Properties

Essential Question How can you use properties of operations to solve problems?

COMMON CORE STANDARD CC.5.NBT.6
Perform operations with multi-digit whole numbers and with decimals to hundredths.

You can use the properties of operations to help you evaluate numerical expressions more easily.

Properties of Addition

Commutative Property of Addition	
If the order of addends changes, the sum stays the same.	$12 + 7 = 7 + 12$
Associative Property of Addition	
If the grouping of addends changes, the sum stays the same.	$5 + (8 + 14) = (5 + 8) + 14$
Identity Property of Addition	
The sum of any number and 0 is that number.	$13 + 0 = 13$

Properties of Multiplication

Commutative Property of Multiplication	
If the order of factors changes, the product stays the same.	$4 \times 9 = 9 \times 4$
Associative Property of Multiplication	
If the grouping of factors changes, the product stays the same.	$11 \times (3 \times 6) = (11 \times 3) \times 6$
Identity Property of Multiplication	
The product of any number and 1 is that number.	$4 \times 1 = 4$

UNLOCK the Problem REAL WORLD

The table shows the number of bones in several parts of the human body. What is the total number of bones in the ribs, the skull, and the spine?

Part	Number of Bones
Ankle	7
Ribs	24
Skull	28
Spine	26

Multiplication Patterns

Essential Question How can you use a basic fact and a pattern to multiply by a 2-digit number?

🔑 UNLOCK the Problem REAL WORLD

How close have you been to a bumblebee?

The actual length of a queen bumblebee is about 20 millimeters. The photograph shows part of a bee under a microscope, at 10 times its actual size. What would the length of the bee appear to be at a magnification of 300 times its actual size?

- What would the length of the bee shown in the photograph appear to be if the microscope shows it at 10 times its actual size?

  _____

Multiply. $50 \times 8,000$

Multiply by 1-Digit Numbers

Essential Question How do you multiply by 1-digit numbers?

🔑 UNLOCK the Problem ⟩REAL ⟩WORLD

Each day an airline flies 9 commercial jets from New York to London, England. Each plane holds 293 passengers. If every seat is taken on all flights, how many people fly on this airline from New York to London in 1 day?

▲ The Queen's Guard protects Britain's Royal Family and their residences.

- How can you tell if your answer is reasonable? _____

_____

Name _____

Multiply by 2-Digit Numbers

Essential Question How do you multiply by 2-digit numbers?

🔑 UNLOCK the Problem REAL WORLD

A tiger can eat as much as 40 pounds of food at a time but it may go for several days without eating anything. Suppose a Siberian tiger in the wild eats an average of 18 pounds of food per day. How much food will the tiger eat in 28 days if he eats that amount each day?

Remember

Use patterns of zeros to find the product of multiples of 10.

$$3 \times 4 = 12$$

$$3 \times 40 = 120 \qquad 30 \times 40 = 1{,}200$$

$$3 \times 400 = 1{,}200 \qquad 300 \times 40 = 12{,}000$$

Name _____

Problem Solving • Multiplication and Division

Essential Question How can you use the strategy *solve a simpler problem* to help you solve a division problem?

UNLOCK the Problem REAL WORLD

Mark works at an animal shelter. To feed 9 dogs, Mark empties eight 18-ounce cans of dog food into a large bowl. If he divides the food equally among the dogs, how many ounces of food will each dog get?

Use the graphic organizer below to help you solve the problem.

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

Name _____

Evaluate Numerical Expressions

Essential Question In what order must operations be evaluated to find the solution to a problem?

CONNECT Remember that a numerical expression is a mathematical phrase that uses only numbers and operation symbols.

$(5 - 2) \times 7$ $72 \div 9 + 16$ $(24 - 15) + 32$

To **evaluate**, or find the value of, a numerical expression with more than one operation, you must follow rules called the **order of operations.** The order of operations tells you in what order you should evaluate an expression.

Order of Operations

1. Perform operations in parentheses.

2. Multiply and divide from left to right.

3. Add and subtract from left to right.

🔑 UNLOCK the Problem REAL WORLD

A cake recipe calls for 4 cups of flour and 2 cups of sugar. To triple the recipe, how many cups of flour and sugar are needed in all?

Grouping Symbols

Essential Question In what order must operations be evaluated to find a solution when there are parentheses within parentheses?

UNLOCK the Problem · REAL WORLD

Mary's weekly allowance is $8 and David's weekly allowance is $5. Every week they each spend $2 on lunch. Write a numerical expression to show how many weeks it will take them together to save enough money to buy a video game for $45.

- Underline Mary's weekly allowance and how much she spends.
- Circle David's weekly allowance and how much he spends.

Place the First Digit

Essential Question How can you tell where to place the first digit of a quotient without dividing?

COMMON CORE STANDARD CC.5.NBT.6
Perform operations with multi-digit whole numbers and with decimals to hundredths.

⚷ UNLOCK the Problem REAL WORLD

Tania has 8 purple daisies. In all, she counts 128 petals on her flowers. If each flower has the same number of petals, how many petals are on one flower?

- Underline the sentence that tells you what you are trying to find.
- Circle the numbers you need to use.
- How will you use these numbers to solve the problem?

_____

Divide by 1-Digit Divisors

Essential Question How do you solve and check division problems?

