5th Grade

Enrichment Booklet

Chapters 1, 2, and 3

Name: _____ Date: _____

Chapter 1

Enrichment
Whole Numbers and the Four Operations

Activity 1 Numbers to 10,000,000

Answer each question.

1 Ms. Hall gave the following question to her class to answer.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1,000,000 1,000,000		10,000 10,000 10,000	1,000 1,000 1,000 1,000 1,000	100 100 100 100 100 100 100		1 1 1 1

Expanded form: _____

Standard form: _____

Word form: _____

John's solution:

Expanded form: 200,000 + 30,000 + 5,000 + 70 + 4
Standard form: 235,074
Word form: two hundred thirty-five thousand, seventy-four

a Is John's solution correct? Explain.

b Show the correct solution.

2 Ms. Green forgot the 7-digit security code used to access her email inbox. Use the following clues to help her find the code.

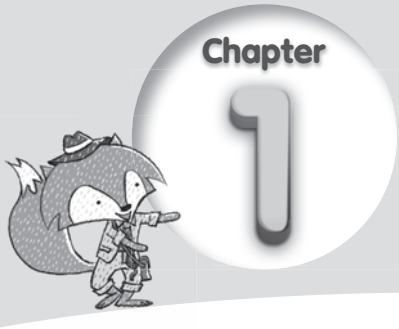
- There is a 2 in the thousands place.
- The digit in the tens place is 3 times the digit in the thousands place.
- The digit in the ones place is 2 less than 9.
- The digit in the ten thousands place is 4 less than the digit in the ones place.
- Multiply the digit in the ten thousands place by 2 to find the digit in the millions place.
- The digit in the hundreds place is 3 more than the digit in the tens place.
- The difference between the digit in the thousands place and the digit in the tens place is the digit in the hundred thousands place.

3 The following numbers are arranged in a pattern.

2,381,584 2,385,604 2,389,624 2,393,644 2,397,664

Change any two digits in each number and keep the numbers in the same pattern.

Name: _____ Date: _____



Enrichment
Whole Numbers and the Four Operations

Activity 2 Multiplying by Tens, Hundreds, Thousands, and Powers of Tens

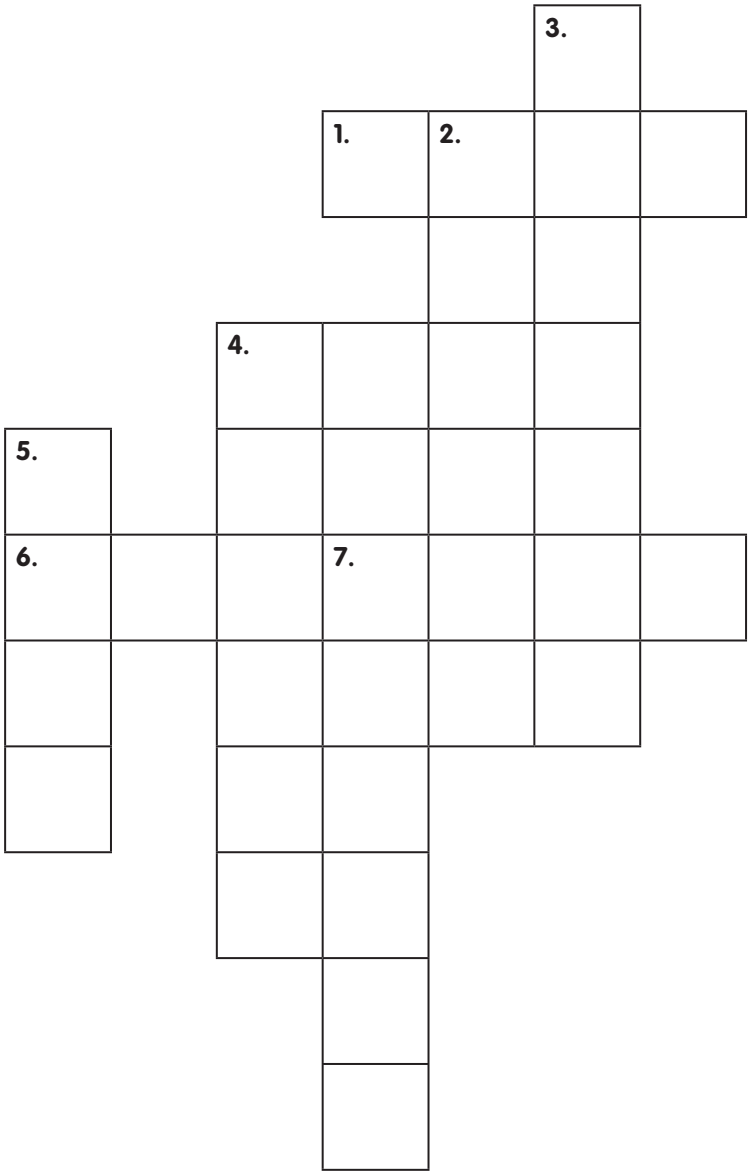
Use the clues to complete the cross-number puzzle.

