}{2}$

Name _____

Enrichment
6-4

What's the Fraction Pattern?

Patterns

The fractions in the chart form a pattern.

1. Complete the chart.

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{1}{7}$	$\frac{1}{8}$	$\frac{1}{9}$
1	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{1}{3}$	$\frac{2}{7}$	$\frac{1}{4}$	$\frac{2}{9}$
$1\frac{1}{2}$	1	$\frac{3}{4}$	$\frac{3}{5}$	$\frac{1}{2}$	$\frac{3}{7}$	$\frac{3}{8}$	$\frac{1}{3}$
2	$1\frac{1}{3}$	1	$\frac{4}{5}$	$\frac{2}{3}$	$\frac{4}{7}$	$\frac{1}{2}$	$\frac{4}{9}$
$2\frac{1}{2}$	$1\frac{2}{3}$	$1\frac{1}{4}$	1	$\frac{5}{6}$	$\frac{5}{7}$	$\frac{5}{8}$	$\frac{5}{9}$

2. Describe the pattern.

Fractions in the 1st row are multiplied by 2 to get the numbers in the 2nd row, by 3 to get the numbers in the 3rd row, by 4 to get the numbers in the 4th row, and by 5 to get the numbers in the 5th row.

3. How would you find the numbers in the 100th row of this pattern?

Multiply each fraction in the first row by 100.

Name _____

Reteaching
6-5

Modeling Division of Fractions

You can use fraction strips to divide fractions.

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

Use part of the strip for thirds to show $\frac{1}{3}$.

$\frac{1}{3}$

Then place the strip for sixths below the strip for thirds.

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

Count how many sixths are as long as the strip for $\frac{1}{3}$.

Two sixths are as long as $\frac{1}{3}$.
So, $\frac{1}{3} \div \frac{1}{6} = 2$.

Use the pictures of the fraction strips to find each quotient.

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

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

2. $\frac{3}{4} \div \frac{1}{12} =$ 9

$\frac{1}{4}$			$\frac{1}{4}$			$\frac{1}{4}$					
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

3. $\frac{4}{5} \div \frac{1}{10} =$ 8

$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$			
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

4. $\frac{1}{4} \div \frac{1}{8} =$ 2

$\frac{1}{4}$							
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

Find each quotient. You can use fraction strips to help.

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

6. $\frac{3}{5} \div \frac{1}{10} =$ 6

7. $\frac{1}{3} \div \frac{1}{12} =$ 4

8. Writing to Explain Why is the quotient of two fractions less than 1 always greater than either fraction? Explain.

The quotient is always greater than the fractions because you are dividing by a number less than one.

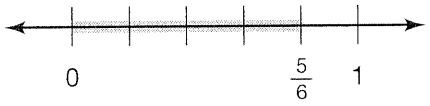
Name _____

Practice
6-5

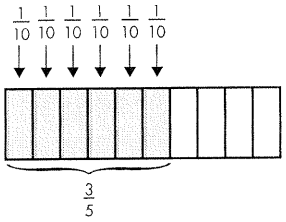
Modeling Division of Fractions

Solve each division sentence using the models provided.

1. $\frac{5}{6} \div \frac{1}{6} =$ 5



2. $\frac{3}{5} \div \frac{1}{10} =$ 6



Find each quotient. You can draw a model to help.

3. $\frac{6}{7} \div \frac{2}{7} =$ 3

4. $\frac{3}{4} \div \frac{1}{16} =$ 12

5. $\frac{7}{8} \div \frac{1}{8} =$ 7

6. $\frac{15}{16} \div \frac{1}{16} =$ 15

7. $\frac{11}{12} \div \frac{1}{12} =$ 11

8. $\frac{5}{8} \div \frac{5}{16} =$ 2

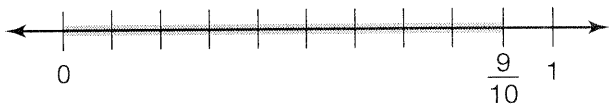
9. **Draw a Picture** Olivia has a piece of ribbon $\frac{1}{2}$ yard long. She will cut it into pieces that are each $\frac{1}{12}$ yard long. How many pieces will Olivia have?

Check students' pictures; 6 pieces

10. **Writing to Explain** Write an explanation for another student telling him or her how to divide $\frac{2}{3}$ by $\frac{1}{6}$.

Sample answer: Draw a rectangle that is divided into thirds. Shade two of the thirds. Since each third is equal to $\frac{2}{6}$, divide each third in half. Then count the number of sixths in the shaded part of the rectangle. There are 4 sixths. So $\frac{2}{3} \div \frac{1}{6} = 4$.

11. Which division expression is shown by the model?



(A) $\frac{9}{10} \div \frac{1}{10}$ B $1 \div \frac{9}{10}$ C $\frac{1}{10} \div \frac{9}{10}$ D $\frac{1}{10} \div \frac{1}{9}$

12. **Algebra** Which equation could you use to find the number of $\frac{1}{8}$-inch pieces that can be cut from a piece of string that is $\frac{3}{4}$ of an inch long?

A $\frac{1}{4} \times \frac{8}{5} = n$ B $\frac{1}{8} \div \frac{3}{4} = n$ C $\frac{5}{8} \times \frac{1}{4} = n$ (D) $\frac{3}{4} \div \frac{1}{8} = n$

Name _____

Enrichment
6-5

Make the Right Choice

Reasoning

In each of these problems, some numbers are missing. Read each problem. Then circle the letter of the correct way to solve the problem.

1. You are buying books at the bookstore. Each book you buy costs the same amount. You know how much money you started with and also how much you have already spent. How many books can you buy and still have enough for a set of bookends?

   (A) Add the cost of the bookends to what you have already spent. Subtract that amount from the amount of money you started with. Divide that number by the price of a book.

   B Subtract what you have already spent from the amount of money you started with. Add the cost of the bookends. Divide that answer by the price of a book.