⚷ UNLOCK the Problem REAL WORLD

Jenna's family is planning a trip to Oceanside, California. They will begin their trip in Scranton, Pennsylvania, and will travel 2,754 miles over 9 days. If the family travels an equal number of miles every day, how far will they travel each day?

- Underline the sentence that tells you what you are trying to find.
- Circle the numbers you need to use.

Partial Quotients

Essential Question How can you use partial quotients to divide by 2-digit divisors?

Lesson 2.4

🔑 UNLOCK the Problem · REAL WORLD

People in the United States eat about 23 pounds of pizza per person every year. If you ate that much pizza each year, how many years would it take you to eat 775 pounds of pizza?

- Rewrite in one sentence the problem you are asked to solve.

  _____

  _____

Remember

Depending on the question, a remainder may or may not be used in answering the question. Sometimes the quotient is adjusted based on the remainder.

Estimate with 2-Digit Divisors

Essential Question How can you use compatible numbers to estimate quotients?

CONNECT You can estimate quotients using compatible numbers that are found by using basic facts and patterns.

$$35 \div 5 = 7 \quad \leftarrow \text{basic fact}$$
$$350 \div 50 = 7$$
$$3{,}500 \div 50 = 70$$
$$35{,}000 \div 50 = 700$$

? UNLOCK the Problem REAL WORLD

The observation deck of the Willis Tower in Chicago, Illinois, is 1,353 feet above the ground. Elevators lift visitors to that level in 60 seconds. About how many feet do the elevators travel per second?

◀ **Willis Tower, formerly known as the Sears Tower, is the tallest building in the United States.**

Interpret the Remainder

Essential Question When solving a division problem, when do you write the remainder as a fraction?

? UNLOCK the Problem REAL WORLD

Scott and his family want to hike a trail that is 1,365 miles long. They will hike equal parts of the trail on 12 different hiking trips. How many miles will Scott's family hike on each trip?

- Circle the dividend you will use to solve the division problem.
- Underline the divisor you will use to solve the division problem.

When you solve a division problem with a remainder, the way you interpret the remainder depends on the situation and the question. Sometimes you need to use both the quotient and the remainder. You can do that by writing the remainder as a fraction.

Adjust Quotients

Essential Question How can you adjust the quotient if your estimate is too high or too low?

CONNECT When you estimate to decide where to place the first digit, you can also try using the first digit of your estimate to find the first digit of your quotient. Sometimes an estimate is too low or too high.

Divide. 3,382 ÷ 48

Estimate. 3,000 ÷ 50 = 60

Try 6 tens.

If an estimate is too low, the difference will be greater than the divisor.

$$\begin{array}{r} 6 \\ 48\overline{)3{,}382} \\ -2\ 88 \\ \hline 50 \end{array}$$

Since the estimate is too low, adjust by increasing the number in the quotient.

Divide. 453 ÷ 65

Estimate. 490 ÷ 70 = 7

Try 7 ones.

If an estimate is too high, the product with the first digit will be too large and cannot be subtracted.

$$\begin{array}{r} 7 \\ 65\overline{)453} \\ -455 \end{array}$$

Since the estimate is too high, adjust by decreasing the number in the quotient.

🔑 UNLOCK the Problem REAL WORLD

A new music group makes 6,127 copies of its first CD. The group sells 75 copies of the CD at each of its shows. How many shows does it take the group to sell all of the CDs?

Problem Solving • Division

Essential Question How can the strategy *draw a diagram* help you solve a division problem?

🔑 UNLOCK the Problem ▸ REAL WORLD

Sean and his family chartered a fishing boat for the day. Sean caught a blue marlin and an amberjack. The weight of the blue marlin was 12 times as great as the weight of the amberjack. The combined weight of both fish was 273 pounds. How much did each fish weigh?

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?

Solve the Problem

Compare and Order Decimals

Essential Question How can you use place value to compare and order decimals?

🔑 UNLOCK the Problem REAL WORLD

The table lists some of the mountains in the United States that are over two miles high. How does the height of Cloud Mountain in New York compare to the height of Boundary Mountain in Nevada?

Mountain Heights	
Mountain and State	**Height (in miles)**
Boundary, Nevada	2.488
Cloud, New York	2.495
Grand Teton, Wyoming	2.607
Wheeler, New Mexico	2.493

▲ The Tetons are located in Grand Teton National Park.

Round Decimals

Essential Question How can you use place value to round decimals to a given place?

🔑 UNLOCK the Problem REAL WORLD

The Gold Frog of South America is one of the smallest frogs in the world. It is 0.386 of an inch long. What is this length rounded to the nearest hundredth of an inch?

- Underline the length of the Gold Frog.
- Is the frog's length about the same as the length or the width of a large paper clip?

_____

The Little Grass Frog is the smallest frog in North America. It is 0.437 of an inch long.

A What is the length of the frog to the nearest hundredth of an inch?

B What is the length of the frog to the nearest tenth of an inch?

Add Decimals

Essential Question How can place value help you add decimals?

🔑 UNLOCK the Problem REAL WORLD

Henry recorded the amount of rain that fell over 2 hours.
In the first hour, Henry measured 2.35 centimeters of rain.
In the second hour, he measured 1.82 centimeters of rain.

Henry estimated that about 4 centimeters of rain fell in 2 hours.
What is the total amount of rain that fell? How can you use
this estimate to decide if your answer is reasonable?