Across

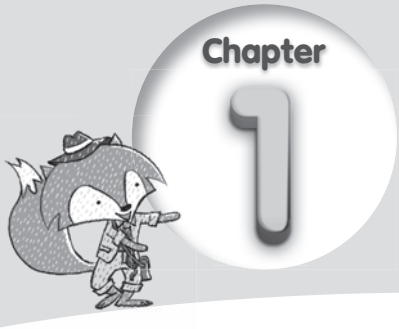
1. 123×10
4. 97×20
6. $5{,}487 \times 1{,}000$

Down

2. $2{,}346 \times 100$
3. $325 \times 4{,}000$
4. 495×300
5. 65×10^2
7. 762×10^3



Name: _____ Date: _____



Enrichment
Whole Numbers and the Four Operations

Activity 3 Dividing by Tens, Hundreds, or Thousands

Use the clues to complete the cross-number puzzle.

Across

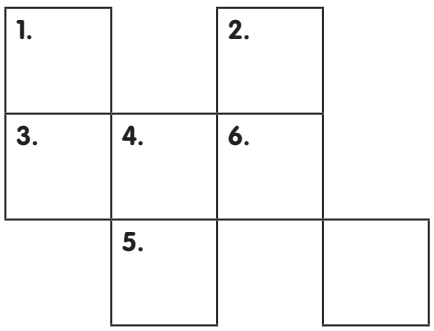
3. 10,560 ÷ 80
5. 7,000 ÷ 1,000

Down

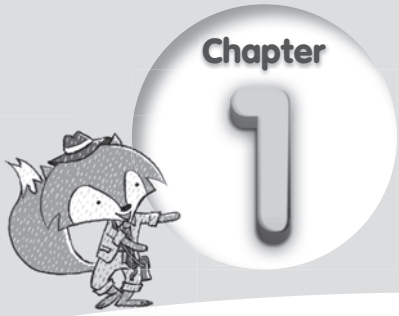
1. 910 ÷ 10
2. 7,200 ÷ 600
4. 74,000 ÷ 2,000

Diagonal

6. 2,600 ÷ 100



Name: _____ Date: _____



Enrichment
Whole Numbers and the Four Operations

Activity 4 Multiplying and Dividing by 2-Digit Numbers Fluently

Solve. Show your work.

1 a Multiply 1,478 by 36.

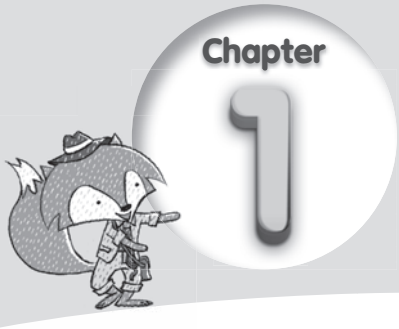
b Then, write three different expressions that give the same product.

2 a What is the quotient and the remainder when you divide 9,786 by 45?

b Then, use a calculator to find another way to get the quotient and the remainder.

3 An alarm triggers when the load in a lift exceeds 2,500 kilograms. Mr. Smith wants to move some bricks to the eighth floor. His mass is 85 kilograms and the mass of each pallet of bricks is 750 kilograms. What is the greatest number of pallets of bricks that he can carry into the lift without triggering the alarm?

Name: _____ Date: _____



Enrichment
Whole Numbers and the Four Operations

Activity 5 Order of Operations

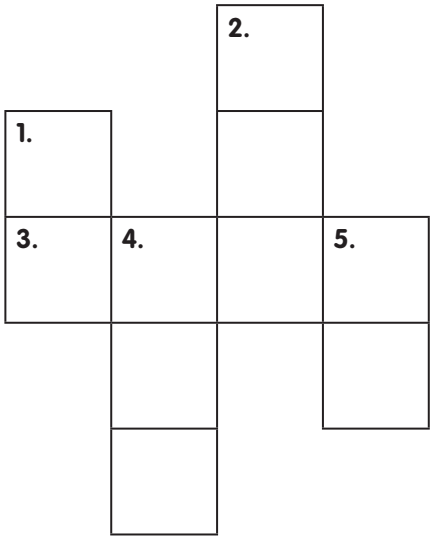
Use the clues to complete the cross-number puzzle.

Across

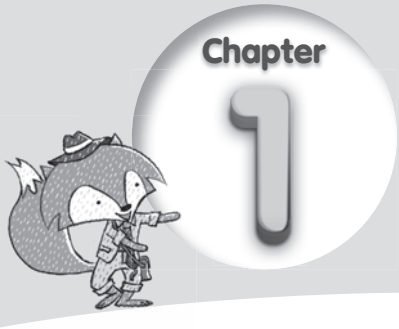
3. (42 – 18) × 12 × (3 + 6)

Down

1. (21 – 5) × 8 ÷ (31 – 27)
2. 184 + (85 – 64) ÷ 3 + 8
4. (76 + 52 – 28) × (2 + 3)
5. (86 + 54) ÷ 7 + 9



Name: _____ Date: _____



Enrichment
Whole Numbers and the Four Operations

Activity 6 Real-World Problems: Four Operations of Whole Numbers

Solve. Show your work.