   C Subtract the cost of the bookends from the amount of money you started with. Multiply that number by the price of a book.

2. You are making lasagna for your friends. You know how many people your recipe serves and the amount of each ingredient you need. More people will be eating than the recipe serves. How will you change the recipe to make enough?

   A Divide the recipe ingredients by the number of people who will be eating.

   B Multiply the amount of each ingredient by the number of people who will be eating.

   (C) Divide the number of people who will be eating by the number the recipe serves. Multiply that answer by the amount of each ingredient.

3. You know how many hours you have between the end of school and bedtime. You also know how many minutes you spend doing homework. How can you find what fraction of the time after school you spend doing homework?

   A Multiply to change the after-school time to minutes. Divide by the minutes of homework time.

   (B) Multiply to change the after-school time to minutes. Divide the number of minutes of homework time by that product.

   C Divide the hours of after-school time by the minutes of homework time.

Name _____

Reteaching
6-6

Dividing Fractions

To divide by a fraction, you can multiply by its reciprocal. The reciprocal of a number has the numerator and the denominator reversed.

Find $\frac{4}{5} \div \frac{3}{10}$.

Step 1

Rewrite the division as multiplication using the reciprocal of the divisor.

The reciprocal of $\frac{3}{10}$ is $\frac{10}{3}$.

$\frac{4}{5} \div \frac{3}{10} = \frac{4}{5} \times \frac{10}{3}$

Step 2

Divide out common factors if possible. Then multiply.

$\frac{\cancel{4}^{1}}{\cancel{5}_{1}} \times \frac{\cancel{10}^{2}}{3} = \frac{8}{3}$

Step 3

If your answer is an improper fraction, change it to a mixed number.

$\frac{8}{3} = 2\frac{2}{3}$

Find each quotient. Simplify if possible.

1. $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{\uparrow} = 2$
   Reciprocal of $\frac{1}{4}$

2. $\frac{4}{7} \div \frac{8}{21} = \frac{4}{7} \times \frac{21}{8} = 1\frac{1}{2}$
   Reciprocal of $\frac{8}{21}$

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

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

5. $\frac{5}{8} \div \frac{7}{10}$ $\frac{25}{28}$

6. $\frac{3}{7} \div 3$ $\frac{1}{7}$

7. $\frac{1}{3} \div \frac{8}{9}$ $\frac{3}{8}$

8. $\frac{5}{6} \div \frac{1}{8}$ $6\frac{2}{3}$

9. $\frac{5}{9} \div \frac{1}{2}$ $1\frac{1}{9}$

10. $\frac{3}{5} \div \frac{3}{4}$ $\frac{4}{5}$

11. $\frac{3}{4} \div \frac{5}{6}$ $\frac{9}{10}$

12. $\frac{9}{10} \div \frac{4}{5}$ $1\frac{1}{8}$

13. $\frac{1}{3} \div \frac{3}{8}$ $\frac{8}{9}$

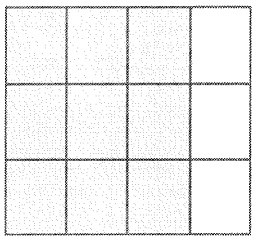
14. $\frac{4}{7} \div \frac{3}{4}$ $\frac{16}{21}$

15. Aaron has $\frac{7}{8}$ gallon of bottled water. How many $\frac{3}{16}$-gallon servings can he pour?

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

16. **Draw a Picture** Show how Rebecca can divide $\frac{3}{4}$ of a cake into 9 pieces. What fraction of the whole cake will each piece be?

Sample answer: Each piece is $\frac{1}{12}$ of the cake.



Name _____

Practice
6-6

Dividing Fractions

Find each quotient. Simplify if possible.

1. $\frac{1}{3} \div \frac{5}{6} =$ $\frac{2}{5}$
2. $\frac{3}{8} \div \frac{1}{2} =$ $\frac{3}{4}$
3. $\frac{7}{8} \div \frac{7}{12} =$ $1\frac{1}{2}$
4. $\frac{5}{9} \div 5 =$ $\frac{1}{9}$
5. $\frac{6}{7} \div \frac{3}{4} =$ $1\frac{1}{7}$
6. $\frac{2}{3} \div \frac{3}{4} =$ $\frac{8}{9}$
7. $\frac{1}{2} \div \frac{3}{10} =$ $1\frac{2}{3}$
8. $\frac{5}{12} \div \frac{2}{3} =$ $\frac{5}{8}$
9. $\frac{14}{15} \div \frac{2}{5} =$ $2\frac{1}{3}$
10. $\frac{1}{3} \div \frac{3}{4} =$ $\frac{4}{9}$
11. $\frac{3}{8} \div 4 =$ $\frac{3}{32}$
12. $\frac{9}{10} \div \frac{3}{5} =$ $1\frac{1}{2}$

13. **Writing to Explain** Serena said that by looking for common factors and simplifying the expression, she found that $\frac{4}{10} \div \frac{5}{8} = 1\frac{9}{16}$. Do you agree with Serena? Why or why not?

$$\frac{\overset{5}{\cancel{10}}}{4} \times \frac{5}{\underset{4}{\cancel{8}}} = \frac{25}{16} = 1\frac{9}{16}$$

No, Serena needs to use the reciprocal of the divisor, not the dividend, when she rewrites the expression as a multiplication expression: $\frac{4}{10} \div \frac{5}{8} = \frac{4}{10} \times \frac{8}{5}$, which can be simplified as $\frac{4}{5} \times \frac{4}{5} = \frac{16}{25}$.

14. A $\frac{5}{6}$-yard piece of fencing is made of boards that are $\frac{1}{12}$ yard wide. How many boards make up the fence?

10 boards

15. Nathan has $\frac{7}{8}$ lb of hummus. How many $\frac{3}{10}$-lb servings does he have?

$2\frac{11}{12}$ servings

16. **Algebra** Which equation can you use to find the number of $\frac{1}{4}$–inch pieces that can be cut from a piece of metal $\frac{5}{8}$ of an inch long?

