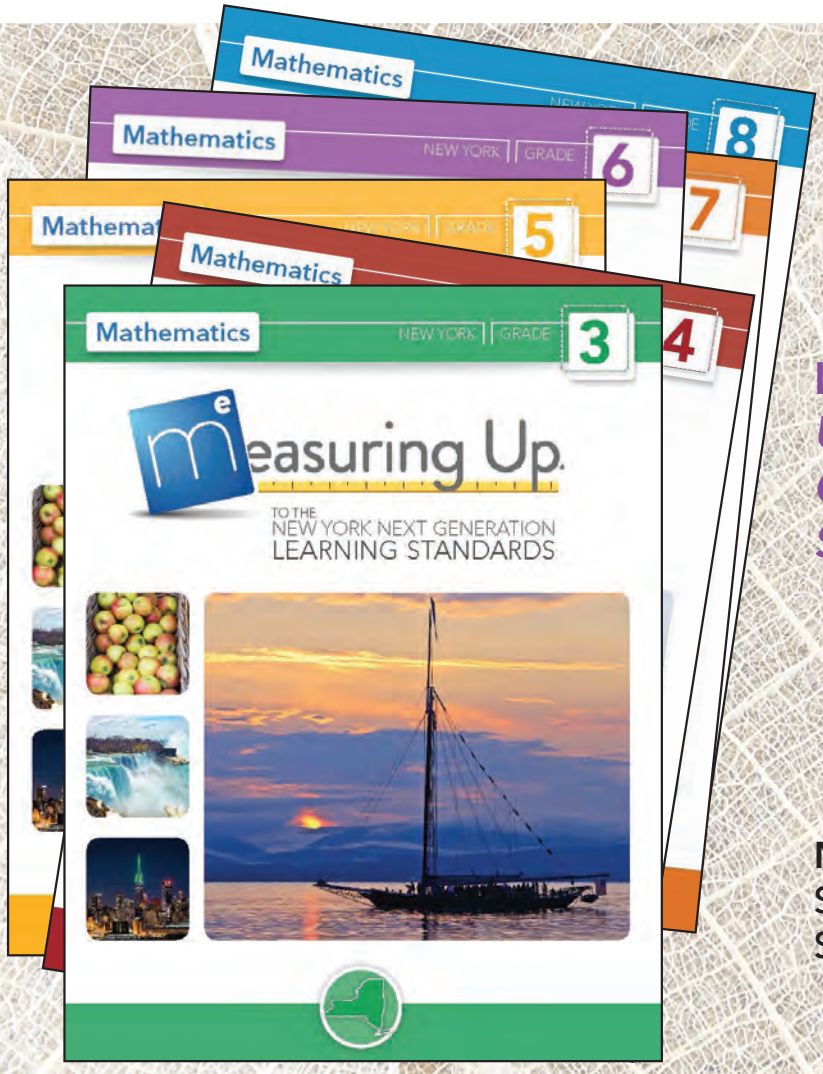
NEW!

Measuring Up®

to the New York NEXT GENERATION LEARNING STANDARDS

available for
English Language Arts and Mathematics
Grades 3–8



Math Available Now!

Learn About the Measuring Up to the New York Next Generation Learning Standards for Mathematics!

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Measuring Up

NEW!

Mathematics

Grades 3-8

Based on feedback from NY educators, powerful changes have been made to the new ***Measuring Up*** books written to the NY Next Generation Learning Standards which includes the change in grade level standards to improve the focus of major content and skills for each grade. The lesson pedagogy invites students to explore math standards with a goal to build foundation for mastery. Activities support the need to balance conceptual understanding, procedural skill and application while incorporating the mathematical practices into the skills lessons.

Lesson pedagogy invites students to explore math standards with a goal to build foundation for mastery. Each grade addresses all of the NY Next Generation Learning Standards. Each grade level builds on the content covered in the previous grade level. Within each chapter, each lesson builds on content in the previous lesson.

Grade 3, Math

Grade 8, Math

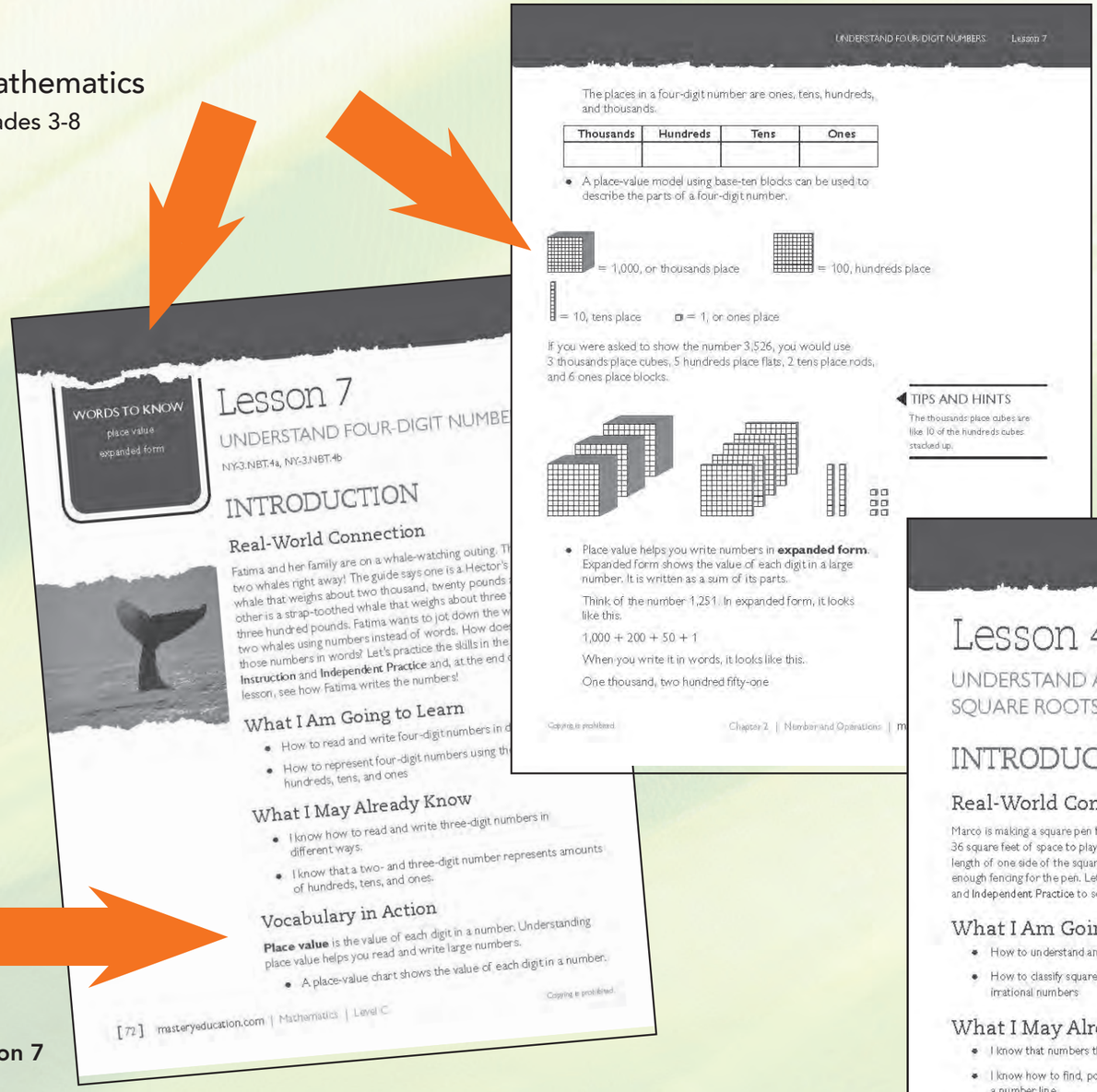
Measuring Up®

Mathematics
Grades 3-8

What's New?