1. Haley has 37 magnets. María has 28 magnets. How many magnets must María give to Haley so that Haley will have 4 times the number of magnets that María has?

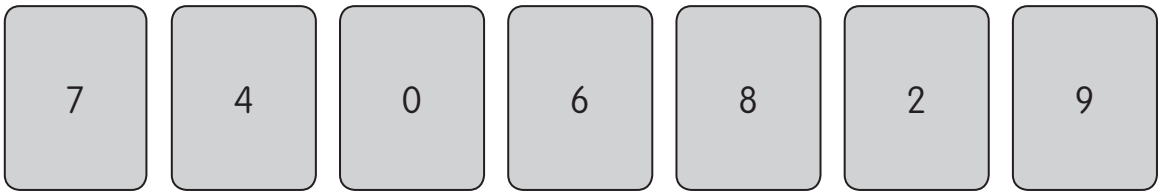
2. 30 questions were given in a mathematics competition. Each correct answer earned 5 points, and 2 points were deducted for each incorrect answer. No points were deducted for any unanswered question. Logan answered all but one of the questions, receiving a score of 110 points. How many correct answers did Logan have?

3 A fiction book costs 3 times as much as a magazine. The total cost of 12 magazines and 15 fiction books is $1,026. How much does a magazine cost?

Name: _____ Date: _____

Mathematical Habit 1 **Persevere in solving problems**

You are given six number cards.



1. Write the greatest 7-digit number using the given number cards.

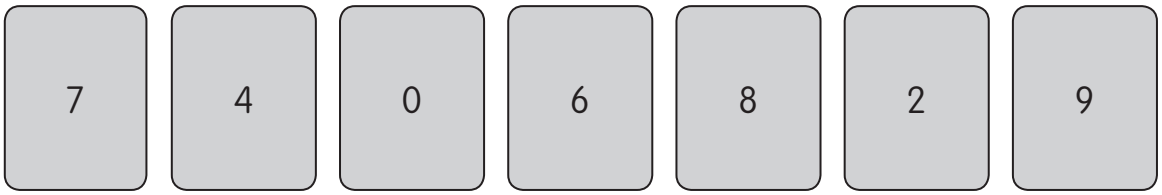
2. Write the least 7-digit number using the given number cards.

3. Find the difference between your answers in questions 1 and 2. Is this the greatest difference between two 7-digit numbers using the digits 7, 4, 0, 6, 8, 2, and 9?

Name: _____ Date: _____

Mathematical Habit 1 **Persevere in solving problems**

You are given six number cards.

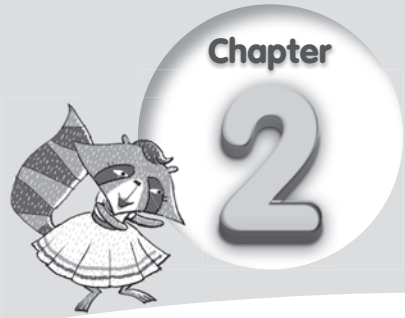


1. Write the greatest 7-digit number using the given number cards.

2. Write the least 7-digit number using the given number cards.

3. Find the difference between your answers in questions 1 and 2. Is this the greatest difference between two 7-digit numbers using the digits 7, 4, 0, 6, 8, 2, and 9?

Name: _____ Date: _____



Enrichment
Fractions and Mixed Numbers

Activity 1 Fractions, Mixed Numbers, and Division Expressions

Solve. Show your work.

1. Find the sum of $2 \div 3$ and $4 \div 9$.

2. Use a calculator to find the values of each fraction in decimal form.

$\frac{1}{2} =$ _____ $\frac{3}{4} =$ _____

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

$\frac{7}{8} =$ _____ $\frac{2}{9} =$ _____

$\frac{6}{11} =$ _____ $\frac{11}{12} =$ _____

Place the fractions in two groups. Explain how you would group them.

3 **a** Using the ÷ key on your calculator, express each fraction as a decimal. Round each answer to 3 decimal places.

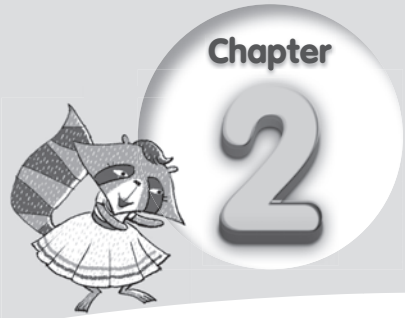
$\frac{1}{9}$ = _____ $\frac{2}{9}$ = _____

$\frac{3}{9}$ = _____ $\frac{4}{9}$ = _____

What do you observe?

b Using the pattern observed, express $\frac{7}{9}$ as a decimal correct to 3 decimal places without using a calculator.