(A) $\frac{5}{8} \div \frac{1}{4} = n$

B $\frac{1}{4} \div \frac{5}{8} = n$

C $\frac{5}{8} \times \frac{1}{4} = n$

D $\frac{1}{4} \times \frac{8}{5} = n$

Name _____

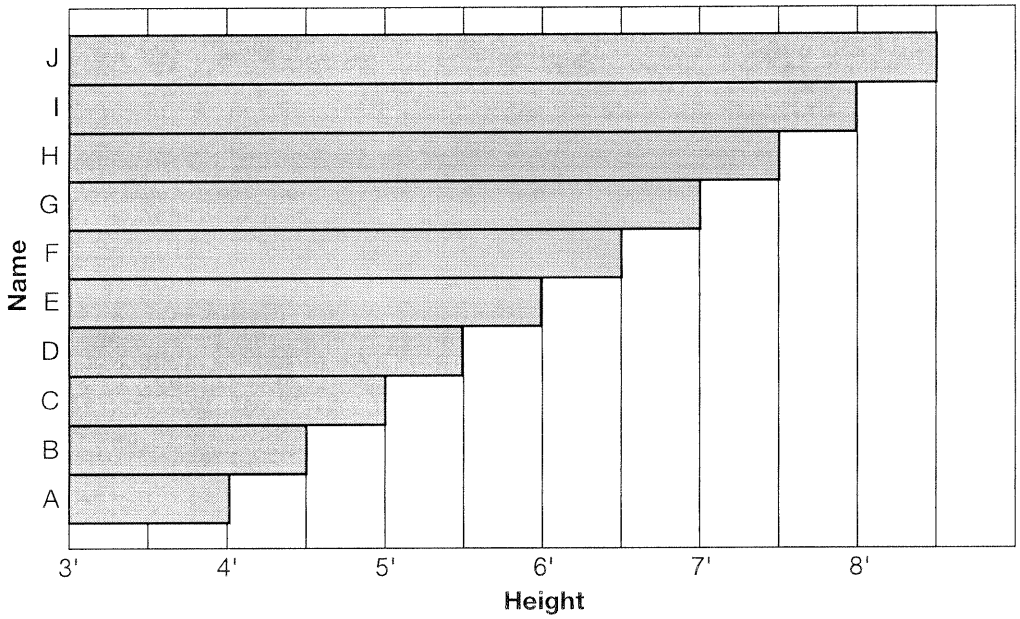
Enrichment
6-6

And the Winner Is . . .

Reasoning

Anita grew giant sunflowers from ten different kinds of seed. She named each patch for one of her favorite cousins. At the end of the summer, she graphed the height of the tallest flower from each patch. Answer the questions using the clues below.

The Tallest Sunflowers



Ed is taller than Ned. Ned is taller than Red. Red is taller than Ted. Al is taller than Red, but shorter than Ned. Ike's bar is between Sal's and Todd's. Todd is shorter than Ed, but taller than Ike. Van's bar is between Ed's and Ian's. Ian's bar is next to Todd's. There are seven bars between Van and Ted.

1. Which is the tallest? **Ed**

2. Which is 4 ft tall? **Ted**

3. What is the mean of the heights of the flowers? **6 ft 3 in.**

4. What is the median of the heights of the flowers? What is the name of the flower at the median height?

   6 ft 3 in.; No one had that height.

5. Which flowers represent bars B, C, H?

   Red, Al, Ian

Name _____

Reteaching
6-7

Estimating Mixed-Number Quotients

When you are working with fractions and mixed numbers, you can estimate using rounding and compatible numbers.

Estimate $23\frac{5}{6} \div 8\frac{3}{7}$.

$23\frac{5}{6} \div 8\frac{3}{7}$ — Round each mixed number to the nearest whole number.

$24 \div 8 = 3$ — Divide.

$23\frac{5}{6} \div 8\frac{3}{7} \approx 3$

Estimate $31\frac{1}{6} \div 4\frac{5}{8}$.

$31\frac{1}{6} \div 4\frac{5}{8}$ — Change $31\frac{1}{6}$ and $4\frac{5}{8}$ to the nearest compatible whole numbers.

$30 \div 5 = 6$ — Think: $31\frac{1}{6}$ and $4\frac{5}{8}$ are close to 30 and 5.

$31\frac{1}{6} \div 4\frac{5}{8} \approx 6$

Estimate each quotient. **Sample answers are shown.**

1. $11\frac{1}{2} \div 6\frac{1}{4}$ **2**
2. $19\frac{1}{3} \div 3\frac{2}{3}$ **5**
3. $41\frac{7}{9} \div 7\frac{1}{5}$ **6**
4. $35\frac{1}{8} \div 5\frac{4}{5}$ **6**
5. $61\frac{3}{8} \div 8\frac{5}{9}$ **7**
6. $72\frac{2}{9} \div 7\frac{7}{8}$ **9**
7. $86\frac{3}{4} \div 10\frac{5}{6}$ **8**
8. $26\frac{9}{10} \div 2\frac{5}{8}$ **9**
9. $11\frac{2}{7} \div 3\frac{3}{5}$ **3**
10. $7\frac{9}{10} \div 2\frac{3}{10}$ **4**
11. $47\frac{6}{10} \div 7\frac{1}{12}$ **7**
12. $60\frac{5}{12} \div 5\frac{4}{9}$ **10**

13. **Critical Thinking** Which of these two estimates is closer to the actual quotient? How do you know?

Lisa's estimate: $55\frac{1}{2} \div 6\frac{3}{4} \approx 54 \div 6 = 9$

Hayden's estimate: $55\frac{1}{2} \div 6\frac{3}{4} \approx 56 \div 7 = 8$

Sample answer: Hayden's estimate is closer because he used numbers closer to the original numbers.