Academic Language Supports Learning Complex Content and Abstract Ideas

- **Words to Know**—lists the academic vocabulary related to the lesson
- **Vocabulary In Action**—provides the academic vocabulary in context



Grade 3, Lesson 7

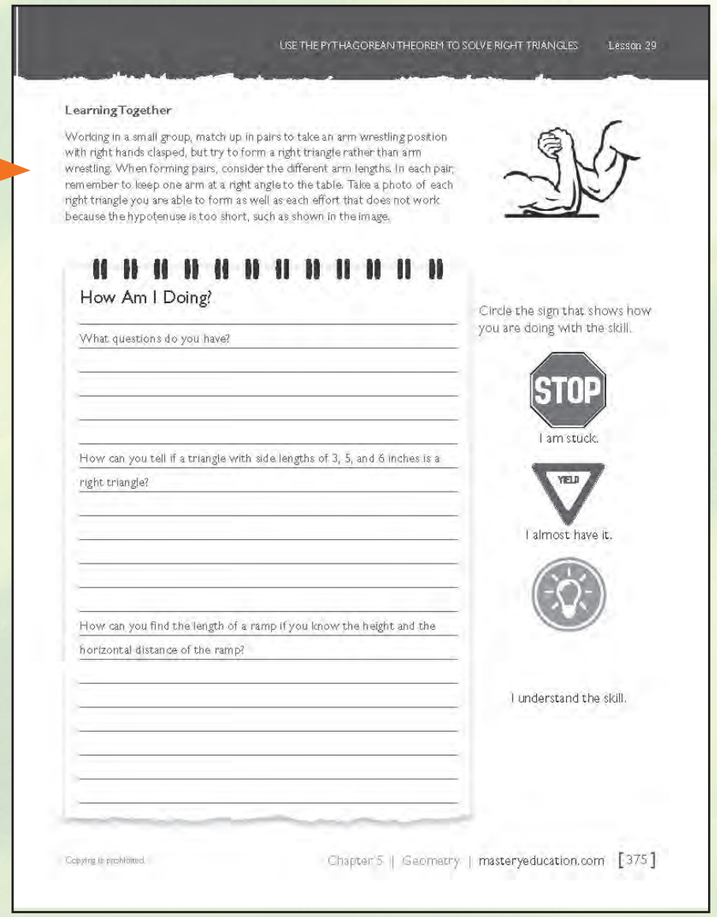
Grade 8, Lesson 4

Measuring Up

Mathematics

Grades 3-8

Specific opportunities for collaborative learning with examples to model, **Turn and Talk** and **Learning Together.**



USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES Lesson 29

Learning Together

Working in a small group, match up in pairs to take an arm wrestling position with right hands clasped, but try to form a right triangle rather than arm wrestling. When forming pairs, consider the different arm lengths. In each pair, remember to keep one arm at a right angle to the table. Take a photo of each right triangle you are able to form as well as each effort that does not work because the hypotenuse is too short, such as shown in the image.

How Am I Doing?

What questions do you have?

How can you tell if a triangle with side lengths of 3, 5, and 6 inches is a right triangle?

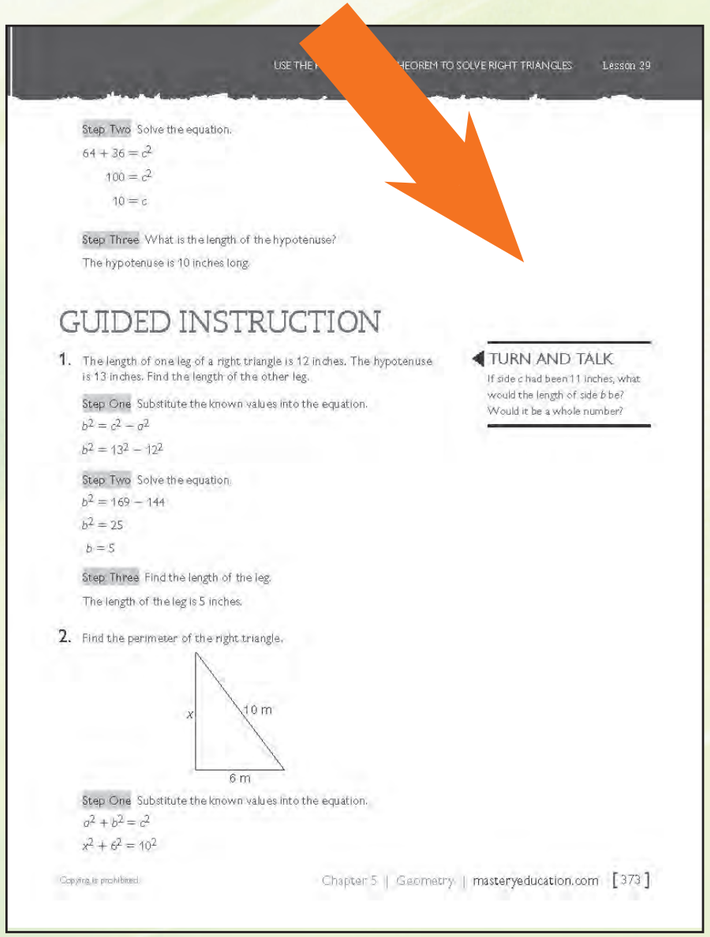
How can you find the length of a ramp if you know the height and the horizontal distance of the ramp?

Circle the sign that shows how you are doing with the skill.

I am stuck.

I almost have it.

I understand the skill.



USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES Lesson 29

Step Two Solve the equation.

$64 + 36 = c^2$

$100 = c^2$

$10 = c$

Step Three What is the length of the hypotenuse?

The hypotenuse is 10 inches long.

GUIDED INSTRUCTION

1. The length of one leg of a right triangle is 12 inches. The hypotenuse is 13 inches. Find the length of the other leg.

Step One Substitute the known values into the equation.

$b^2 = c^2 - a^2$

$b^2 = 13^2 - 12^2$

Step Two Solve the equation.

$b^2 = 169 - 144$

$b^2 = 25$

$b = 5$

Step Three Find the length of the leg.

The length of the leg is 5 inches.

TURN AND TALK

If side c had been 11 inches, what would the length of side b be? Would it be a whole number?

2. Find the perimeter of the right triangle.

Step One Substitute the known values into the equation.

$a^2 + b^2 = c^2$

$x^2 + 6^2 = 10^2$

Grade 8, Lesson 29

Measuring Up®

Mathematics
Grades 3-8

Activities support the need to balance conceptual understanding, procedural skill and application.

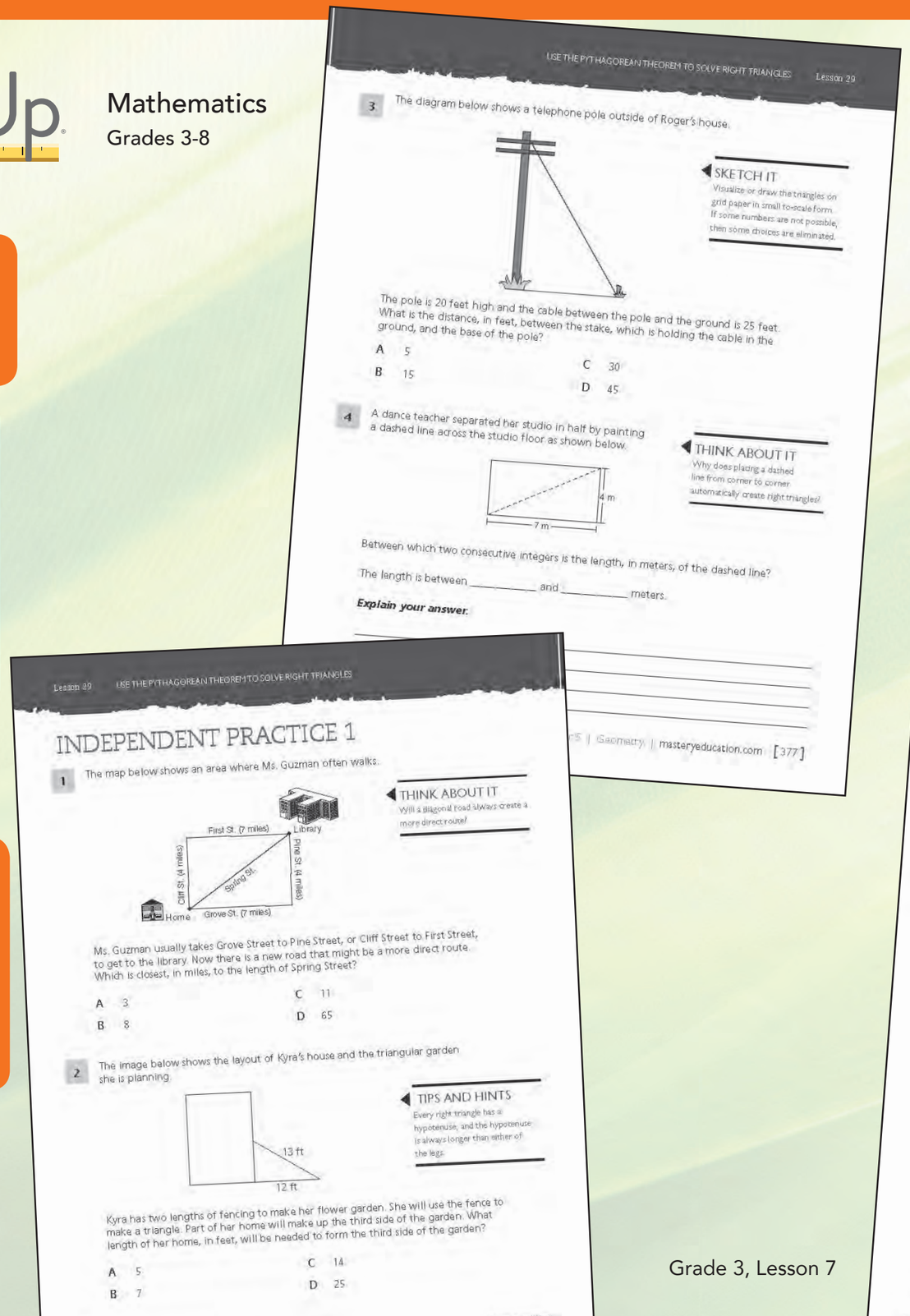
The questions in the activities encompass a variety of levels.