Subtract Decimals

Essential Question How can place value help you subtract decimals?

UNLOCK the Problem REAL WORLD

Hannah has 3.36 kilograms of apples and 2.28 kilograms of oranges. Hannah estimates she has about 1 more kilogram of apples than oranges. How many more kilograms of apples than oranges does Hannah have? How can you use this estimate to decide if your answer is reasonable?

- What operation will you use to solve the problem?

  _____

- Circle Hannah's estimate to check that your answer is reasonable.

Patterns with Decimals

Essential Question How can you use addition or subtraction to describe a pattern or create a sequence with decimals?

? UNLOCK the Problem REAL WORLD

A state park rents canoes for guests to use at the lake. It costs $5.00 to rent a canoe for 1 hour, $6.75 for 2 hours, $8.50 for 3 hours, and $10.25 for 4 hours. If this pattern continues, how much should it cost Jason to rent a canoe for 7 hours?

A **sequence** is an ordered list of numbers. A **term** is each number in a sequence. You can find the pattern in a sequence by comparing one term with the next term.

• What observation can you make about the pattern in the sequence that will help you write a rule?

_____

_____

Problem Solving • Add and Subtract Money

Essential Question How can the strategy *make a table* help you organize and keep track of your bank account balance?

COMMON CORE STANDARD CC.5.NBT.7
Perform operations with multi-digit whole numbers and with decimals to hundredths.

🔑 UNLOCK the Problem REAL WORLD

At the end of May, Mrs. Freeman had an account balance of $442.37. Since then, she has written a check for $63.92 and made a deposit of $350.00. Mrs. Freeman says she has $729.45 in her account. Make a table to determine if Mrs. Freeman is correct.

Read the Problem	Solve the Problem
What do I need to find?	

Mrs. Freeman's Checkbook

May balance			$442.37
Check	$63.92		−$63.92
Deposit		$350.00	

What information do I need to use?

How will I use the information?

$$\underline{}$$
$$+\underline{}$$

- How can you tell if your answer is reasonable? _____

Multiplication with Decimals and Whole Numbers

COMMON CORE STANDARDS CC.5.NBT.2, CC.5.NBT.7
Perform operations with multi-digit whole numbers and with decimals to hundredths.

Essential Question How can you use drawings and place value to multiply a decimal and a whole number?

UNLOCK the Problem REAL WORLD

In 2010, the United States Mint released a newly designed Lincoln penny. A Lincoln penny has a mass of 2.5 grams. If there are 5 Lincoln pennies on a tray, what is the total mass of the pennies?

- How much mass does one penny have?

  _____

- How many pennies are on the tray?

  _____

- Use grouping language to describe what you are asked to find.

  _____

Multiply Using Expanded Form

Essential Question How can you use expanded form and place value to multiply a decimal and a whole number?

? UNLOCK the Problem REAL WORLD

The length of a day is the amount of time it takes a planet to make a complete rotation on its axis. On Jupiter, there are 9.8 Earth hours in a day. How many Earth hours are there in 46 days on Jupiter?

▲ A day on Jupiter is called a Jovian day.

- **What if** you wanted to find the number of Earth hours in 125 days on Jupiter? How would your model change?

_____

_____

Name

Problem Solving • Multiply Money

Essential Question How can the strategy *draw a diagram* help you solve a decimal multiplication problem?

COMMON CORE STANDARD CC.5.NBT.7
Perform operations with multi-digit whole numbers and with decimals to hundredths.

?UNLOCK the Problem · REAL WORLD

A group of friends go to a local fair. Jayson spends $3.75. Maya spends 3 times as much as Jayson. Tia spends $5.25 more than Maya. How much does Tia spend?

Use the graphic organizer below to help you solve the problem.

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

© Houghton Mifflin Harcourt Publishing Company

Chapter 4   177

Multiply Decimals

Essential Question What strategies can you use to place a decimal point in a product?

CONNECT You can use what you have learned about patterns and place value to place the decimal point in the product when you multiply two decimals.

$1 \times 0.1 = 0.1$

$0.1 \times 0.1 = 0.01$

$0.01 \times 0.1 = 0.001$

Remember

When a number is multiplied by a decimal, the decimal point moves one place to the left in the product for each decreasing place value being multiplied.

🔑 UNLOCK the Problem REAL WORLD

A male leopard seal is measured and has a length of 2.8 meters. A male elephant seal is about 1.5 times as long. What length is the male elephant seal?

- **What if** you multiplied 2.8 by 1.74? What would be the place value of the product? **Explain** your answer.

_____

_____

Zeros in the Product

Essential Question How do you know you have the correct number of decimal places in your product?

UNLOCK the Problem REAL WORLD

CONNECT When decimals are multiplied, the product may not have enough digits to place the decimal point. In these cases, you may need to write additional zeros.

Students are racing typical garden snails and measuring the distance the snails travel in 1 minute. Chris's snail travels a distance of 0.2 foot. Jamie's snail travels 0.4 times as far as Chris's snail. How far does Jamie's snail travel?

- Using the given information, describe what you are being asked to find.

  _____

  _____

  _____

Division Patterns with Decimals

Essential Question How can patterns help you place the decimal point in a quotient?

🔑 UNLOCK the Problem REAL WORLD

The Healthy Wheat Bakery uses 560 pounds of flour to make 1,000 loaves of bread. Each loaf contains the same amount of flour. How many pounds of flour are used in each loaf of bread?