14. Patrick uses wire to make wreaths. He has $31\frac{1}{2}$ feet of wire left on a spool. Estimate how many $3\frac{3}{4}$ pieces can he cut from the longer piece of wire.

Sample answer: About 8 pieces

Name _____

Practice
6-7

Estimating Mixed-Number Quotients

Estimate each product. **Sample answers are shown.**

1. $37\frac{1}{3} \div 5\frac{7}{8} =$ **6**
2. $25\frac{1}{2} \div 6\frac{1}{4} =$ **4**
3. $49\frac{4}{5} \div 6\frac{1}{2} =$ **7**
4. $12\frac{3}{4} \div 5\frac{5}{9} =$ **2**
5. $43\frac{2}{3} \div 5\frac{2}{5} =$ **9**
6. $8\frac{1}{3} \div 2\frac{9}{10} =$ **3**
7. $67\frac{1}{5} \div 7\frac{2}{7} =$ **10**
8. $55\frac{5}{9} \div 7\frac{1}{6} =$ **8**
9. $19\frac{6}{7} \div 4\frac{1}{8} =$ **5**
10. $71\frac{4}{5} \div 7\frac{8}{9} =$ **9**
11. $15\frac{7}{10} \div 3\frac{4}{9} =$ **4**
12. $79\frac{4}{7} \div 8\frac{5}{8} =$ **10**
13. $26\frac{1}{4} \div 2\frac{3}{8} =$ **13**
14. $40\frac{8}{9} \div 7\frac{3}{5} =$ **6**
15. $58\frac{1}{3} \div 19\frac{5}{6} =$ **3**

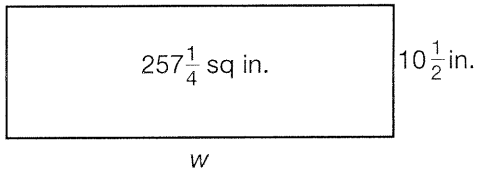
16. **Number Sense** Tran wants to cut strips of paper that are $2\frac{1}{4}$ in. wide. His sheet of paper is $11\frac{1}{2}$ in. wide. He estimates that $11\frac{1}{2} \div 2\frac{1}{4} = 6$, so he can cut 6 strips from each sheet of paper. Is his estimate an overestimate or an underestimate? Explain.

Sample answer: 6 is an overestimate because Tran rounded the width of the paper up and the width of the strips down.

17. **Writing to Explain** Eliza uses $2\frac{7}{8}$ feet of yarn in each gift basket she makes. Explain how to estimate how many baskets Eliza can make if she has 22 feet of yarn.

Sample answer: Divide 22 by $2\frac{7}{8}$. Use compatible numbers to estimate: $21 \div 3 = 7$, so she has enough yarn to make at least 7 gift baskets.

18. **Geometry** The area of this rectangle is $257\frac{1}{4}$ sq in. What is the best estimate of side length w? Remember, $A = \ell \times w$.



A 66,000 in.

B 50 in.

C 25 in.

D 5 in.

19. **Critical Thinking** What estimation method did you use to find the length of side w in Problem 18?

Sample answer: I used compatible numbers: $250 \div 10 = 25$.

Name _____

Enrichment
6-7

Where Shall I Sit?

Decision Making

The parent and teacher committee is holding a dinner to launch the school's annual fund-raising campaign. Some teachers will be there as well as parents. Your job is to arrange the seating of the table. Seating rules:

- A teacher must be seated at each end of a table.
- If a man is at one end of the table, there must be a woman to his right and to his left.
- If a woman is at one end of the table, there must be a man to her right and to her left.

People to be seated:

Mr. Rendell, math teacher

Mrs. Dillon, English teacher

Mr. and Mrs. Brogan, parents

Dr. Roach, parent

Ms. Loretta Job, parent

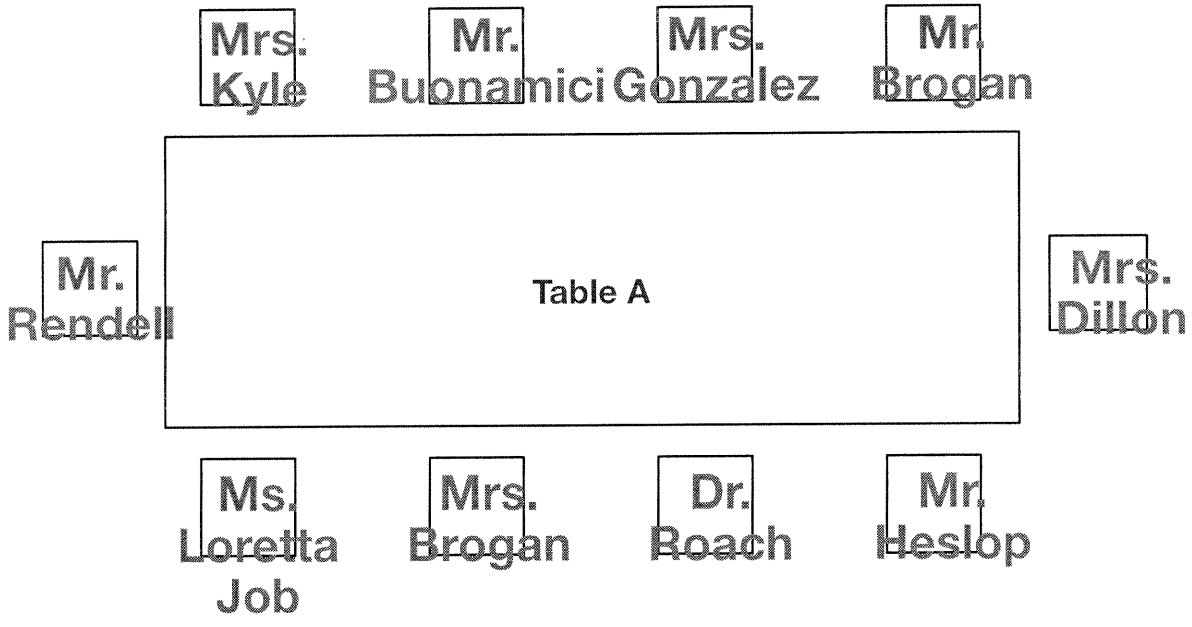
Mr. Heslop, parent

Mr. Buonamici, parent

Mrs. Kyle, parent

Mrs. Gonzalez, parent

Sample answers: Table A



Name _____

Reteaching
6-8

Dividing Mixed Numbers

You can follow these steps to find $5\frac{1}{3} \div 1\frac{1}{3}$ and $21 \div 2\frac{1}{3}$.