In both **Independent Practice I** and **II**, you will find multiple choice questions that ask for basic application (DOK 1 and DOK 2), as well as procedural skill questions (DOK 2 and DOK 3), and conceptual understanding questions (DOK 3).

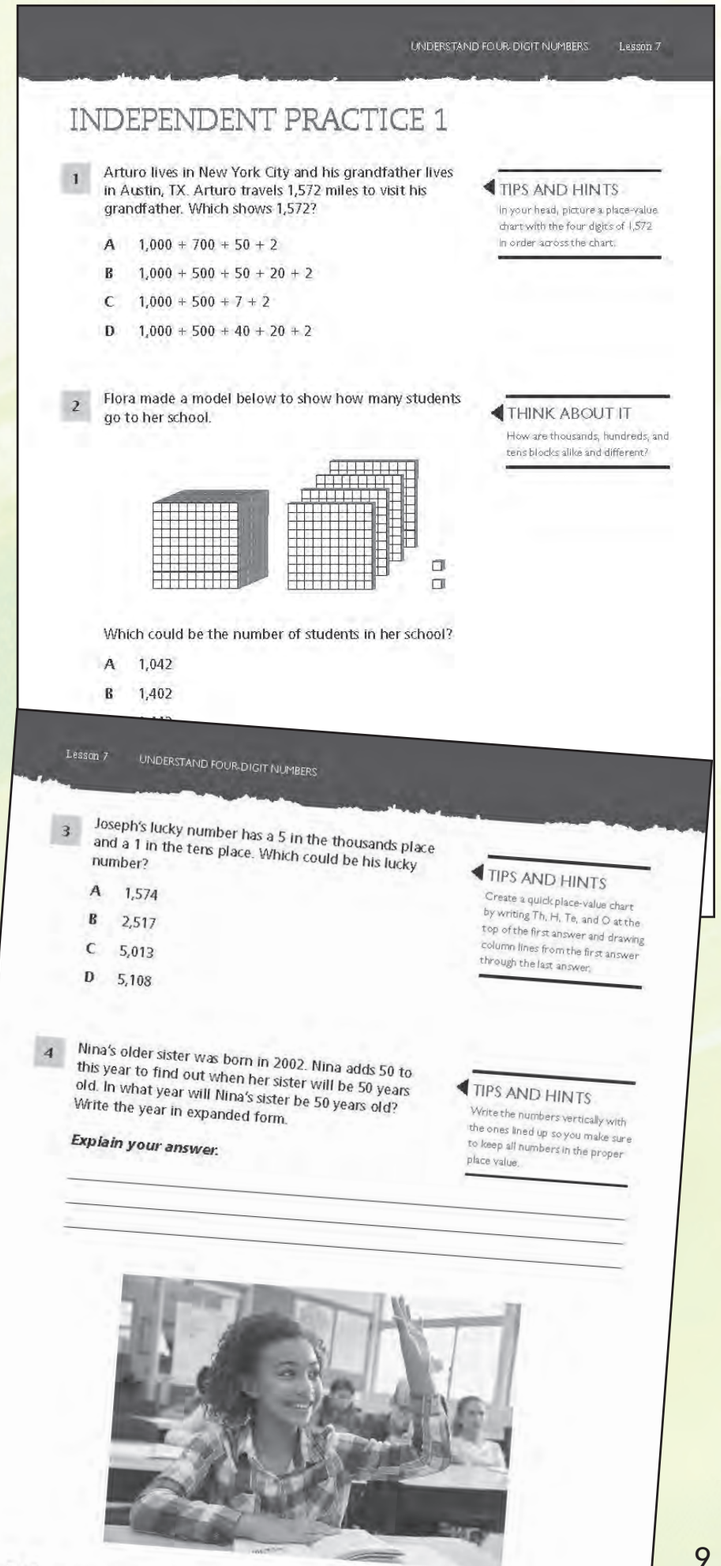
Independent Practice I

Includes questions at a mix of levels that include question supports. Items includes multiple choice and constructed response items.

Grade 8, Lesson 29



Grade 3, Lesson 7



Measuring Up

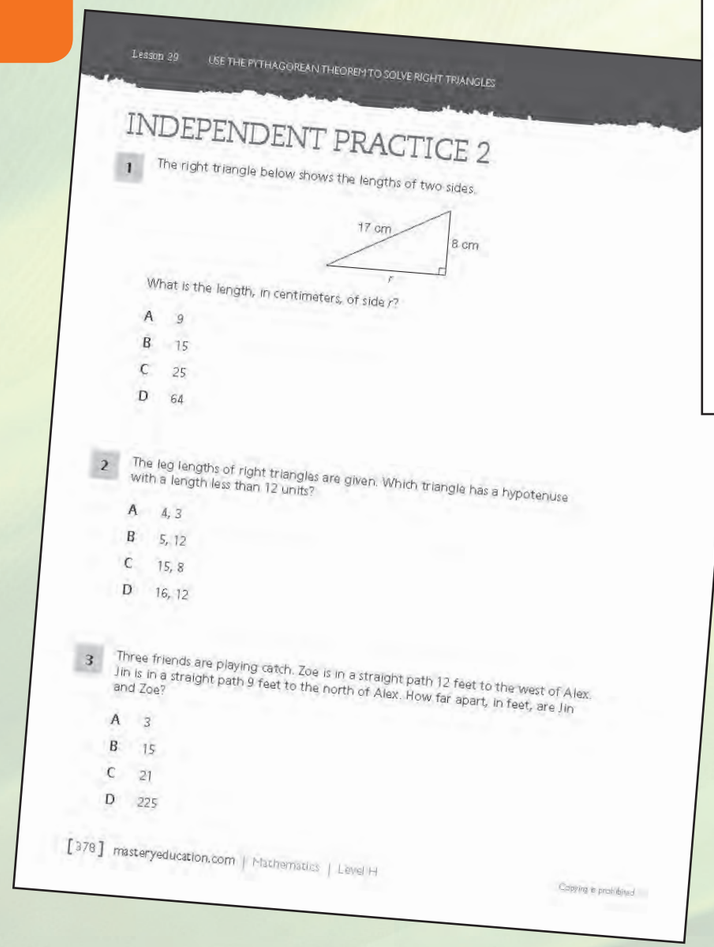
Mathematics

Grades 3-8

Independent Practice II

Includes questions at a mix of levels (mostly at DOK 2 and 3) and include no question supports. Items includes multiple choice and constructed response items.

Grade 8, Lesson 29



Lesson 29 USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES

INDEPENDENT PRACTICE 2

1 The right triangle below shows the lengths of two sides.

What is the length, in centimeters, of side *r*?

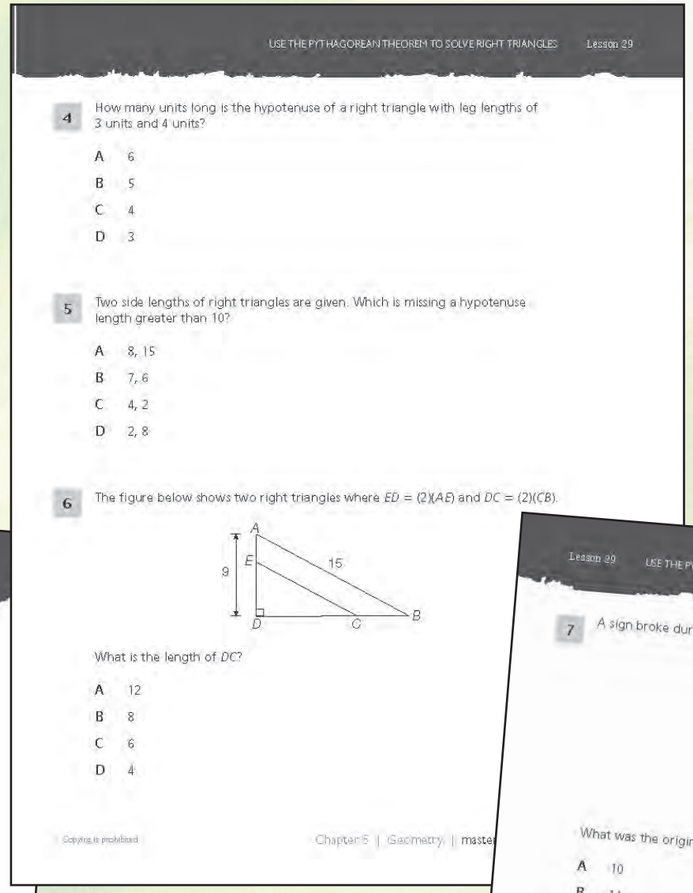
A 9
B 15
C 25
D 64

2 The leg lengths of right triangles are given. Which triangle has a hypotenuse with a length less than 12 units?

A 4, 3
B 5, 12
C 15, 8
D 16, 12

3 Three friends are playing catch. Zoe is in a straight path 12 feet to the west of Alex. Jin is in a straight path 9 feet to the north of Alex. How far apart, in feet, are Jin and Zoe?

