UNIT 4

Place Value Patterns and Decimal Operations

Essential Questions

- How are tenths, hundredths, and thousandths related?
- How can we use place value to add, subtract, multiply, and divide decimals to the hundredths?

Explore: Numbers Between Numbers
Students build curiosity from the beginning of the unit by engaging in a mathematical task that elicits multiple strategies and allows them to apply their own knowledge.

Unit Story: Market Day
In this story, 4 kid entrepreneurs showcase their clever businesses.

Focus on the TEKS

TEKS

Addressing

5.2.A, 5.2.B, 5.2.C, 5.3.A, 5.3.D, 5.3.E, 5.3.F, 5.3.G, 5.3.K

Math Process Standards:

5.1.A, 5.1.B, 5.1.C, 5.1.D, 5.1.E, 5.1.F, 5.1.G

ELPS:

1.A, 1.B, 1.C, 1.E, 1.F, 2.B, 2.C, 2.D, 2.E, 2.F, 3.A, 3.B, 3.C, 3.D, 3.E, 3.F, 3.G, 3.H, 4.A, 4.B, 4.D, 4.F

Students use the standard form, *expanded form,* and *expanded notation* to represent the value of digits in *decimals* to the *thousandths*. They use their understanding of decimal place value to compare and order decimals on number lines. They represent comparisons using the >, <, or = symbols. Students round decimals to the hundredths to a given place value, including in a mathematical context.

Students use the standard algorithm and place value understandings to add and subtract decimals to *hundredths*. They use objects and area models to represent and solve for *products* of decimals to the hundredths place. Students use hundredths grids, area models, and the standard algorithm to solve for *quotients* of decimals to the hundredths.

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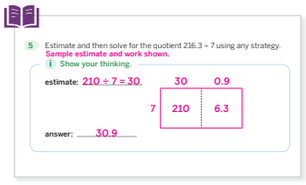
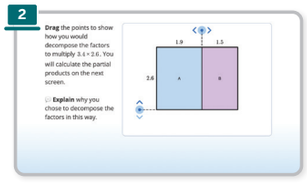
Connections and Coherence

Spotlight on Connecting the Content and Process Standards

Students engage in these Mathematical Process Standards as they . . .

TEKS 5.1.A	Apply their understanding of decimal place value to the hundredths place in order to rank finish times from fastest to slowest. **(Lesson 8, Activity 2)** **TEKS 5.2.B, 5.2.C**
TEKS 5.1.B	Analyze information in problems involving decimal division, select a strategy for solving, and justify the reasonableness of their solution. **(Lesson 16, Activity 1)** **TEKS 5.3.A, 5.3.G** 
TEKS 5.1.C	Select tools, such as base-ten blocks and hundredths models, to solve for products of whole numbers and decimals. **(Lesson 10, Activity 1)** **TEKS 5.3.D, 5.3.E**
TEKS 5.1.D	Use the Number Talk routine to communicate mathematical reasoning by explaining how to determine the quotient of different expressions using place value. **(Lesson 17, Warm Up)** **TEKS 5.3.G**
TEKS 5.1.E	Use area model representations to determine the product of two decimal factors. **(Lesson 13, Activity 1)** **TEKS 5.3.D, 5.3.E** 
TEKS 5.1.F	Analyze the relationship between digits and their value in decimals to the hundredths using the *standard form*, *expanded form*, and *expanded notation*. **(Lesson 4, Activities 1 and 2)** **TEKS 5.2.A**
TEKS 5.1.G	Use area models showing decimal multiplication and division to share ideas about the relationship between place values of factors in decimal multiplication problems. **(Lesson 13, Activity 1)** **TEKS 5.3.D, 5.3.E**

Coherence

Prior Learning

- Students compared and ordered whole numbers and decimals using concrete and visual models to the hundredths. **(Grade 4)** **TEKS 4.2.C, 4.2.F**
- Students added and subtracted whole numbers and decimals to the hundredths place using the standard algorithm **(Grade 4)** **TEKS 4.4.A**
- Students used place value strategies and the standard algorithm to multiply up to a four-digit number by a one-digit number, and a two-digit number by a two-digit number. **(Grade 4)** **TEKS 4.4.B, 4.4.D**
- Students used place value strategies and the standard algorithm to divide up to a four-digit dividend by a one-digit divisor and a two-digit number by a two-digit number. **(Grade 4)** **TEKS 4.4.E, 4.4.F**

Future Learning

- Students will locate, compare, and order integers and rational numbers using a number line. **(Grade 6)** **TEKS 6.2.C**
- Students will order a set of rational numbers arising from mathematical and real-world contexts. **(Grade 6)** **TEKS 6.2.D**
- Students will add, subtract, multiply, and divide integers fluently. **(Grade 6)** **TEKS 6.3.D**
- Students will multiply and divide positive rational numbers fluently. **(Grade 6)** **TEKS 6.3.E**

See the Connections to Future Learning page for more information, including explanations and examples.

Unit at a Glance

Explore

Numbers Between Numbers: Launch the unit with a nonroutine task to investigate the question, "Is there always a number between 2 numbers?"

Assess and Respond — Sub-Unit 1

A Pre-Unit Check

Learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

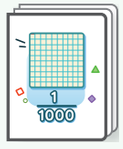
TEKS 4.2.B, 4.2.F

1 Explore: Numbers Between Numbers

Is there *always* a number between 2 numbers?

Identify numbers between 2 whole numbers, including decimal values.

TEKS Building Toward: 5.2.A
TEKS 5.1.A, 5.1.B, 5.1.F, 5.1.G



2 What Is Smaller Than One Hundredth?

Making Sense of Thousandths

Represent numbers to the thousandths.