You can use powers of ten to help you find quotients. Dividing by a power of 10 is the same as multiplying by 0.1, 0.01, or 0.001.

- • Underline the sentence that tells you what you are trying to find.
- • Circle the numbers you need to use.

Remember

The zero power of 10 equals 1.

$$10^0 = 1$$

The first power of 10 equals 10.

$$10^1 = 10$$

Name _____

Estimate Quotients

Essential Question How can you estimate decimal quotients?

🔑 UNLOCK the Problem REAL WORLD

Carmen likes to ski. The ski resort where she goes to ski got 3.2 feet of snow during a 5-day period. The *average* daily snowfall for a given number of days is the quotient of the total amount of snow and the number of days. Estimate the average daily snowfall.

You can estimate decimal quotients by using compatible numbers. When choosing compatible numbers, you can look at the whole-number part of a decimal dividend or rename the decimal dividend as tenths or hundredths.

1. Whose estimate do you think is closer to the exact quotient?

Explain your reasoning. _____

_____

2. Explain how you would rename the dividend in 29.7 ÷ 40 to choose compatible numbers and estimate the quotient.

_____

_____

Division of Decimals by Whole Numbers

Essential Question How can you divide decimals by whole numbers?

🔑 UNLOCK the Problem REAL WORLD

In a swimming relay, each swimmer swims an equal part of the total distance. Brianna and 3 other swimmers won a relay in 5.68 minutes. What is the average time each girl swam?

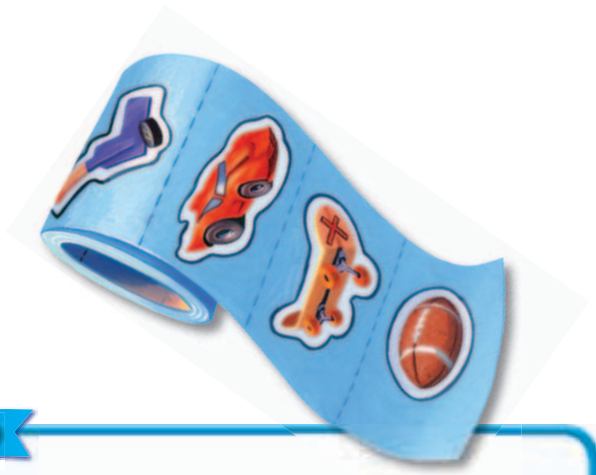● How many swimmers are part of the relay team?

_____

Divide Decimals

Essential Question How can you place the decimal point
in the quotient?

When you multiply both the divisor and the dividend by the
same power of 10, the quotient stays the same.

divisor		dividend			divisor		dividend	
6	÷	3	= 2		120	÷	30	= 4
↓ × 10		↓ × 10			↓ × 0.1		↓ × 0.1	
60	÷	30	= 2		12	÷	3	= 4
↓ × 10		↓ × 10			↓ × 0.1		↓ × 0.1	
600	÷	300	= 2		1.2	÷	0.3	= 4

🔑 UNLOCK the Problem REAL WORLD

Matthew has $0.72. He wants to buy stickers that cost
$0.08 each. How many stickers can he buy?

- What do you multiply hundredths by
  to get a whole number?

  _____

- **Explain** how you know that the quotient 0.72 ÷ 0.08 is equal to the
  quotient 72 ÷ 8.

  _____

  _____

Try This! **Divide.** 0.56 ÷ 0.7

Write Zeros in the Dividend

Essential Question When do you write a zero in the dividend to find a quotient?

CONNECT When decimals are divided, the dividend may not have enough digits for you to complete the division. In these cases, you can write zeros to the right of the last digit.

UNLOCK the Problem REAL WORLD

The equivalent fractions show that writing zeros to the right of a decimal does not change the value.

$$90.8 = 90\frac{8 \times 10}{10 \times 10} = 90\frac{80}{100} = 90.80$$

During a fund-raising event, Adrian rode his bicycle 45.8 miles in 4 hours. Find his speed in miles per hour.

Problem Solving • Decimal Operations

Essential Question How do you use the strategy *work backward* to solve multistep decimal problems?

🔑 UNLOCK the Problem 〉REAL WORLD〈

Carson spent $15.99 for 2 books and 3 pens. The books cost $4.95 each and sales tax was $1.22. Carson also used a coupon for $0.50 off his purchase. If each pen had the same cost, how much did each pen cost?

Read the Problem

What do I need to find?	**What information do I need to use?**	**How will I use the information?**

Solve the Problem

Name _____

Common Denominators and Equivalent Fractions

Essential Question How can you rewrite a pair of fractions so that they have a common denominator?

🔑 UNLOCK the Problem REAL WORLD

Sarah planted two 1-acre gardens. One had three sections of flowers and the other had 4 sections of flowers. She plans to divide both gardens into more sections so that they have the same number of equal-sized sections. How many sections will each garden have?