A 3
B 15
C 21
D 225



USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES Lesson 29

4 How many units long is the hypotenuse of a right triangle with leg lengths of 3 units and 4 units?

A 6
B 5
C 4
D 3

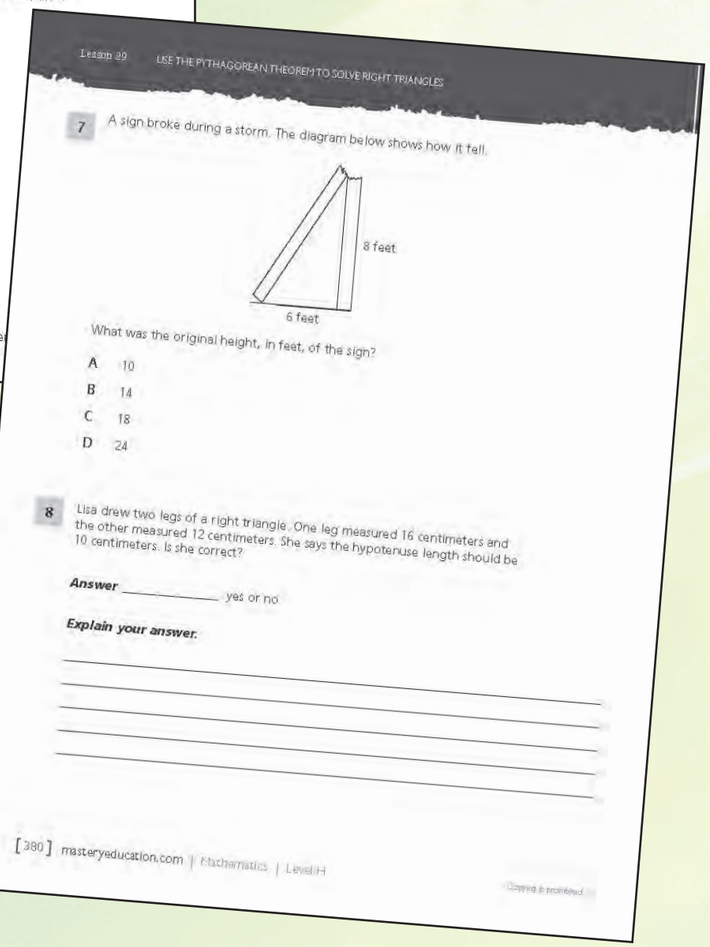
5 Two side lengths of right triangles are given. Which is missing a hypotenuse length greater than 10?

A 8, 15
B 7, 6
C 4, 2
D 2, 8

6 The figure below shows two right triangles where $ED = (2)(AE)$ and $DC = (2)(CB)$.

What is the length of *DC*?

A 12
B 8
C 6
D 4



Lesson 29 USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES

7 A sign broke during a storm. The diagram below shows how it fell.

What was the original height, in feet, of the sign?

A 10
B 14
C 18
D 24

8 Lisa drew two legs of a right triangle. One leg measured 16 centimeters and the other measured 12 centimeters. She says the hypotenuse length should be 10 centimeters. Is she correct?

Answer _____ yes or no

Explain your answer.

_____
_____
_____
_____
_____

Measuring Up

Mathematics

Grades 3-8

Independent Practice II

Includes questions at a mix of levels (mostly at DOK 2 and 3) and include no question supports. Items includes multiple choice and constructed response items.

INDEPENDENT PRACTICE 2

1 Yolanda used a place-value chart to write a number.

Thousands	Hundreds	Tens	Ones
3	5	1	2

Which is another way to write this number?

A 300 + 50 + 10 + 2

B 2,000 + 1,000 + 500 + 10 + 2

C 3,000 + 400 + 100 + 2

D 3,000 + 500 + 20 + 1

2 A coffee shop sold one thousand three cups of tea during May. What is this number in expanded form?

A 1,000 + 30

B 1,000 + 3

C 100 + 3

D 1,000 + 30 + 3

3 Which of the following means 4 thousands, 3 hundreds, and 2 ones?

A 432

B 4,032

C 4,302

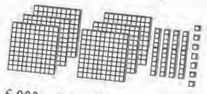
D 40,302

4 Which does not show the same as 6 thousands, 4 tens, and 7 ones?

A 6,047

B 4,000 + 2,000 + 40 + 7

C



D 6,000 + 30 + 10 + 7

5 Emma ran 5,000 feet. Jose ran 907 feet. Emma writes the total number of feet the two ran in a place-value chart. Which shows the number Emma writes?

A 5,000 + 90 + 7

B 5,000 + 900 + 7

C 5,000 + 900 + 70

D 9,000 + 500 + 7

6 Li-mei tried to write the number 4,802 in expanded form.

4,000 + 80 + 2

Which change would make Li-mei's answer correct?

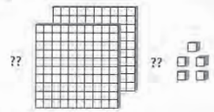
A Change 4,000 to 400.

B Change 80 to 8,000.

C Change 80 to 800.

D Change 2 to 20.

7 The model below shows how many people went to a concert. The thousands and tens are missing.



Which could be the number of people?

A 4,325

B 6,592

C 8,245

D 9,260

8 In science class, Ana puts 1,000 milliliters (mL) of water in a bottle. Next, she adds 200 mL of water. Then she adds 50 mL of water. How many milliliters of water will be in the bottle if she adds 100 more milliliters? Draw a model in the space provided.

Show your work.

Answer _____ milliliters

9 Marcelo and his friends collect pennies. Marcelo has four thousand pennies. Viriato has one thousand, nine hundred pennies. Sabina has six pennies. What is the total number of pennies the friends have? Use the place-value chart to help.

Thousands	Hundreds	Tens	Ones

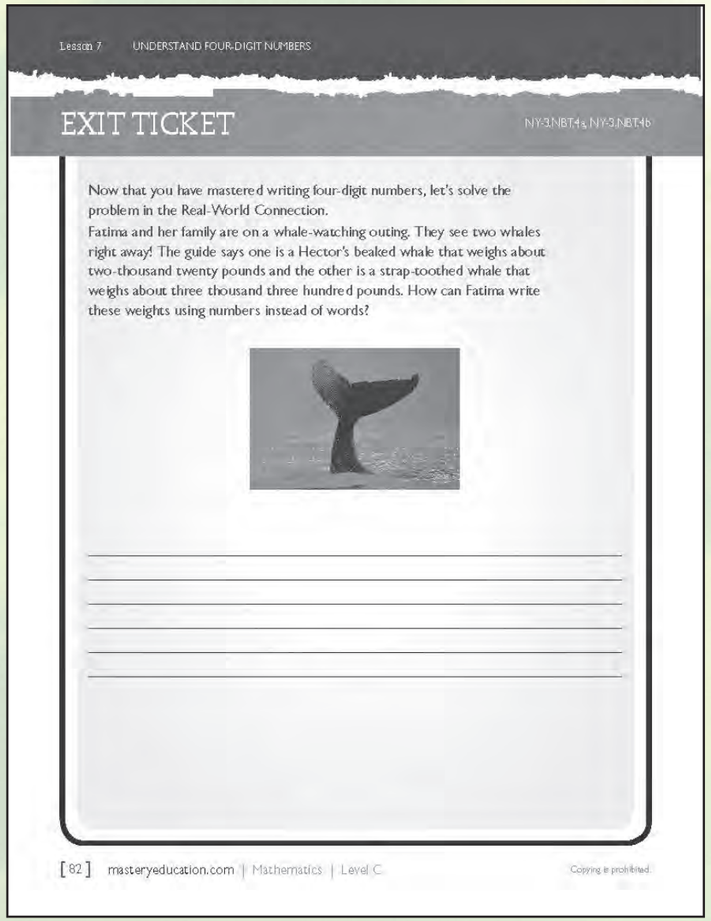
Explain how you found the answer.