Name: _____ Date: _____

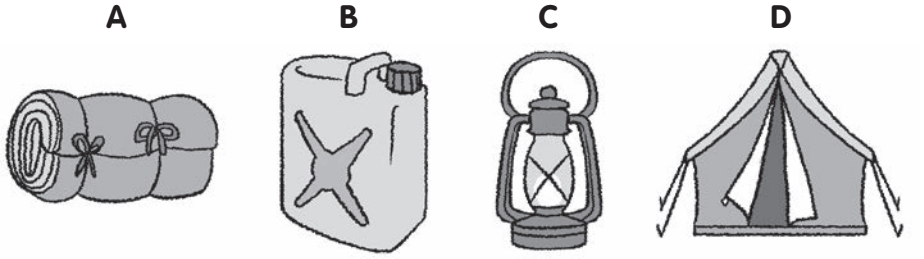


Enrichment
Fractions and Mixed Numbers

Activity 2 Adding Unlike Fractions and Mixed Numbers

Solve. Show your work.

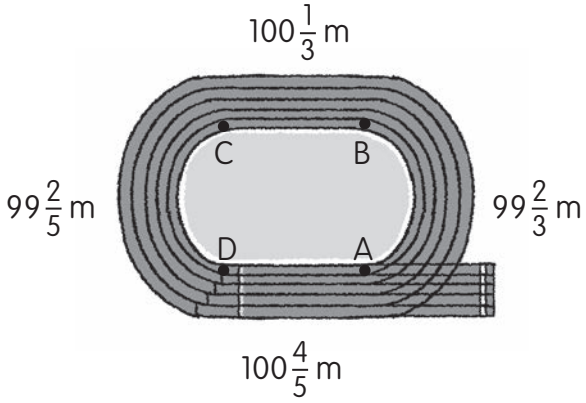
1. Joseph and Owen volunteered to bring the following items to the campsite during a school camp. If each of them can carry only two items in their backpack, there is a total of six possible combinations that they can choose from.



$2\frac{2}{5}$ kg $\frac{10}{3}$ kg $\frac{13}{5}$ kg $2\frac{3}{7}$ kg

Find the pair of items that Joseph can pick so that he will carry the least possible mass.

2 A relay race was to take place at the running track. The starting point of each runner is shown below, together with the distance between them.

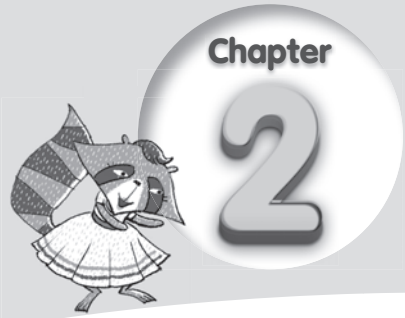


a Find the total distance that will be covered by the four runners.

b Michael claims that the distance to be covered by Runner A is longer than that of Runner C. Do you agree with his statement? Explain.

3 List down the steps that you would use to estimate the sum of $3\frac{7}{9}$ and $4\frac{4}{7}$.

Name: _____ Date: _____



Enrichment
Fractions and Mixed Numbers

Activity 3 Subtracting Unlike Fractions and Mixed Numbers

Solve. Show your work.

1 **a** Five fractions and mixed numbers are to be arranged in a pattern. Four of them are shown below.

$2\frac{5}{6}$ $7\frac{1}{2}$ $4\frac{5}{6}$ $1\frac{1}{2}$?

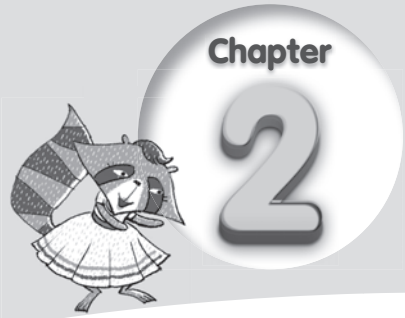
The missing fraction is the least of the five fractions and mixed numbers. Find the missing fraction.

b Then, write the five fractions and mixed numbers in order from greatest to least.

2 It takes 5 minutes to fill an empty container with water from a tap. When the tap is turned off, and the drain is opened, it takes 6 minutes for the container to empty. How long will it take to fill the empty container when the tap is running and the drain is opened?

3 List down the steps that you would use to estimate the difference between $6\frac{9}{11}$ and $1\frac{1}{12}$.

Name: _____ Date: _____



Enrichment
Fractions and Mixed Numbers

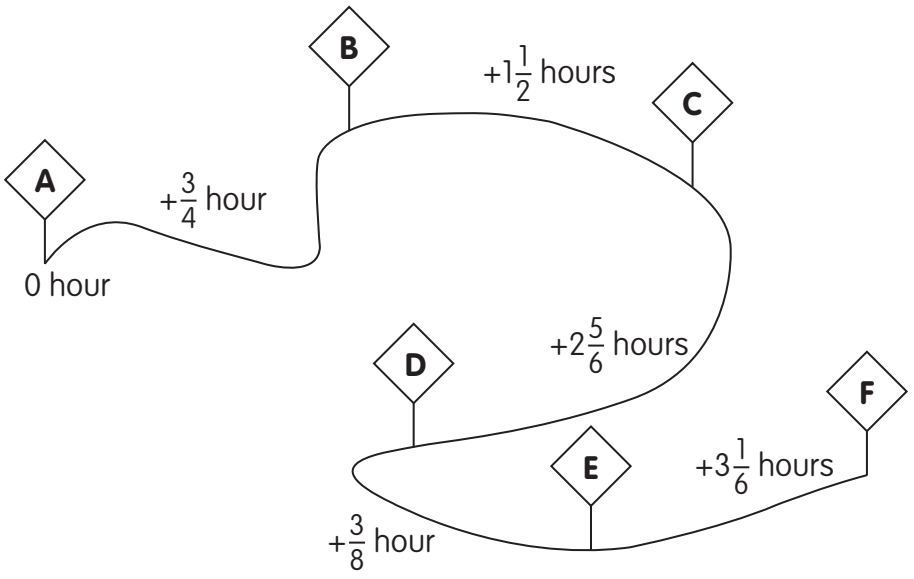
Activity 4 Real-World Problems: Fractions and Mixed Numbers