Step 1 First estimate. Then write each number as an improper fraction.	Step 2 Find the reciprocal of the divisor. Rewrite as a multiplication problem.	Step 3 Look for common factors. Simplify, then multiply.
Find $5\frac{1}{3} \div 1\frac{1}{3}$. Estimate $5 \div 1 = 5$. $5\frac{1}{3} \div 1\frac{1}{3} =$ $\downarrow \quad \downarrow$ $\frac{16}{3} \div \frac{4}{3}$	$\frac{16}{3} \div \frac{4}{3} =$ $\frac{16}{3} \times \frac{3}{4}$	$\frac{16}{3} \times \frac{3}{4} =$ $\frac{\overset{4}{\cancel{16}}}{\underset{1}{\cancel{3}}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{4}}} = \frac{4}{1} = 4$ 4 is close to 5, so the answer is reasonable.
Find $21 \div 2\frac{1}{3}$. Estimate $21 \div 2 = 10\frac{1}{2}$. $21 \div 2\frac{1}{3}$ $\downarrow \quad \downarrow$ $\frac{21}{1} \div \frac{7}{3}$	$\frac{21}{1} \div \frac{7}{3} =$ $\frac{21}{1} \times \frac{3}{7}$	$\frac{21}{1} \times \frac{3}{7} =$ $\frac{\overset{3}{\cancel{21}}}{1} \times \frac{3}{\underset{1}{\cancel{7}}} = \frac{9}{1} = 9$ 9 is close to $10\frac{1}{2}$, so the answer is reasonable.

Find each quotient. Simplify if possible.

1. $2\frac{2}{3} \div 3\frac{1}{4} =$ $\frac{32}{39}$
2. $1\frac{3}{4} \div 4\frac{1}{8} =$ $\frac{14}{33}$
3. $2\frac{1}{5} \div 2\frac{1}{3} =$ $\frac{33}{35}$
4. $5\frac{1}{4} \div 3 =$ $1\frac{3}{4}$
5. $10 \div 3\frac{1}{4} =$ $3\frac{1}{13}$
6. $7\frac{1}{4} \div 2\frac{1}{8} =$ $3\frac{7}{17}$

7. **Writing to Explain** Paper needs to be cut for voting ballots. Each piece of paper is $10\frac{1}{2}$ in. long. Each ballot should be $1\frac{3}{4}$ in. long. How many ballots can be cut from one piece of paper?

Six ballots can be cut.

Name _____

Practice
6-8

Dividing Mixed Numbers

Find each quotient. Simplify if possible.

1. $1\frac{1}{2} \div 2\frac{1}{3} =$ $\frac{9}{14}$
2. $4\frac{1}{4} \div 3\frac{1}{8} =$ $1\frac{9}{25}$
3. $2\frac{1}{4} \div 5\frac{1}{2} =$ $\frac{9}{22}$
4. $3\frac{1}{2} \div 2\frac{1}{4} =$ $1\frac{5}{9}$
5. $3\frac{3}{4} \div 2 =$ $1\frac{7}{8}$
6. $1\frac{1}{2} \div 2\frac{1}{4} =$ $\frac{2}{3}$
7. $8 \div 2\frac{3}{4} =$ $2\frac{10}{11}$
8. $2\frac{1}{2} \div 1\frac{3}{8} =$ $1\frac{9}{11}$
9. $4\frac{2}{3} \div 1\frac{3}{4} =$ $2\frac{2}{3}$

10. **Reasoning** Is it possible to divide 15 by a mixed number and get a quotient that is greater than 15? Explain.

No, because you are dividing by a number that is greater than 1.

Room	Gallons of Paint
Kitchen	$2\frac{1}{2}$
Bedroom	$3\frac{3}{4}$
Living room	$4\frac{1}{3}$

Max is painting the inside of an apartment complex. The table shows how many gallons of paint are needed to paint each type of room.

11. How many kitchens can Max paint with 20 gal? 8 kitchens
12. How many living rooms can Max paint with 26 gal? 6 living rooms
13. How many bedrooms can Max paint with 60 gal? 16 bedrooms

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

A 1

(B) 2

C 3

D 4

15. **Writing to Explain** Explain how you would find $4\frac{1}{5} \div 2\frac{1}{3}$. Sample answer: Write each mixed number as an improper fraction. Find the reciprocal of the second term and multiply the two fractions. Simplify the answer. $1\frac{4}{5}$

Name _____

Enrichment
6-8

A Fraction Operation

Number Sense

Fill in the empty boxes in the puzzles below so that all rows are true number sentences. Remember the order of operations: multiply and divide from left to right, then add and subtract from left to right.

Write $+$, $-$, $\times$, or $\div$ in each empty box.

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

2. $\frac{1}{4} + \frac{1}{8} \div \frac{1}{2} = \frac{1}{2}$

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

4. $6\frac{1}{4} \times \frac{1}{4} - \frac{1}{32} = 1\frac{17}{32}$

5. $3\frac{1}{4} + 7\frac{2}{3} - 9\frac{5}{12} = 1\frac{1}{2}$

6. $4\frac{1}{3} \div \frac{2}{3} + 1\frac{2}{3} = 8\frac{1}{6}$

7. $\frac{7}{11} \times 2\frac{1}{2} + 2\frac{7}{22} = 3\frac{10}{11}$

8. $\frac{7}{64} \div \frac{1}{4} \times 3\frac{1}{7} = 1\frac{3}{8}$

9. $4\frac{7}{8} \times 2\frac{1}{4} - 3 = 7\frac{31}{32}$

10. $1\frac{9}{10} \div 3\frac{1}{4} + 7 = 7\frac{38}{65}$

Name _____

Reteaching
6-9

Evaluating Expressions with Fractions

To evaluate expressions with fractions, follow the same steps as evaluating expressions with whole numbers.