Measuring Up®

Mathematics
Grades 3-8

Exit Ticket

Use this writing activity as a check for understanding asking students to apply skill to a real-world question.



Lesson 7 UNDERSTAND FOUR-DIGIT NUMBERS

EXIT TICKET NY-3.NBT.1, NY-3.NBT.2

Now that you have mastered writing four-digit numbers, let's solve the problem in the Real-World Connection.

Fatima and her family are on a whale-watching outing. They see two whales right away! The guide says one is a Hector's beaked whale that weighs about two-thousand twenty pounds and the other is a strap-toothed whale that weighs about three thousand three hundred pounds. How can Fatima write these weights using numbers instead of words?

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Grade 3, Lesson 7

Lesson 29 USE THE PYTHAGOREAN THEOREM TO SOLVE RIGHT TRIANGLES

EXIT TICKET NY-8.G.7

Now that you have mastered applying the Pythagorean theorem, let's solve the problem in the Real-World Connection.

Sayid rides his bike from school to a bookstore, and then from the bookstore to a computer shop. The bookstore is on a straight path 4 miles east of the school. The computer shop is on a straight path 3 miles north of the bookstore. Use the Pythagorean theorem to find the straight-path distance directly from school to the computer shop.

Pythagorean Theorem

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Grade 8, Lesson 29

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Mathematics

Grades 3-8

The 8 Mathematical Practices are incorporated into the lessons.

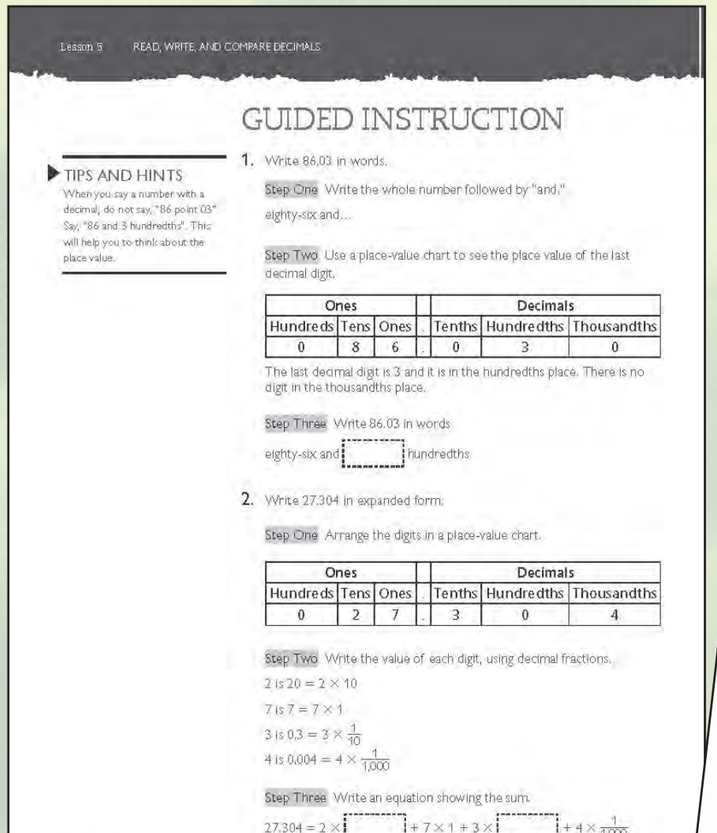
1

Make sense of problems and persevere in solving them.

Guided Instruction as well as the tips within the **Independent Practice I** provide students with examples and tools that allow them to understand how to begin solving a problem, how to progress through a problem, and how to monitor and evaluate their responses.

Students practice these solution techniques on their own in **Independent Practice II** and **Exit Ticket**.

Grade 5, Lesson 5



Lesson 5 READ, WRITE, AND COMPARE DECIMALS

GUIDED INSTRUCTION

TIPS AND HINTS

When you say a number with a decimal, do not say, "86 point 03". Say, "86 and 3 hundredths". This will help you to think about the place value.

1. Write 86.03 in words.

Step One Write the whole number followed by "and."

eighty-six and...

Step Two Use a place-value chart to see the place value of the last decimal digit.

Ones				Decimals		
Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
0	8	6	.	0	3	0

The last decimal digit is 3 and it is in the hundredths place. There is no digit in the thousandths place.

Step Three Write 86.03 in words.

eighty-six and [ ] hundredths

2. Write 27.304 in expanded form.

Step One Arrange the digits in a place-value chart.

Ones				Decimals		
Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
0	2	7	.	3	0	4

Step Two Write the value of each digit, using decimal fractions.

2 is 20 = 2×10

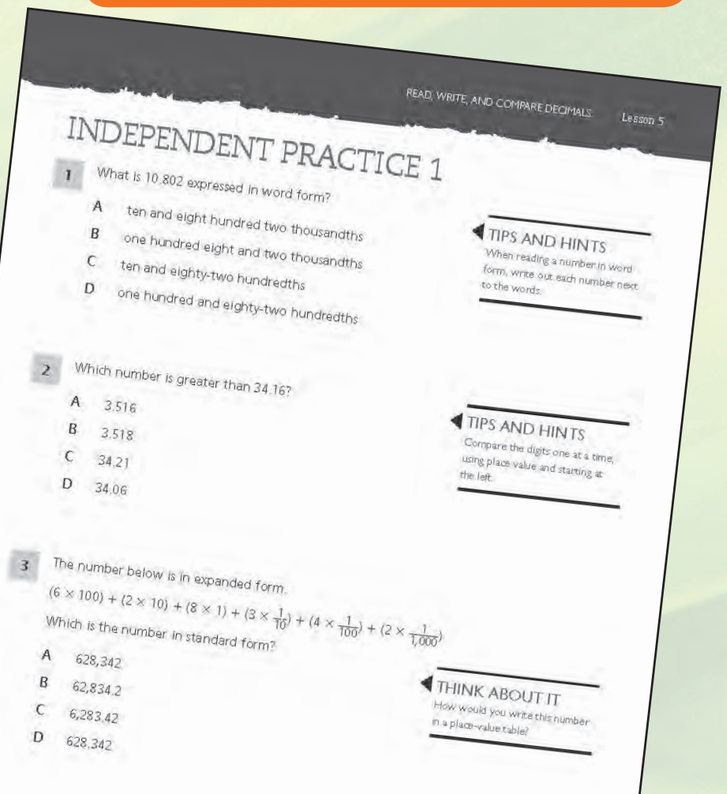
7 is 7 = 7×1

3 is 0.3 = $3 \times \frac{1}{10}$

4 is 0.004 = $4 \times \frac{1}{1,000}$

Step Three Write an equation showing the sum.

$27.304 = 2 \times$ [ ] $+ 7 \times 1 + 3 \times$ [ ] $+ 4 \times \frac{1}{1,000}$



READ, WRITE, AND COMPARE DECIMALS Lesson 5

INDEPENDENT PRACTICE 1

1 What is 10.802 expressed in word form?

A ten and eight hundred two thousandths
B one hundred eight and two thousandths
C ten and eighty-two hundredths
D one hundred and eighty-two hundredths

TIPS AND HINTS
When reading a number in word form, write out each number next to the words.

2 Which number is greater than 34.16?

A 3.516
B 3.518
C 34.21
D 34.06

TIPS AND HINTS
Compare the digits one at a time, using place value and starting at the left.

3 The number below is in expanded form.

$(6 \times 100) + (2 \times 10) + (8 \times 1) + (3 \times \frac{1}{10}) + (4 \times \frac{1}{100}) + (2 \times \frac{1}{1,000})$

Which is the number in standard form?