You can use a **common denominator** or a common multiple of two or more denominators to write fractions that name the same part of a whole.
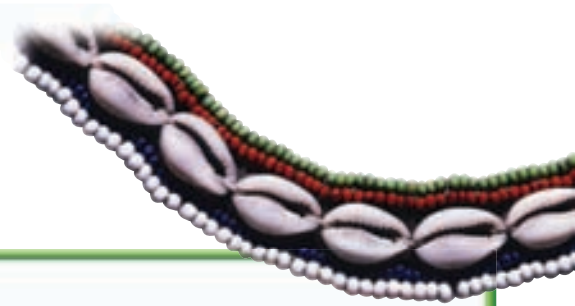
Name _____

Add and Subtract Fractions

Essential Question How can you use a common denominator to add and subtract fractions with unlike denominators?

CONNECT You can use what you have learned about common denominators to add or subtract fractions with unlike denominators.

🔑 UNLOCK the Problem REAL WORLD

Malia bought shell beads and glass beads to weave into designs in her baskets. She bought $\frac{1}{4}$ pound of shell beads and $\frac{3}{8}$ pound of glass beads. How many pounds of beads did she buy?

- Underline the question you need to answer.
- Draw a circle around the information you will use.

- **Explain** how you know whether your answer is reasonable. _____

_____

Subtract. $\frac{9}{10} - \frac{2}{5}$ **Write your answer in simplest form.**

Describe the steps you took to solve the problem.

_____

_____

_____

_____

2. Explain how you know whether your answer is reasonable.

_____

_____

Name _____

Add and Subtract Mixed Numbers

Essential Question How can you add and subtract mixed numbers with unlike denominators?

🔑 UNLOCK the Problem REAL WORLD

Denise mixed $1\frac{4}{5}$ ounces of blue paint with $2\frac{1}{10}$ ounces of yellow paint. How many ounces of paint did Denise mix?

- What operation should you use to solve the problem?

  _____

- Do the fractions have the same denominator?

  _____

1. Explain how you know whether your answer is reasonable. _____

_____

_____

2. What other common denominator could you have used? _____

_____

Subtract. $4\frac{5}{6} - 2\frac{3}{4}$

3. **Explain** how you know whether your answer is reasonable. _____

_____

_____

Patterns with Fractions

Essential Question How can you use addition or subtraction to describe a pattern or create a sequence with fractions?

? UNLOCK the Problem REAL WORLD

Mr. Patrick wants to develop a new chili recipe for his restaurant. Each batch he makes uses a different amount of chili powder. The first batch uses $3\frac{1}{2}$ ounces, the second batch uses $4\frac{5}{6}$ ounces, the third uses $6\frac{1}{6}$ ounces, and the fourth uses $7\frac{1}{2}$ ounces. If this pattern continues, how much chili powder will he use in the sixth batch?

Problem Solving
Practice Addition and Subtraction

Essential Question How can the strategy *work backward* help you solve a problem with fractions that involves addition and subtraction?

🔑 UNLOCK the Problem REAL WORLD

The Diaz family is cross-country skiing the Big Tree trails, which have a total length of 4 miles. Yesterday, they skied the $\frac{7}{10}$ mile Oak Trail. Today, they skied the $\frac{3}{5}$ mile Pine Trail. If they plan to ski all of the Big Tree trails, how many more miles do they have left to ski?

Use the graphic organizer to help you solve the problem.

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?

Solve the Problem

- **Explain** how you know your answer is reasonable. _____

_____

Use Properties of Addition

Essential Question How can properties help you add fractions with unlike denominators?

CONNECT You can use properties of addition to help you add fractions with unlike denominators.

Commutative Property: $\frac{1}{2} + \frac{3}{5} = \frac{3}{5} + \frac{1}{2}$

Associative Property: $\left(\frac{2}{9} + \frac{1}{8}\right) + \frac{3}{8} = \frac{2}{9} + \left(\frac{1}{8} + \frac{3}{8}\right)$

Remember
Parentheses ( ) tell which operation to do first.

UNLOCK the Problem REAL WORLD

Jane and her family are driving to Big Lagoon State Park. On the first day, they travel $\frac{1}{3}$ of the total distance. On the second day, they travel $\frac{1}{3}$ of the total distance in the morning and then $\frac{1}{6}$ of the total distance in the afternoon. How much of the total distance has Jane's family driven by the end of the second day?

Find Part of a Group

Essential Question How can you find a fractional part of a group?

🔑 UNLOCK the Problem REAL WORLD

Maya collects stamps. She has 20 stamps in her collection. Four-fifths of her stamps have been canceled. How many of the stamps in Maya's collection have been canceled?

▲ The post office cancels stamps to keep them from being reused.

Name _____

Fraction and Whole Number Multiplication

Essential Question How can you find the product of a fraction and a whole number without using a model?

🔑 UNLOCK the Problem REAL WORLD

Charlene has five 1-pound bags of different color sands. For an art project, she will use $\frac{3}{8}$ pound of each bag of sand to create a colorful sand-art jar. How much sand will be in Charlene's sand-art jar?

- How much sand is in each bag?

  _____

- Will Charlene use all of the sand in each bag? Explain.

  _____

Name _____

Fraction Multiplication

Essential Question How do you multiply fractions?

🔑 UNLOCK the Problem REAL WORLD

Sasha has $\frac{3}{5}$ of a scarf left to knit. If she finishes $\frac{1}{2}$ of that today, how much of the scarf will Sasha knit today?

- How much of the scarf does Sasha have left to knit?

  _____

- Of the fraction that is left, how much will she finish today?

  _____

Compare Mixed Number Factors and Products

Essential Question How does the size of the product compare to the size of one factor when multiplying fractions greater than one?