Solve. Show your work.

1. Van's age is $\frac{1}{8}$ of his mother's age. His mother will be 67 years old in 3 years. In how many years will Van's age be $\frac{1}{5}$ of his mother's age?

2. Clara traveled $3\frac{3}{4}$ kilometers from her home to her school. She then traveled another $\frac{4}{5}$ kilometer from her school to the library. She traveled another $2\frac{7}{10}$ kilometers from the library back to her home. How many kilometers did she travel in all?

3 Farrah and Dylan went on a cycling trip.



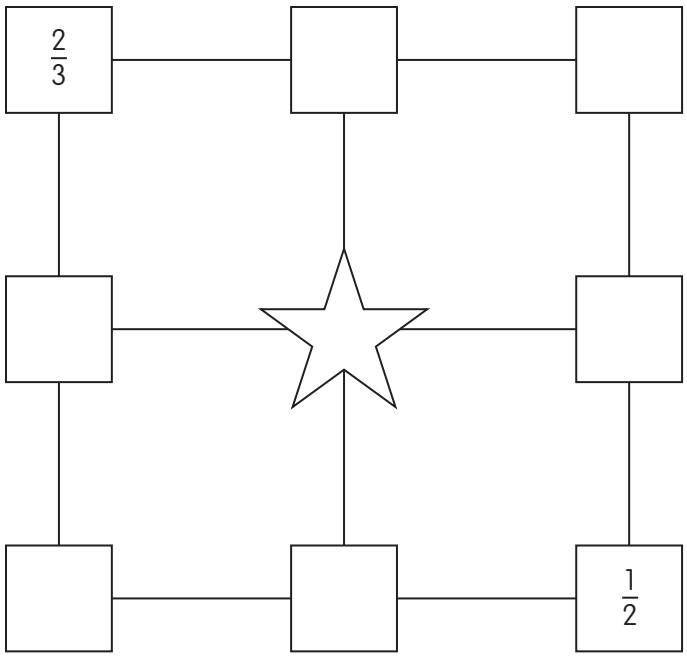
Farrah cycled from Point B to Point E. Dylan cycled from Point A to Point F. How much more time did Dylan take than Farrah?

Name: _____ Date: _____

Mathematical Habit 7 **Make use of structure**

1 **a** Fill in each blank using the given fractions so that the sum of the fractions in the three squares along each side of the figure is equal to $1\frac{1}{2}$.

$\frac{1}{30}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{12}$	$\frac{4}{5}$	$\frac{3}{4}$



b Find the missing fraction to fill in the star in **a** so that the fractions in each set of square-star-square will add up to 1.

Mathematical Habit 1 Persevere in solving problems

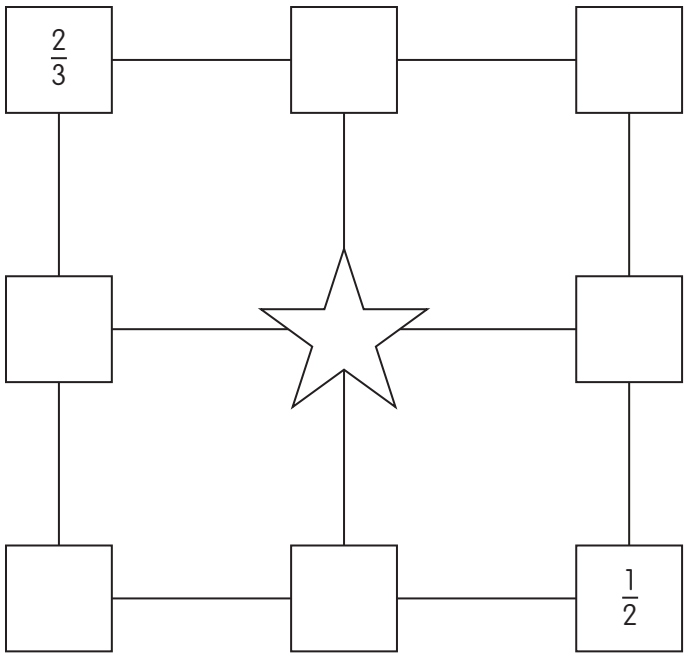
2 Mai wants to fill 15 small tanks and 20 large tanks to the brim with water. The capacity of each small tank is one-third of the capacity of a large tank. Find the fraction of the total amount of water used to fill up all the small tanks using two methods.