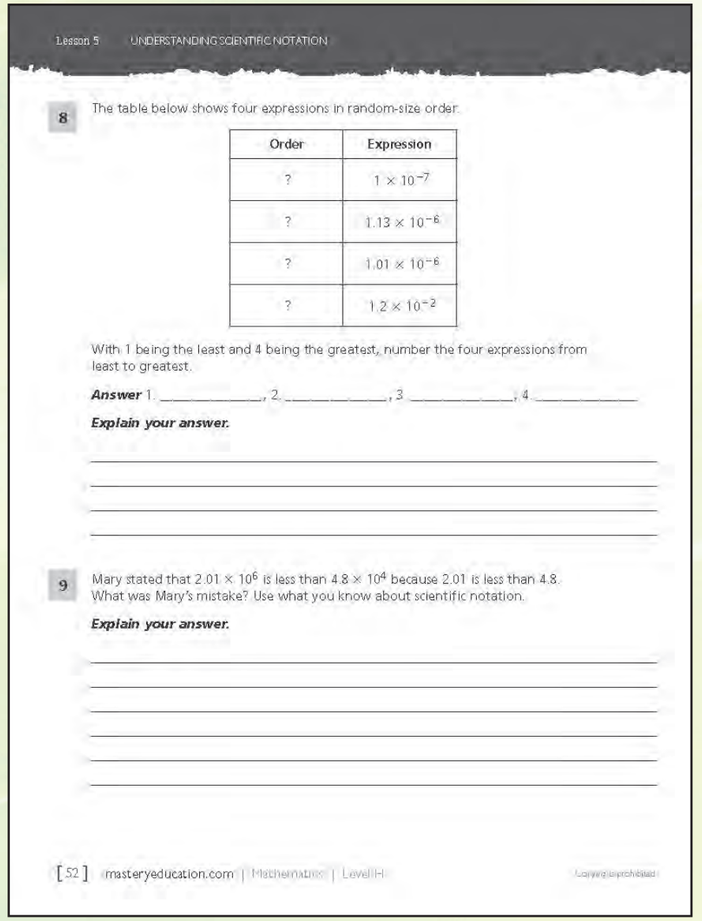
A 628,342
B 62,834.2
C 6,283.42
D 628.342

THINK ABOUT IT
How would you write this number in a place-value table?

2

Reason abstractly and quantitatively.

Within each lesson, there are 3 constructed response questions. Most of these require students to both provide quantitative answers and to explain the reasoning behind their answers.



Lesson 5 UNDERSTANDING SCIENTIFIC NOTATION

8 The table below shows four expressions in random-size order.

Order	Expression
?	1×10^{-7}
?	1.13×10^{-6}
?	1.01×10^{-6}
?	1.2×10^{-2}

With 1 being the least and 4 being the greatest, number the four expressions from least to greatest.

Answer 1. _____, 2. _____, 3. _____, 4. _____

Explain your answer.

9 Mary stated that 2.01×10^6 is less than 4.8×10^4 because 2.01 is less than 4.8. What was Mary's mistake? Use what you know about scientific notation.

Explain your answer.

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Grade 8, Lesson 5

Measuring Up

Mathematics

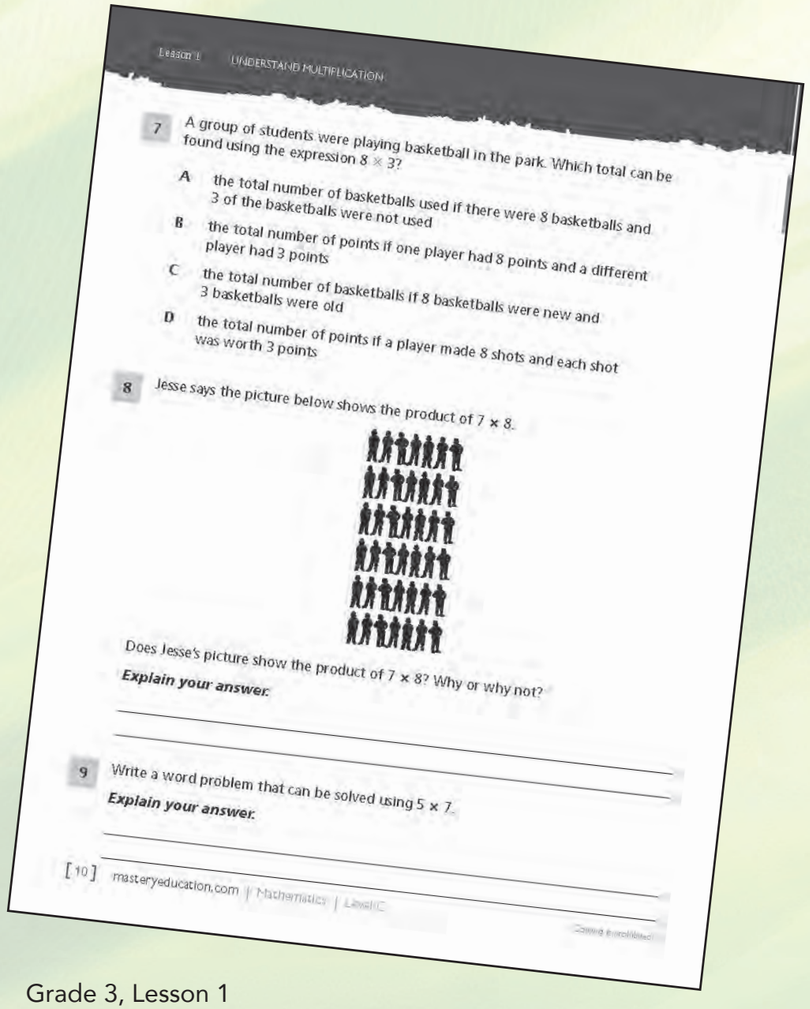
Grades 3-8

3

Construct viable arguments and critique the reasoning of others.

Many lessons include questions where students have to determine what, if any, error a person has made when solving a math problem.

Lessons include partner or group activities where students naturally critique and discuss each other's reasoning as they work together.


Lesson 1 UNDERSTAND MULTIPLICATION

7 A group of students were playing basketball in the park. Which total can be found using the expression 8×3?

A the total number of basketballs used if there were 8 basketballs and 3 of the basketballs were not used

B the total number of points if one player had 8 points and a different player had 3 points

C the total number of basketballs if 8 basketballs were new and 3 basketballs were old

D the total number of points if a player made 8 shots and each shot was worth 3 points

8 Jesse says the picture below shows the product of 7×8.

Does Jesse's picture show the product of 7×8? Why or why not?

Explain your answer.

9 Write a word problem that can be solved using 5×7.

Explain your answer.

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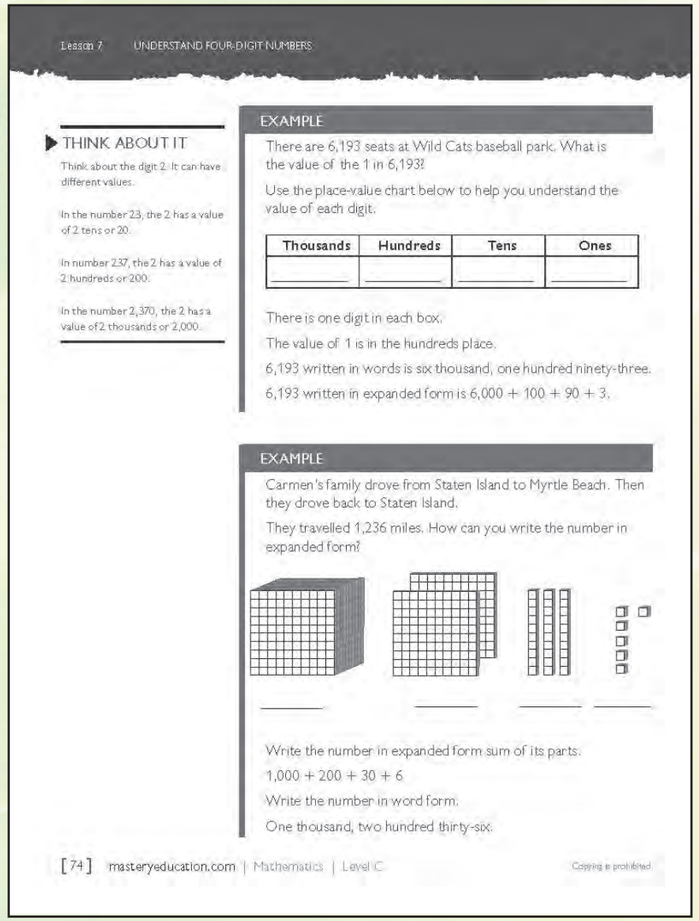
Grade 3, Lesson 1

4

Model with mathematics.

The lessons are full of visual models that will help students understand the mathematical concepts.


Lesson 7 UNDERSTAND FOUR-DIGIT NUMBERS

THINK ABOUT IT

Think about the digit 2. It can have different values.

In the number 23, the 2 has a value of 2 tens or 20.

In number 237, the 2 has a value of 2 hundreds or 200.

In the number 2,370, the 2 has a value of 2 thousands or 2,000.

EXAMPLE

There are 6,193 seats at Wild Cats baseball park. What is the value of the 1 in 6,193?

Use the place-value chart below to help you understand the value of each digit.

Thousands	Hundreds	Tens	Ones

There is one digit in each box.

The value of 1 is in the hundreds place.

6,193 written in words is six thousand, one hundred ninety-three.

6,193 written in expanded form is $6,000 + 100 + 90 + 3$.

EXAMPLE

Carmen's family drove from Staten Island to Myrtle Beach. Then they drove back to Staten Island.

They travelled 1,236 miles. How can you write the number in expanded form?

Write the number in expanded form sum of its parts.