UNLOCK the Problem REAL WORLD

You can make generalizations about the relative size of a product when one factor is equal to 1, less than 1, or greater than 1.

Jane has a recipe that calls for $1\frac{1}{4}$ cups of flour. She wants to know how much flour she would need if she made the recipe as written, if she made half the recipe, and if she made $1\frac{1}{2}$ times the recipe.

Multiply Mixed Numbers

Essential Question How do you multiply mixed numbers?

? UNLOCK the Problem REAL WORLD

One-third of a $1\frac{1}{4}$ acre park has been set aside as a dog park. Find the number of acres that are used as a dog park.

- Is the area of the dog park less than or greater than the area of the $1\frac{1}{4}$ acre park?

  _____

Problem Solving • Find Unknown Lengths

Essential Question How can you use the strategy *guess, check, and revise* to solve problems with fractions?

COMMON CORE STANDARD CC.5.NF.5b
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

🔑 UNLOCK the Problem REAL WORLD
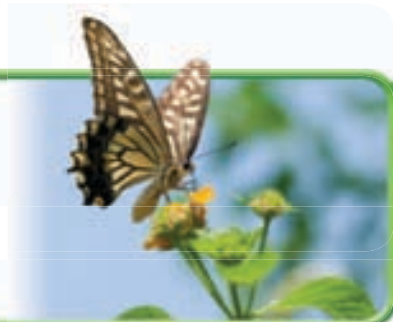
Sarah wants to design a rectangular garden with a section for flowers that attract butterflies. She wants the area of this section to be $\frac{3}{4}$ square yard. If she wants the width to be $\frac{1}{3}$ the length, what will the dimensions of the butterfly section be?

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?

Solve the Problem

Name _____

Problem Solving • Use Multiplication

Essential Question How can the strategy *draw a diagram* help you solve fraction division problems by writing a multiplication sentence?

? UNLOCK the Problem REAL WORLD

Erica makes 6 submarine sandwiches and cuts each sandwich into thirds. How many $\frac{1}{3}$-size sandwich pieces does she have?

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

Connect Fractions to Division

Essential Question How does a fraction represent division?

COMMON CORE STANDARD CC.5.NF.3
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

CONNECT A fraction can be written as a division problem.

$$\frac{3}{4} = 3 \div 4 \qquad \frac{12}{2} = 12 \div 2$$

🔑 UNLOCK the Problem REAL WORLD

There are 3 students in a crafts class and 2 sheets of construction paper for them to share equally. What part of the construction paper will each student get?

- Circle the dividend.
- Underline the divisor.

Name _____

Fraction and Whole-Number Division

Essential Question How can you divide fractions by solving a related multiplication sentence?

🔑 UNLOCK the Problem REAL WORLD

Three friends share a $\frac{1}{4}$-pound block of fudge equally. What fraction of a pound of fudge does each friend get?

Brad has 9 pounds of ground turkey to make turkey burgers for a picnic. How many $\frac{1}{3}$-pound turkey burgers can he make?

- Will the number of turkey burgers be less than or greater than 9?

_____

Line Plots

Essential Question How can a line plot help you find an average with data given in fractions?

UNLOCK the Problem REAL WORLD

Students have measured different amounts of water into beakers for an experiment. The amount of water in each beaker is listed below.

$\frac{1}{4}$ cup, $\frac{1}{4}$ cup, $\frac{1}{2}$ cup, $\frac{3}{4}$ cup, $\frac{1}{4}$ cup, $\frac{1}{4}$ cup,

$\frac{1}{4}$ cup, $\frac{1}{2}$ cup, $\frac{1}{4}$ cup, $\frac{3}{4}$ cup, $\frac{1}{4}$ cup, $\frac{3}{4}$ cup

If the total amount of water stayed the same, what would be the average amount of water in a beaker?

$$
\begin{array}{ccc}
\;+\!+\!+ \\
\frac{1}{4} & \frac{1}{2} & \frac{3}{4}
\end{array}
$$

Water Used (in cups)
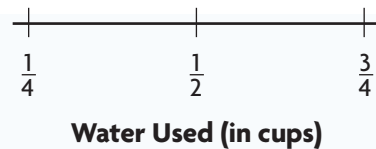
Ordered Pairs

Essential Question How can you identify and plot points on a coordinate grid?

CONNECT Locating a point on a coordinate grid is similar to describing directions using North-South and West-East. The horizontal number line on the grid is the **x-axis**. The vertical number line on the grid is the **y-axis**.

Each point on the coordinate grid can be described by an **ordered pair** of numbers. The **x-coordinate**, the first number in the ordered pair, is the horizontal location, or the distance the point is from 0 in the direction of the x-axis. The **y-coordinate**, the second number in the ordered pair, is the vertical location, or the distance the point is from 0 in the direction of the y-axis.

(x, y)

x-coordinate — y-coordinate
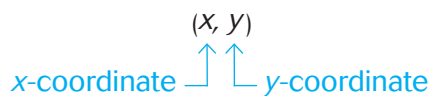
The x-axis and the y-axis intersect at the point (0, 0), called the **origin**.