Name: _____ Date: _____

Mathematical Habit 7 **Make use of structure**

1 **a** Fill in each blank using the given fractions so that the sum of the fractions in the three squares along each side of the figure is equal to $1\frac{1}{2}$.

$\frac{1}{30}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{12}$	$\frac{4}{5}$	$\frac{3}{4}$

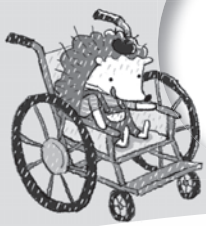


b Find the missing fraction to fill in the star in **a** so that the fractions in each set of square-star-square will add up to 1.

Mathematical Habit 1 Persevere in solving problems

2 Mai wants to fill 15 small tanks and 20 large tanks to the brim with water. The capacity of each small tank is one-third of the capacity of a large tank. Find the fraction of the total amount of water used to fill up all the small tanks using two methods.

Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 1 Multiplying Fractions by Whole Numbers

Solve. Show your work.

1 Austin was given the following problem:

$\frac{28}{35} \times 5 = ?$

Austin solved it as follows:

$$\frac{28}{35} \times 5 = \frac{28 \div 7}{35 \div 5} \times 5$$
$$= \frac{4}{7} \times 5$$
$$= \frac{4 \times 5}{7}$$
$$= \frac{20}{7}$$
$$= 2\frac{6}{7}$$

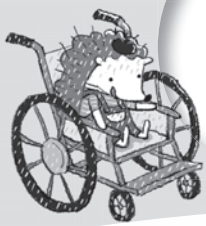
a What mistake did he make?

b Show the correct solution to the problem below.

2 The product of an improper fraction and a whole number is $7\frac{7}{9}$. Find two sets of numbers that would result in this product.

3 A ball rebounds one-quarter of the height from which it is dropped. Hannah drops the ball from a height of 1,024 centimeters. How high will it rebound after three bounces?

Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

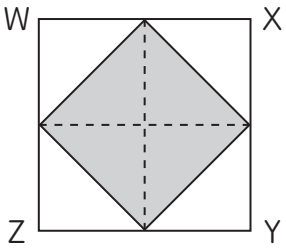
Activity 2 Multiplying Proper Fractions

Solve. Show your work.

1. A lion is $\frac{9}{10}$ meter tall. A chimpanzee is $\frac{7}{8}$ as tall as the lion. A cheetah is $\frac{8}{9}$ as tall as the chimpanzee. How tall is the cheetah?

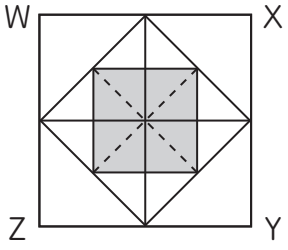
2. $\frac{1}{5}$ of the participants in a marathon did not complete the marathon. $\frac{5}{6}$ of the participants who did complete the marathon were adults. $\frac{1}{4}$ of the participants who did not complete the marathon were children. What fraction of the participants were children?

3 The area of Square WXYZ is 1 square unit. The midpoint of WX is a point halfway between Points W and X. The midpoints of the sides of Square WXYZ are joined to form a smaller square as shown.

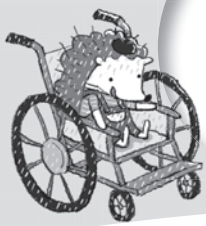


a What is the area of the smaller square?

b The midpoints of the sides of the smaller square are joined to form yet another smaller square as shown. Find the area of the new smaller square.



Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 3 Real-World Problems: Multiplying with Proper Fractions

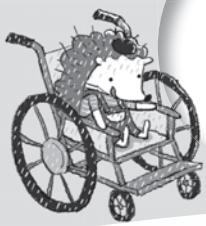
Solve. Show your work.

1. Ms. Howard spent $\frac{1}{3}$ of her monthly salary on groceries and $\frac{1}{4}$ of it on entertainment. She spent $\frac{2}{5}$ of the remainder on transportation. She then had $270 left. Find Ms. Howard's salary.

2. Ian gave his father $\frac{1}{5}$ of his cash prize in a competition. He then gave $\frac{1}{4}$ of the remainder to his mother and $\frac{1}{8}$ of the remainder to his sister. He then had $250 left. How much money did Ian win?

3 Simone spends $\frac{1}{6}$ of her savings on a blouse and $\frac{3}{5}$ of the remainder on a dress. What fraction of her savings did she have left after buying the two items?