$1,000 + 200 + 30 + 6$

Write the number in word form.

One thousand, two hundred thirty-six.

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Grade 3, Lesson 7

Measuring Up

Mathematics
Grades 3-8

5

Use appropriate tools strategically.

Where appropriate, the lessons incorporate mathematical tools that students can use to make the problems easier to understand and work. Examples include:

—the Properties of Operation

—math manipulatives

—sketches

—relating to real life

—working together

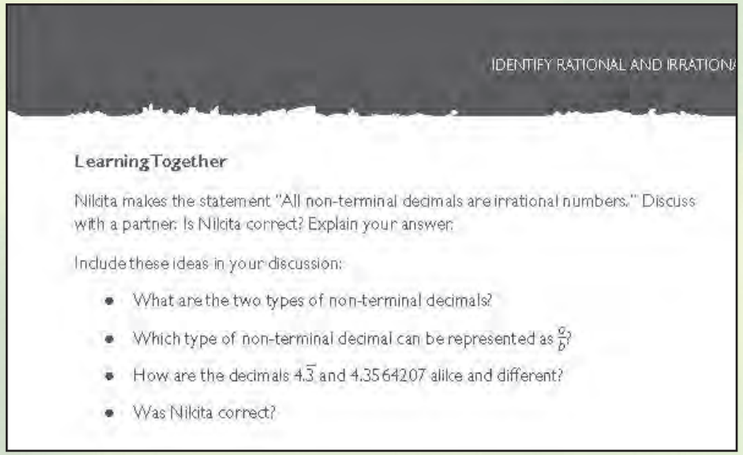
COMPARE AND ESTIMATE IRRATIONAL NUMBERS Lesson 2

EXIT TICKET

NY-8.NS.2

Now that you have mastered comparing and estimating irrational numbers, let's solve the problem in the Real-World Connection.

Luciano's company is building a wildlife sanctuary on a plot of land. The plot is square-shaped and has an area of 3 square miles. He must estimate the side lengths of the plot so he can purchase fencing. He will receive a discount on fencing if he buys more than 8 miles of fencing. To find the length of each side, he must estimate the value of $\sqrt{3}$. What is an estimate for the value of $\sqrt{3}$? Approximately how long is each side?



IDENTIFY RATIONAL AND IRRATIONA

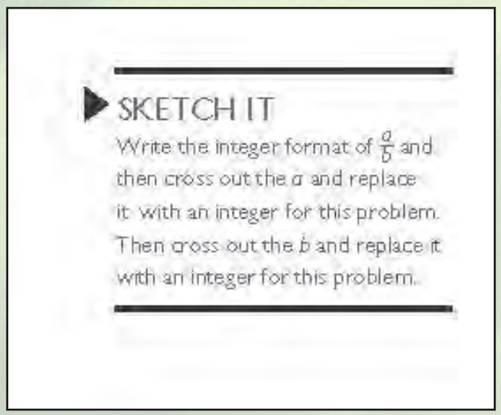
Learning Together

Nilda makes the statement "All non-terminal decimals are irrational numbers." Discuss with a partner. Is Nilda correct? Explain your answer.

Include these ideas in your discussion:

- What are the two types of non-terminal decimals?
- Which type of non-terminal decimal can be represented as $\frac{a}{b}$?
- How are the decimals $4.\overline{3}$ and 4.3564207 alike and different?
- Was Nilda correct?

Grade 8, Lesson 1



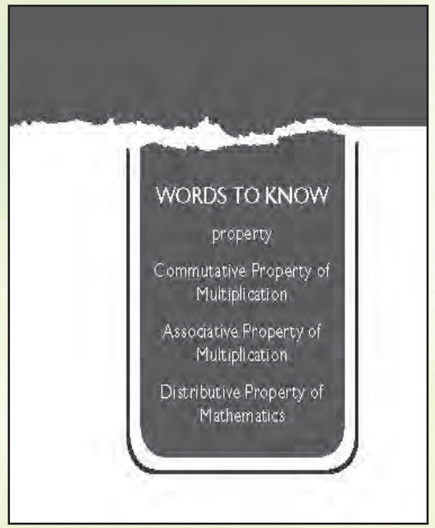
SKETCH IT

Write the integer format of $\frac{a}{b}$ and then cross out the a and replace it with an integer for this problem. Then cross out the b and replace it with an integer for this problem.

6

Attend to precision.

Every lesson provides content-related vocabulary and thorough explanations for using the vocabulary. Inclusion of this vocabulary content encourages students to incorporate the vocabulary into their mathematical thinking and discussing.



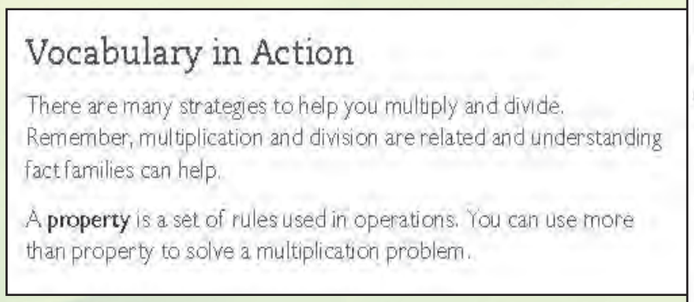
WORDS TO KNOW

property

Commutative Property of Multiplication

Associative Property of Multiplication

Distributive Property of Mathematics



Vocabulary in Action

There are many strategies to help you multiply and divide. Remember, multiplication and division are related and understanding fact families can help.

A **property** is a set of rules used in operations. You can use more than property to solve a multiplication problem.

Grade 3, Lesson 4

THINK ABOUT IT

As you learn your multiplication facts, think of ways you can use these properties to help you.

Measuring Up

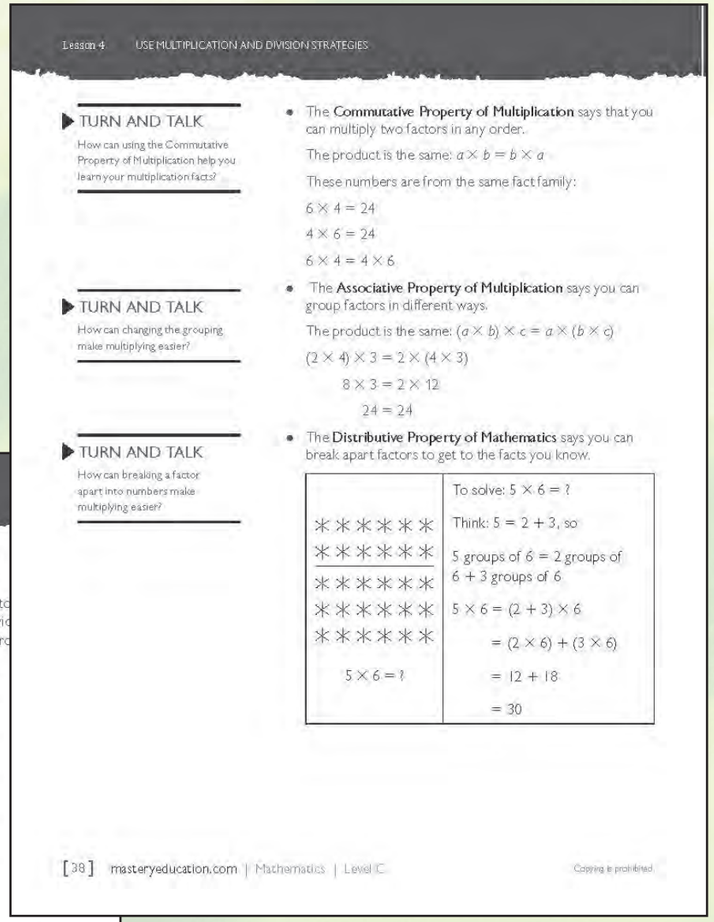
Mathematics

Grades 3-8

7

Look for and make use of structure.

The lessons provide extensive instruction in the use of the Properties of Operation as well as Order of Operations so that students are constantly focusing on and using these structures as well as reasoning about them.



Lesson 4 USE MULTIPLICATION AND DIVISION STRATEGIES

TURN AND TALK

How can using the Commutative Property of Multiplication help you learn your multiplication facts?

- The **Commutative Property of Multiplication** says that you can multiply two factors in any order.

The product is the same: $a \times b = b \times a$

These numbers are from the same fact family:

$6 \times 4 = 24$

$4 \times 6 = 24$

$6 \times 4 = 4 \times 6$

TURN AND TALK

How can changing the grouping make multiplying easier?

- The **Associative Property of Multiplication** says you can group factors in different ways.

The product is the same: $(a \times b) \times c = a \times (b \times c)$

$(2 \times 4) \times 3 = 2 \times (4 \times 3)$

$8 \times 3 = 2 \times 12$

$24 = 24$

TURN AND TALK

How can breaking a factor apart into numbers make multiplying easier?