- Replace with the variable with the given value.
- Follow the order of operations to solve.

Evaluate $n \times \frac{6}{7} - \frac{2}{7}$, if $n = 5$.

Replace n with 5. $5 \times \frac{6}{7} - \frac{2}{7}$

Solve. $\frac{30}{7} - \frac{2}{7} = \frac{28}{7}$

Simplify the fraction. $\frac{28}{7} = 4$

Substitute to evaluate the expressions. Simplify if possible.

1. $3a + \frac{3}{6}$, if $a = \frac{1}{4}$ $1\frac{1}{4}$

2. $\frac{5}{9} \div y + 6$, if $y = \frac{7}{12}$ $6\frac{20}{21}$

3. $\frac{3}{4} f \div \frac{6}{10}$, if $f = \frac{4}{5}$ 1

4. $6 + 8(y - \frac{3}{5})$, if $y = \frac{8}{9}$ $8\frac{14}{45}$

5. $\frac{1}{2} \div (c - \frac{3}{4})$, if $c = \frac{13}{16}$ 8

6. $d + \frac{1}{5} \times 3$, if $d = 1\frac{2}{3}$ $2\frac{4}{15}$

7. $\frac{5}{12} \div s + (\frac{2}{3} - \frac{1}{4})$, if $s = \frac{5}{6}$ $\frac{11}{12}$

8. $\frac{7}{10} - \frac{2}{5} + s \times s$, if $s = \frac{3}{4}$ $\frac{69}{80}$

9. $11g + (g \div 3)$, if $g = \frac{2}{5}$ $4\frac{8}{15}$

10. $1\frac{3}{4} \times b \div 2$, if $b = \frac{2}{3}$ $\frac{7}{12}$

11. **Persevere** Margaret is ordering mosaic tiles to cover a table top from an online store. She has narrowed her selection to two different types of tiles. Tile A is $1\frac{3}{8}$ inches wide and $2\frac{5}{8}$ inches long. Tile B is $1\frac{6}{7}$ inches wide and $2\frac{1}{2}$ inches long. Margaret wants to order the tile with the greater area. Using the expression $l \times w$ to find area, which tile should she order? Show your work.

Tile B; Tile A is $1\frac{3}{8} \times 2\frac{5}{8} = 3\frac{39}{64}$;
Tile B is $1\frac{6}{7} \times 2\frac{1}{2} = 4\frac{9}{14}$

Name _____

Practice
6-9

Evaluating Expressions with Fractions

Evaluate each expression by substituting the value. Simplify if possible.

1. $j + \frac{3}{8}$, if $j = \frac{3}{4}$ — $1\frac{1}{8}$

2. $8 - g \div \frac{7}{8}$, if $g = \frac{5}{6}$ — $7\frac{1}{21}$

3. $3m \div \frac{2}{5}$, if $m = \frac{2}{3}$ — 5

4. $w + (\frac{11}{12} - \frac{2}{3}) \times 4$, if $w = \frac{3}{4}$ — $1\frac{3}{4}$

5. $\frac{9}{10} \times h - 1\frac{1}{4}$, if $h = 2\frac{1}{2}$ — 1

6. $m + m \times \frac{4}{5}$, if $m = 1\frac{3}{7}$ — $2\frac{4}{7}$

7. $6\frac{1}{2} \div r + 4\frac{1}{2}$, if $r = \frac{3}{5}$ — $15\frac{1}{3}$

8. $c \times c + 2\frac{3}{5}$, if $c = 1\frac{1}{3}$ — $4\frac{17}{45}$

9. Evaluate the expression for values of h and complete the table.

	$h = \frac{4}{5}$	$h = \frac{2}{3}$	$h = 4\frac{1}{5}$	$h = \frac{7}{8}$
$3h - \frac{1}{3}$	$2\frac{1}{15}$	$1\frac{2}{3}$	$12\frac{4}{15}$	$2\frac{7}{24}$

10. **Algebra** Sally has 20 feet of ribbon. She is going to cut the ribbon into equal-sized lengths to make bracelets. She wants to compare how many bracelets she can make if she uses different lengths. Write an algebraic expression that Sally can use to figure out how many bracelets she can make if she cuts the ribbon into $7\frac{1}{2}$-inch or $6\frac{3}{4}$-inch lengths.

Sample answer: $(20 \times 12) \div l$, if l represents any length.

11. **Writing to Explain** How would Sally change her expression if she wants to figure out how many feet of ribbon she needs to make 100 bracelets?

Sample answer: Instead of dividing by the bracelet length, Sally would multiply that length by 100. Then she would divide that product by 12 to figure out how many feet. ~~100l ÷ 12~~

Name _____

Enrichment
6-9

Bake Sale

Decision Making

Gwen and her mother are going to prepare some foods for the school bake sale. They can choose to bake any of the foods in the chart. They can bake as many different things as they like. Use the chart to answer the questions.

Item	Sugar	Flour	Servings
Oatmeal cookies	$1\frac{1}{3}$ c	$2\frac{1}{4}$ c	18
Pound cake	$\frac{1}{2}$ c	$\frac{2}{3}$ c	12
Pumpkin bread	$1\frac{1}{2}$ c	$1\frac{3}{4}$ c	10
Apple cobbler	$\frac{1}{3}$ c	$1\frac{1}{2}$ c	8

1. Estimate to the nearest cup the amount of flour needed to make 4 loaves of pumpkin bread.

   Sample answer: About 8 c

2. Gwen wants to take at least two different items. If Gwen's mother has 2 c of sugar and 3 c of flour, name a combination of baked goods that they could prepare for the sale.