UNLOCK the Problem REAL WORLD

Write the ordered pairs for the locations of the arena and the aquarium.
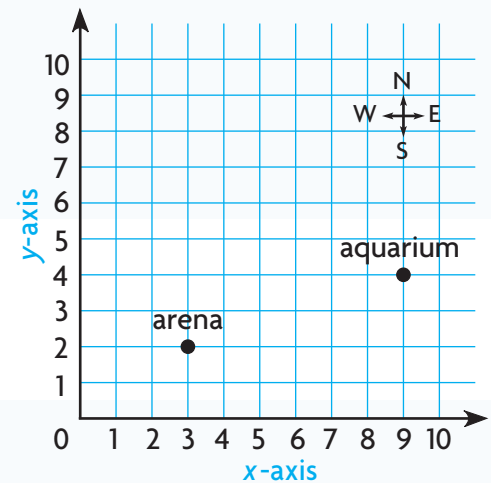
- Describe the path you would take to get from the origin to the aquarium, using horizontal, then vertical movements.

_____

_____

Name _____

Numerical Patterns

Essential Question How can you identify a relationship between two numerical patterns?

🔑 UNLOCK the Problem REAL WORLD 🌐

On the first week of school, Joel purchases 2 movies and 6 songs from his favorite media website. If he purchases the same number of movies and songs each week, how does the number of songs purchased compare to the number of movies purchased from one week to the next?

- How many movies does Joel purchase each week?

  _____

- How many songs does Joel purchase each week?

  _____

Problem Solving • Find a Rule

Essential Question How can you use the strategy *solve a simpler problem* to help you solve a problem with patterns?

🔑 UNLOCK the Problem REAL WORLD

On an archaeological dig, Gabriel separates his dig site into sections with areas of 15 square feet each. There are 3 archaeological members digging in every section. What is the area of the dig site if 21 members are digging at one time?

15 sq ft

Read the Problem

What do I need to find?	What information do I need to use?	How will I use the information?

Solve the Problem

Customary Length

Essential Question How can you compare and convert customary units of length?

? UNLOCK the Problem REAL WORLD

To build a new swing, Mr. Mattson needs 9 feet of rope for each side of the swing and 6 more feet for the monkey bar. The hardware store sells rope by the yard.

- How many feet of rope does Mr. Mattson need for the swing?

- How many feet does Mr. Mattson need for the swing and the monkey bar combined?

A 12-inch ruler is 1 foot.		

A yardstick is 1 yard.

Customary Capacity

Essential Question How can you compare and convert customary units of capacity?

UNLOCK the Problem REAL WORLD

Mara has a can of paint with 3 cups of purple paint in it. She also has a bucket with a capacity of 26 fluid ounces. Will the bucket hold all of the paint Mara has?

The **capacity** of a container is the amount the container can hold.
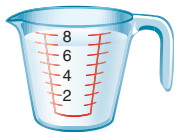
1 cup (c) = _____ fluid ounces (fl oz)

- What capacity does Mara need to convert?

  _____

- After Mara converts the units, what does she need to do next?

  _____

  _____

- **What if** Mara has 7 cups of green paint and a container filled with 64 fluid ounces of yellow paint? Which color paint does Mara have more of? **Explain** your reasoning.

  _____

  _____

Weight

Essential Question How can you compare and convert customary units of weight?

COMMON CORE STANDARD CC.5.MD.1
Convert like measurement units within a given measurement system.

🔑 UNLOCK the Problem REAL WORLD

Hector's school is having a model rocket competition. To qualify, each rocket must weigh 4 pounds or less. Hector's unpainted rocket weighs 62 ounces. What is the weight of the most paint he can use for his model rocket to qualify for entry?
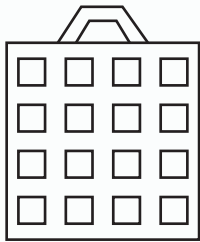
- What weight does Hector need to convert?

  _____

- After Hector converts the weight, what does he need to do next?

  _____

1 pound = _____ ounces

Problem Solving
Customary and Metric Conversions

Essential Question How can you use the strategy *make a table* to help you solve problems about customary and metric conversions?

COMMON CORE STANDARD CC.5.MD.1
Convert like measurement units within a given measurement system.

🔑 UNLOCK the Problem REAL WORLD

Aaron is making fruit punch for a family reunion. He needs to make 120 cups of punch. If he wants to store the fruit punch in gallon containers, how many gallon containers will Aaron need?

Use the graphic organizer below to help you solve the problem.

Conversion Table

	gal	qt	pt	c
1 gal	1	4	8	16
1 qt	$\frac{1}{4}$	1	2	4
1 pt	$\frac{1}{8}$	$\frac{1}{2}$	1	2
1 c	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{1}{2}$	1

Read the Problem

What do I need to find?	**What information do I need to use?**	**How will I use the information?**

Solve the Problem

- Will all of the gallon containers Aaron uses be filled to capacity? **Explain**. _____

_____

Elapsed Time

Essential Question How can you solve elapsed time problems by converting units of time?

🔑 UNLOCK the Problem REAL WORLD

A computer company claims its laptop has a battery that lasts 4 hours. The laptop actually ran for 200 minutes before the battery ran out. Did the battery last 4 hours?

Try This!

Jill spent much of her summer away from home. She spent 10 days with her grandparents, 9 days with her cousins, and 22 days at camp. How many weeks and days was she away from home?