- The **Distributive Property of Mathematics** says you can break apart factors to get to the facts you know.

$5 \times 6 = ?$

To solve: $5 \times 6 = ?$

Think: $5 = 2 + 3$, so

5 groups of 6 = 2 groups of 6 + 3 groups of 6

$5 \times 6 = (2 + 3) \times 6$

$= (2 \times 6) + (3 \times 6)$

$= 12 + 18$

$= 30$

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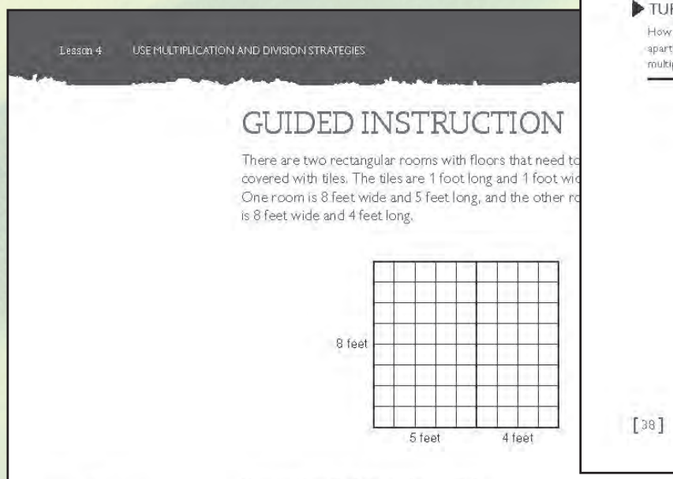

Lesson 4 USE MULTIPLICATION AND DIVISION STRATEGIES

GUIDED INSTRUCTION

There are two rectangular rooms with floors that need to covered with tiles. The tiles are 1 foot long and 1 foot wid One room is 8 feet wide and 5 feet long, and the other ro is 8 feet wide and 4 feet long.

How could you find the number of tiles?

1. **You could find 8 × 9, or you could use the Distributive Property and break the length of 9 feet into 5 feet and 4 feet.**

Step One Find the product of 8 and 5.

$8 \times 5 = 40$

Step Two Find the product of 8 and 4.

$8 \times 4 = 32$

Step Three Add the products

$40 + 32 = 72$

The floors will need 72 tiles.

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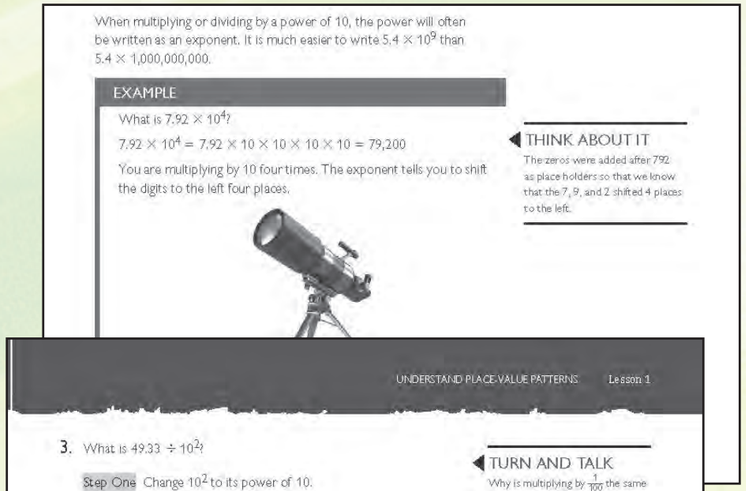
Grade 3, Lesson 4

8

Look for and express regularity in repeated reasoning.

The lessons provide ample Guided Instruction as well as ample Independent Practice to allow students to experience and recognize both patterns and shortcuts that they can use to simplify the math with which they are working.



When multiplying or dividing by a power of 10, the power will often be written as an exponent. It is much easier to write 5.4×10^9 than $5.4 \times 1{,}000{,}000{,}000$.

EXAMPLE

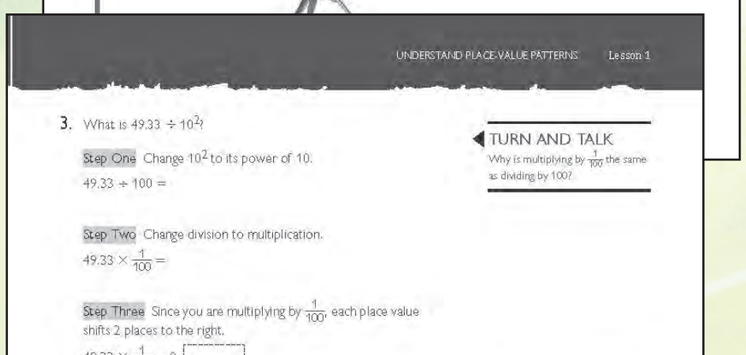
What is 7.92×10^4?

$7.92 \times 10^4 = 7.92 \times 10 \times 10 \times 10 \times 10 = 79{,}200$

You are multiplying by 10 four times. The exponent tells you to shift the digits to the left four places.

THINK ABOUT IT

The zeros were added after 792 as place holders so that we know that the 7, 9, and 2 shifted 4 places to the left.



UNDERSTAND PLACE-VALUE PATTERNS Lesson 1

3. What is $49.33 \div 10^2$?

TURN AND TALK

Why is multiplying by $\frac{1}{100}$ the same as dividing by 100?

Step One Change 10^2 to its power of 10.

$49.33 \div 100 =$

Step Two Change division to multiplication.

$49.33 \times \frac{1}{100} =$

Step Three Since you are multiplying by $\frac{1}{100}$, each place value shifts 2 places to the right.

$49.33 \times \frac{1}{100} = 0.$ ☐

TIPS AND HINTS

Will the decimal number be smaller or larger after it is multiplied? Will it be smaller or larger after it is divided?

4. Complete the equations.

Write each number in the appropriate box.

$0.21 \times 100 =$ ☐

$0.21 \div 10 =$ ☐

☐ $\times 100 = 210$

Grade 5, Lesson 1

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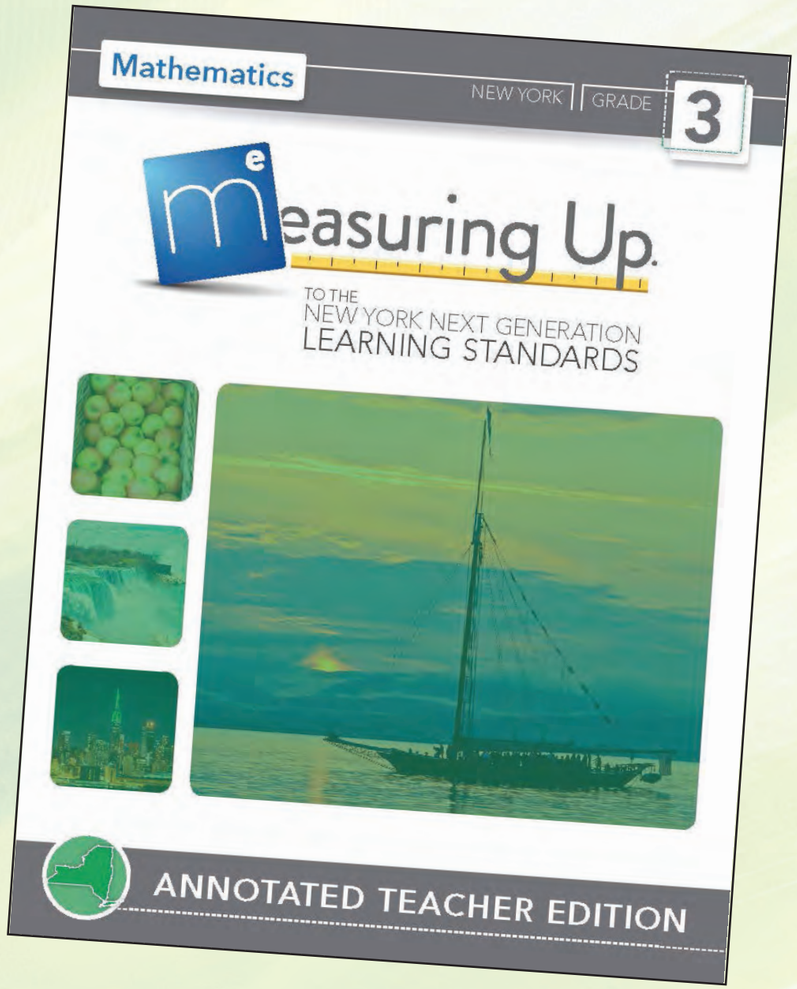

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