   Sample answer: Oatmeal cookies and pound cake

3. Which item would be best for Gwen to make if she wanted to make the greatest number of servings possible while using the least amount of ingredients?

   Pound cake

4. Would it take more sugar and flour combined to make the cookies or the pumpkin bread?

   Cookies use the greater amount, $3\frac{7}{12}$ c.

5. Gwen needs to take enough food to the bake sale for at least 30 servings. What are some different combinations of baked goods she could take?

   Sample answers: 1 apple cobbler and 2 pound cakes; oatmeal cookies and 1 pound cake

6. Estimate the amount of flour needed to bake everything listed in the chart.

   Sample answer: About 7 c

Name _____

Reteaching
6-10

Solving Equations with Fractions

To solve an equation with a fraction, you need to isolate the variable.

Solve $\frac{8}{10}f = \frac{1}{4}$.

Step 1

Divide each side of the equation by $\frac{8}{10}$.

$\frac{8}{10}f \div \frac{8}{10} = \frac{1}{4} \div \frac{8}{10}$

Step 2

Solve for f. Remember to use the reciprocal.

$f = \frac{1}{4} \times \frac{10}{8}$

$f = \frac{10}{32}$

Step 3

Simplify if possible.

$f = \frac{5}{16}$

Solve each equation. Simplify if possible.

1. $3a = \frac{5}{6}$ $a = \frac{5}{18}$

2. $g \div \frac{5}{8} = \frac{2}{3}$ $g = \frac{5}{12}$

3. $\frac{2}{3}h = 23$ $h = 34\frac{1}{2}$

4. $d \div \frac{3}{5} = \frac{1}{2}$ $d = \frac{3}{10}$

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

6. $\frac{7}{8}z = \frac{9}{10}$ $z = 1\frac{1}{35}$

7. $8\frac{1}{2}m = 4$ $m = \frac{8}{17}$

8. $n \div \frac{2}{3} = \frac{3}{10}$ $n = \frac{1}{5}$

9. $b \div 2\frac{1}{2} = 1\frac{3}{4}$ $b = 4\frac{3}{8}$

10. **Geometry** Helen wants to paint a rectangle with an area of 35 square feet on her wall. If the height of the rectangle is $3\frac{3}{4}$ feet, what is the width of the rectangle? (Remember, area = length × width.) Write an equation and solve.

$3\frac{3}{4}w = 35$; $w = 9\frac{1}{3}$ feet

Name _____

Practice
6-10

Solving Equations with Fractions

Solve each equation. Simplify if possible.

1. $j \div 6 = \frac{9}{10}$ $j = 5\frac{2}{5}$

2. $d \div 12 = \frac{1}{6}$ $d = 2$

3. $4v = 3\frac{2}{3}$ $v = \frac{11}{12}$

4. $4\frac{2}{5} \times b = 1\frac{5}{6}$ $b = \frac{5}{12}$

5. $\frac{2}{5}h = \frac{3}{4}$ $h = 1\frac{7}{8}$

6. $3\frac{1}{3} \times s = 20$ $s = 6$

7. $t \div \frac{3}{8} = \frac{3}{4}$ $t = \frac{9}{32}$

8. $c \div 2\frac{1}{3} = \frac{1}{4}$ $c = \frac{7}{12}$

9. Peggy worked $20\frac{2}{3}$ hours over three days last week. She worked the same number of hours each day. How many hours did Peggy work each day? Write an equation and solve.

$3h = 20\frac{2}{3}$; $6\frac{8}{9}$ hours each day.

10. **Writing to Explain** The children's room at a local library has a square-shaped floor with an area of 400 feet. How can you find the length and width of the room without knowing either measurement?

Since the floor is square, I know length = width; I can write an equation: $s \times s = 400$. I know $20 \times 20 = 400$, so I know that $s = 20$. I can check my equation by substituting 20 for each s and solving.

11. **Reasoning** Which equation do you think has the greater solution: $1\frac{4}{5}h = 3\frac{1}{3}$ or $3\frac{1}{3}g = 2$? Explain your thinking. Then, solve to check your prediction.

$1\frac{4}{5}h = 3\frac{1}{3}$ has a greater solution because the product is larger than the multiplier. $h = 1\frac{23}{27}$, while g is $\frac{3}{5}$.

Name _____

Enrichment
6-10

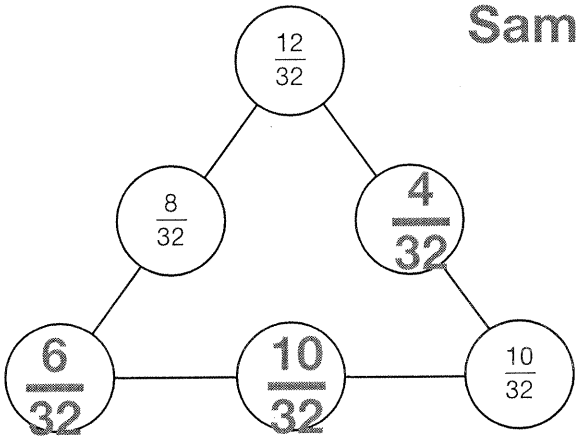
Tri-Puzzling

Number Sense

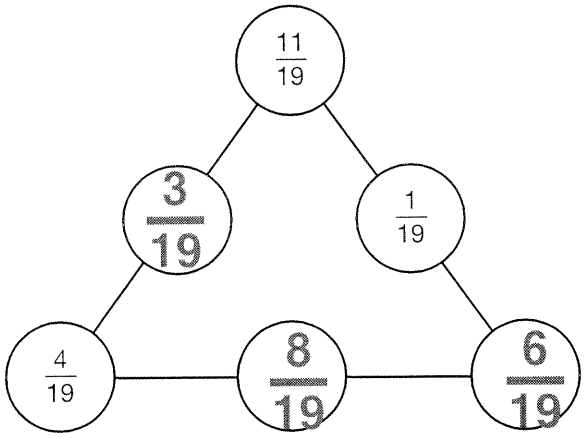
The sum of the fractions on each side of each triangle is the same. Complete each triangle by filling in the missing fractions.