Units of Time
60 seconds (s) = 1 minute (min)
60 minutes = 1 hour (hr)
24 hours = 1 day (d)
7 days = 1 week (wk)
52 weeks = 1 year (yr)
12 months (mo) = 1 year
365 days = 1 year

Problem Solving

Properties of Two-Dimensional Figures

COMMON CORE STANDARD CC.5.G.3
Classify two-dimensional figures into categories based on their properties.

Essential Question How can you use the strategy *act it out* to approximate whether the sides of a figure are congruent?

UNLOCK the Problem REAL WORLD

Lori has a quadrilateral with vertices *A, B, C*, and *D*. The quadrilateral has four right angles. She wants to show that quadrilateral *ABCD* is a square, but she does not have a ruler to measure the lengths of the sides. How can she show that the quadrilateral has four congruent sides and is a square?
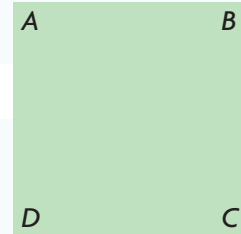
Use the graphic organizer below to help you solve the problem.

A   B

D   C

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

- What else do you need to do to solve the problem?

_____

_____

Volume of Rectangular Prisms

Essential Question How can you find the volume of
a rectangular prism?

CONNECT The base of a rectangular prism is a rectangle.
You know that area is measured in square units, or units^2,
and that the area of a rectangle can be found by multiplying
the length and the width.

Volume is measured in cubic units, or units^3. When you
build a prism and add each layer of cubes, you are adding
a third dimension, height.
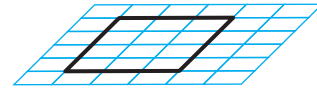
The area of the base

is _____ sq units.

UNLOCK the Problem REAL WORLD

Sid built the rectangular prism shown at the right, using
1-inch cubes. The prism has a base that is a rectangle
and has a height of 4 cubes. What is the volume of the
rectangular prism that Sid built?
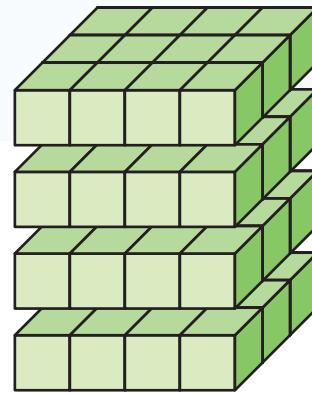
1. How does the volume change as each layer is added?

_____

_____

2. What does the number you multiply the height by represent?

_____

_____

Apply Volume Formulas

Essential Question How can you use a formula to find the volume of a rectangular prism?

CONNECT Both prisms show the same dimensions and have the same volume.
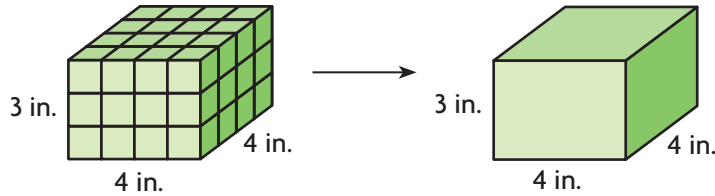
3 in.   4 in.   4 in.

3 in.   4 in.   4 in.

🔑 **UNLOCK the Problem** REAL WORLD

Mike is making a box to hold his favorite DVDs. The length of the box is 7 inches, the width is 5 inches and the height is 3 inches. What is the volume of the box Mike is making?

- Underline what you are asked to find.
- Circle the numbers you need to use to solve the problem.

Name _____

Problem Solving • Compare Volumes

Essential Question: How can you use the strategy *make a table* to compare different rectangular prisms with the same volume?

🔑 UNLOCK the Problem REAL WORLD

Adam has 50 one-inch cubes. The cubes measure 1 inch on each edge. Adam wonders how many rectangular prisms, each with a different-size base, that he could make with all of the one-inch cubes.

Use the graphic organizer below to help you solve the problem.

Read the Problem	Solve the Problem
What do I need to find?	**Complete the table.**

Solve the Problem — Complete the table.

Base (sq in.)	Height (in.)	Volume (cu in.)
(1×1)	50	$(1 \times 1) \times 50 = 50$
(1×2)	25	$(1 \times 2) \times 25 = 50$
(1×5)	10	$(1 \times 5) \times 10 = 50$
(1×10)	5	$(1 \times 10) \times 5 = 50$
(1×25)	2	$(1 \times 25) \times 2 = 50$
(1×50)	1	$(1 \times 50) \times 1 = 50$

What information do I need to use?

How will I use the information?

1. What else do you need to do to solve the problem? _____

_____

2. How many rectangular prisms with different bases can Adam make

using fifty one-inch cubes? _____

Find Volume of Composed Figures
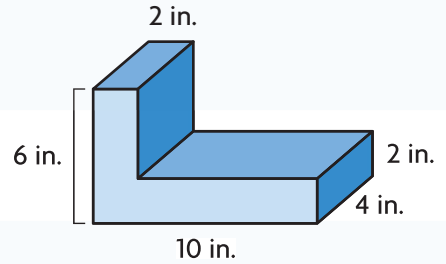
Essential Question How can you find the volume of rectangular
prisms that are combined?

🔑 UNLOCK the Problem REAL WORLD

The shape at the right is a composite figure. It is made
up of two rectangular prisms that are combined. How
can you find the volume of the figure?

2 in.

6 in.

2 in.

4 in.

10 in.

• What is another way you could divide the composite figure into

  two rectangular prisms? _____

_____