Name: _____ Date: _____



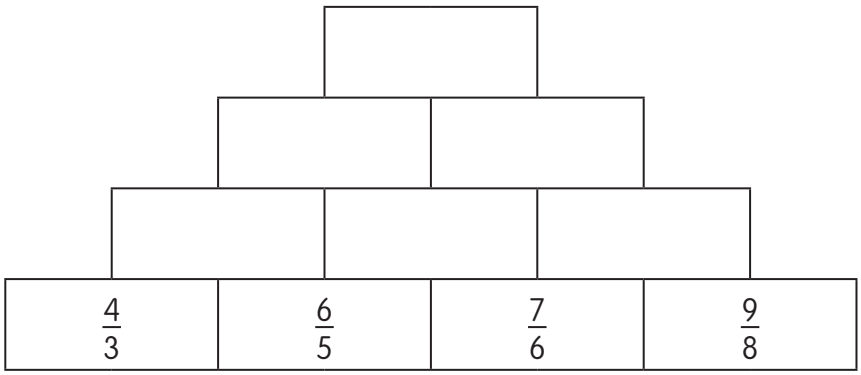
Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

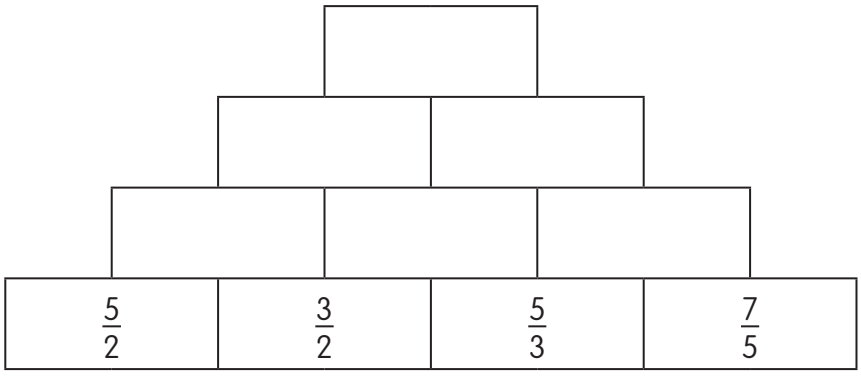
Activity 4 Multiplying Improper Fractions by Fractions

The fraction in each rectangle is the product of the fraction in the two rectangles below it. Write each product as a mixed number in simplest form.

1



2



Match each pair of products.

3

$\frac{9}{2} \times \frac{3}{5}$ ●

$\frac{9}{2} \times \frac{20}{9}$ ●

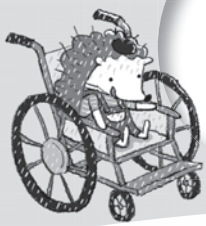
$\frac{9}{10} \times \frac{8}{5}$ ●

● $\frac{4}{9} \times \frac{45}{2}$

● $\frac{6}{5} \times \frac{6}{5}$

● $\frac{6}{5} \times \frac{9}{4}$

Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 5 Multiplying Mixed Numbers and Whole Numbers

Solve. Show your work.

1 Explain which card has the greater value without multiplying.

Card A

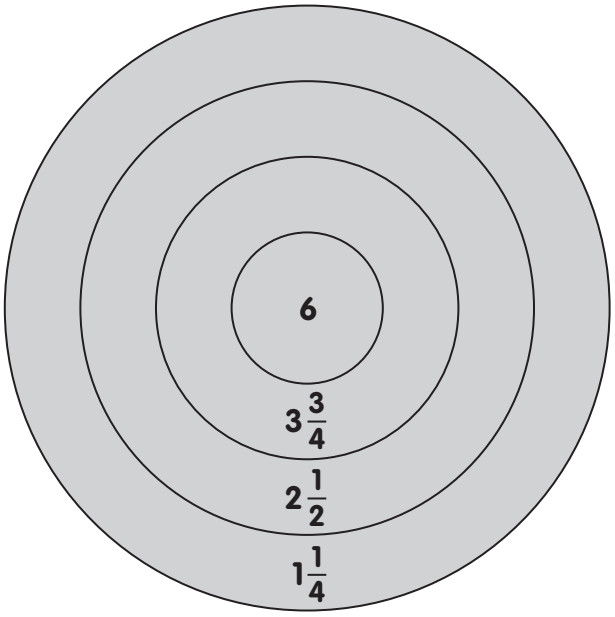
$\frac{14}{5} \times \frac{3}{4}$

Card B

$\frac{7}{5} \times \frac{7}{8}$

2 Ella uses a calculator to find the product of a mixed number and the number 4. She presses [5] instead of [4] and obtains an answer of 64. What should the correct answer be?

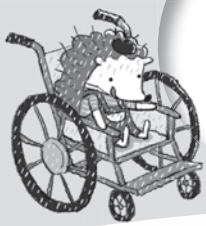
3 Each ring on a dartboard has a point as shown. Paige and Sara each shoots two arrows at the dartboard and multiply the points to get their score.



a Paige's score is greater than 10. Which two rings could her arrows have landed on?

b Sara's score is a whole number. Which two rings could her arrows have landed on?

Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 6 Real-World Problems: Multiplying with Mixed Numbers

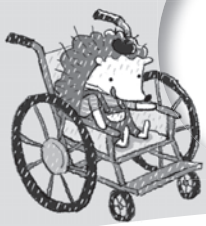
Solve. Show your work.

1. A bucket is $\frac{2}{3}$ full of water. It will be $\frac{8}{9}$ full if $2\frac{2}{3}$ liters of water are poured into the bucket. What is the capacity of the bucket?