Sample answers given.

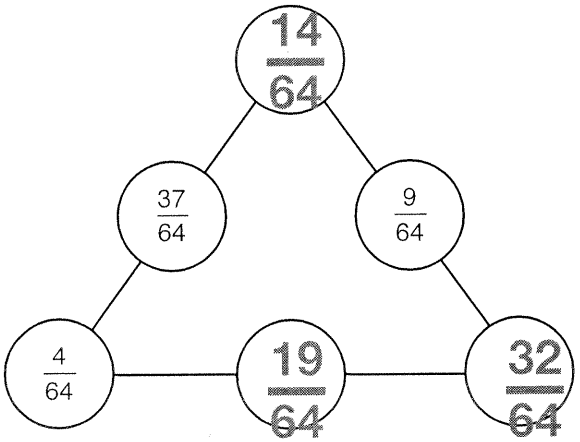
1.



2.



3.



Name _____

Reteaching
6-11

Problem Solving: Look for a Pattern

Sometimes you can solve a problem by identifying a pattern.
Here are two types of patterns.

Patterns in sets of numbers

$\frac{15}{4}, \frac{13}{4}, \frac{11}{4}, \frac{9}{4}, \frac{7}{4}, \frac{5}{4}, \frac{3}{4}$

Ask yourself:
Are the numbers increasing?
Are they decreasing?
Do they change by the same amount each time?
Do you add, subtract, multiply, or divide to find the next number?

Patterns in groups of figures

Ask yourself:
How is the first figure modified to make the second figure?
How is the second figure modified to make the third?

Remember: Once you have identified a possible number pattern, check at least two other consecutive numbers to make sure that the pattern is true for all of the numbers.

Find the missing numbers. Describe the pattern.

1. $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$ — Add $\frac{1}{4}$
2. 89, 78, 67, 56, 45, 34, 23, 12, 1 — Subtract 11
3. $\frac{1}{5}, \frac{4}{5}, \frac{7}{5}, \frac{10}{5}, \frac{13}{5}, \frac{16}{5}, \frac{19}{5}, \frac{22}{5}, \frac{25}{5}$ — Add $\frac{3}{5}$

4. Draw the next figure in the pattern below.

5. **Number Sense** The table below shows the number of cells in a culture. How many cells will there be at 4:30?

Time	1:00	1:30	2:00	2:30	3:00
Number of Cells	1	2	4	8	16

128 cells

Name _____

Practice
6-11

Problem Solving: Look for a Pattern

Find the missing numbers. Describe the pattern.

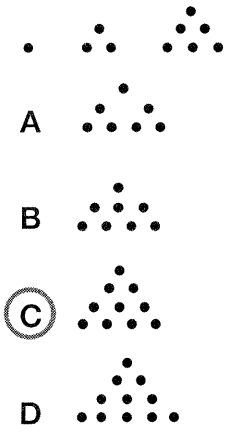
1. $\frac{1}{8}, \frac{6}{8}, \frac{11}{8}, \frac{16}{8}, \frac{21}{8}, \frac{26}{8}, \frac{31}{8}, \frac{36}{8}, \frac{41}{8}$ — Add $\frac{5}{8}$
2. $\frac{1}{4}, \frac{1}{2}, 1, 2, 4, 8, 16, 32, 64$ — Multiply by 2
3. 1.1, 1.1, 2.2, 6.6, 26.4, 132, 792, 5,544 — Multiply by 1, then by 2, then by 3, etc.
4. $14\frac{1}{2}, 12\frac{3}{4}, 11, 9\frac{1}{4}, 7\frac{1}{2}, 5\frac{3}{4}, 4, 2\frac{1}{4}, \frac{1}{2}$ — Subtract $1\frac{3}{4}$
5. 27, 9, 3, 1, $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \frac{1}{243}$ — Multiply by $\frac{1}{3}$ or divide by 3
6. 3, 5, 9, 15, 23, 33, 45, 59, 75 — Add 2, add 4, add 6, etc.

7. **Number Sense** In the figure, the sum of each row forms a pattern. What is the sum of the seventh row?

   49

```
        1
      2   2
    3   3   3
  4   4   4   4
5   5   5   5   5
```

8. Which figure completes this pattern?



A

B

(C)

D

9. **Writing to Explain** How can you find the answer to exercise **7** without finding the sum of the numbers in a row?

   Sample answer: You can square the number of the row: row 2 = 2^2 or 4, row 3 = 3^2 or 9, row 7 = 7^2 or 49, and so on.

Name _____

Enrichment
6-11

Keep to the Schedule

Decision Making

Kaya is the manager of the city volleyball league. She has to make a game schedule that meets the following requirements.

- There are 6 teams: Robins, Orioles, Cardinals, Bluebirds, Hawks, and Eagles.
- Each team must play each other team at least twice.
- The Cardinals cannot play during Week 2.
- The Bluebirds cannot play during Week 4.
- Each team can play up to 2 games per week.
- There are 4 games per week.

Make a game schedule for Kaya that meets all of the requirements. Use these abbreviations: R = Robins, O = Orioles, C = Cardinals, B = Bluebirds, H = Hawks, E = Eagles. The first week is done for you.

Sample answers are given.

City Volleyball League Schedule

Week	Games			
1	R-O	E-C	C-B	B-H
2	H-E	B-E	O-H	O-B
3	E-C	B-R	H-B	C-O
4	O-E	R-H	E-R	O-C
5	R-O	C-B	H-C	H-E
6	B-E	C-H	B-O	R-C
7	R-B	O-H	C-R	E-O
8	H-R	R-E	C-B	H-O