2. A chef ordered some cooking oil for his restaurant. He had $\frac{3}{5}$ of the cooking oil left after 6 days. $4\frac{2}{3}$ liters of cooking oil were left after another 5 days. How many liters of cooking oil did the chef order?

3 A fishmonger has some seafood to sell. $\frac{1}{4}$ of the weight of the shrimps and $\frac{1}{6}$ of the weight of the fish make up $52\frac{1}{4}$ pounds of the seafood that he has. The total weight of the seafood that he has is $261\frac{1}{4}$ pounds. Find the weight of the fish that he has.

Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 7 Dividing Fractions and Whole Numbers

Solve. Show your work.

1. When a whole number is divided by a proper fraction, is the answer greater or less than the whole number? Explain why with examples.

2. Tomas and Riley were each given an expression to evaluate.

   Tomas $\frac{1}{6} \div 4$

   Riley $\frac{3}{8} \div 6$

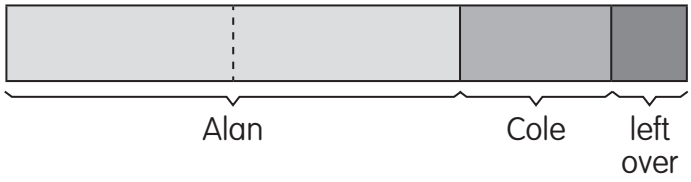
   They obtained answers to each expression as follows:

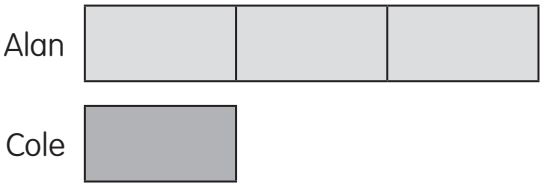
   Tomas $\frac{1}{6} \div 4 = \frac{3}{2}$

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

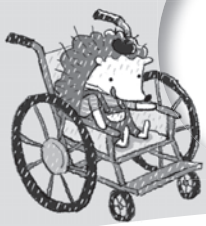
   Are their answers correct? Give a possible explanation as to how Tomas and/or Riley could have arrived at the incorrect answer. Then, write the correct answer to the expression.

3 Write a two-step word problem using the bar models. Then, solve the problem.





Name: _____ Date: _____



Chapter 3

Enrichment
Multiplying and Dividing Fractions and Mixed Numbers

Activity 8 Real-World Problems: Multiplying and Dividing with Fractions

Solve. Show your work.

1. Valery is decorating a wall with some balloons. She places the balloons at equal distances apart in a straight line. The 4th balloon and the 7th balloon are $1\frac{3}{4}$ meters apart. The 3rd balloon is $9\frac{11}{12}$ meters away from the last balloon. How many balloons does she use?

2. A runner takes part in a 10-kilometer marathon. He reports at a checkpoint after running every $\frac{4}{5}$ kilometer. How many checkpoints does he report at, including the one at the start and the one at the end?

3 Hunter uses a $\frac{9}{10}$-meter ribbon to make some bookmarks. He cuts the ribbon into $\frac{1}{6}$-meter pieces.

a How many $\frac{1}{6}$-meter pieces are there?

b What is the length of the remaining ribbon?

Name: _____ Date: _____

PUT ON YOUR THINKING CAP!

Mathematical Habit 4 **Use mathematical models**

1. Kaylee, Martín, and Landon shared a pack of chocolate bars. Kaylee took $\frac{3}{4}$ of the pack and $\frac{1}{4}$ of a chocolate bar. Martín took $\frac{3}{4}$ of the remaining chocolate bars in the pack and $\frac{1}{4}$ of a chocolate bar. There were 2 chocolate bars left for Landon. How many chocolate bars were in the pack at first?

Mathematical Habit 4 **Use mathematical models**

2 Julia, Ethan, and Grace shared some pies. Julia took $\frac{5}{6}$ of the pies and $\frac{1}{3}$ of another pie. Ethan took $\frac{2}{3}$ of the remaining pies and $\frac{1}{3}$ of another pie. Grace took the rest of the pies. Grace received 6 pies. How many pies were there in all?

Name: _____ Date: _____

PUT ON YOUR THINKING CAP!

Mathematical Habit 4 **Use mathematical models**

1. Kaylee, Martín, and Landon shared a pack of chocolate bars. Kaylee took $\frac{3}{4}$ of the pack and $\frac{1}{4}$ of a chocolate bar. Martín took $\frac{3}{4}$ of the remaining chocolate bars in the pack and $\frac{1}{4}$ of a chocolate bar. There were 2 chocolate bars left for Landon. How many chocolate bars were in the pack at first?

Mathematical Habit 4 **Use mathematical models**

2 Julia, Ethan, and Grace shared some pies. Julia took $\frac{5}{6}$ of the pies and $\frac{1}{3}$ of another pie. Ethan took $\frac{2}{3}$ of the remaining pies and $\frac{1}{3}$ of another pie. Grace took the rest of the pies. Grace received 6 pies. How many pies were there in all?