TEKS Building Toward: 5.2.A
TEKS 5.1.D

3 Different Decimal Representations

Expanded Thousandths

Write and interpret decimals to the thousandths in word form, standard form, expanded form, or expanded notation.

TEKS Building Toward: 5.2.A
TEKS 5.1.D, 5.1.E, 5.1.F, 5.1.G

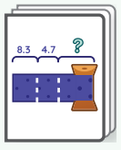
Assess and Respond — Sub-Unit 2

8 Rounding Races

Rounding Decimals to the Hundredths in Context

Round decimals to the nearest whole, tenth, and hundredth in context.

TEKS 5.2.B, 5.2.C
TEKS 5.1.A, 5.1.C, 5.1.F, 5.1.G



9 Market Day Preparation

Adding and Subtracting Decimals in Real-World Problems

Use place value strategies and algorithms to add and subtract decimals to the hundredths.

TEKS 5.3.K
TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.F, 5.1.G

A Quiz: Sub-Unit 1

Learn about your students' understanding of the concepts and skills so far in this unit.

TEKS 5.2.A, 5.2.B, 5.2.C, 5.3.K

10 Exploring Decimal Multiplication

Making Sense of Decimal Multiplication

Multiply whole numbers and decimals less than 1 to the hundredths using any representation or strategy.

TEKS 5.3.D, 5.3.E
TEKS 5.1.C, 5.1.D, 5.1.E

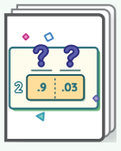
Sub-Unit 3

14 Breaking it Down!

Representing Decimal Division with Hundredths Models

Use objects to represent and solve problems involving division of decimals by whole numbers.

TEKS 5.3.F
TEKS 5.1.A, 5.1.E, 5.1.F, 5.1.G



15 Multiple Ways

Representing Division of Decimals with Area Models

Use area models to represent and solve for quotients of decimals to the hundredths.

TEKS 5.3.F
TEKS 5.1.A, 5.1.E, 5.1.F

16 Use What You Know

Using Whole Number Division to Divide Decimals

Relate whole number division to decimal division to determine decimal quotients.

TEKS 5.3.A, 5.3.G
TEKS 5.1.B, 5.1.C, 5.1.F, 5.1.G

17 Dividing Decimals the Standard Way

Dividing Decimals Using the Standard Algorithm

Use the standard algorithm to determine decimal quotients.

TEKS 5.3.A, 5.3.G
TEKS 5.1.C, 5.1.D, 5.1.E, 5.1.G

All lessons can be taught using the Student Edition while the teacher projects Presentation Screens.

We recommend students use devices to interact with some lessons, as indicated with .

Pacing: 21 days | **Short on time?** See pacing considerations below.

Pre-Unit Check: 20 min

17 Lessons: 60 min each

Sub-Unit Quizzes: 20 min each

End-of-Unit Assessment: 45 min

4 Notation and Numerals

Representing Decimals in Expanded Form and Expanded Notation, and with Numerals

Represent decimals to the thousandths in standard form, expanded form, or expanded notation.

TEKS 5.2.A
TEKS 5.1.E, 5.1.F, 5.1.G

5 The Claw

Locating Decimals on Number Lines

Locate decimals to the thousandths on number lines.

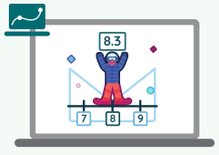
TEKS Building Toward 5.2.B
TEKS 5.1.E, 5.1.F

6 Selling Collectibles

Comparing Decimals to the Thousandths

Compare decimals to the thousandths.

TEKS 5.2.B
TEKS 5.1.D, 5.1.F, 5.1.G



7 Which Way Down the Mountain?

Rounding Decimals to the Hundredths

Round decimals to the nearest whole, tenth, and hundredth.

TEKS 5.2.C
TEKS 5.1.C, 5.1.D, 5.1.F

11 Comic Book Advertisements

Multiplying Whole Numbers and Decimals Less Than or Greater Than 1

Solve story problems involving multiplying a whole number and a decimal.

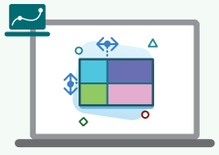
TEKS 5.3.D, 5.3.E
TEKS 5.1.C, 5.1.D, 5.1.E

12 Model Multiplication

Representing Multiplication of Decimals with Pictorial Models

Use hundredths models to represent the product of whole numbers and decimals, and decimals and decimals.

TEKS 5.3.D, 5.3.E
TEKS 5.1.A, 5.1.B, 5.1.E, 5.1.F, 5.1.G



13 Decimals, Models, and Decompositions

Representing Multiplication of Decimals With Area Models

Determine the product of 2 decimals using place value reasoning.

TEKS 5.3.D, 5.3.E
TEKS 5.1.E, 5.1.F, 5.1.G

Assess and Respond

A Quiz: Sub-Unit 2

Learn about your students' understanding of the concepts and skills so far in this unit.

TEKS 5.3.D, 5.3.E

Assess and Respond

A End-of-Unit Assessment

Learn about your students' understanding of the concepts and skills in the unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS 5.2.A, 5.2.B, 5.3.A, 5.3.D, 5.3.E, 5.3.G, 5.3.K
TEKS 5.1.A, 5.1.B, 5.1.C, 5.1.E, 5.1.F, 5.1.G

Pacing Considerations

End-of-Unit Assessment: This assessment can be given on the same day as the Pre-Unit Check for the next unit.

Lesson 1: This lesson can be omitted. It is an exploration that helps students engage in the unit, but is not essential for meeting required standards. If omitted, read and discuss the Unit Story prior to Lesson 2.

Lesson(s) 7–8: These lessons can be condensed into one lesson if students are able to round decimals to the nearest whole, tenth, and hundredth.

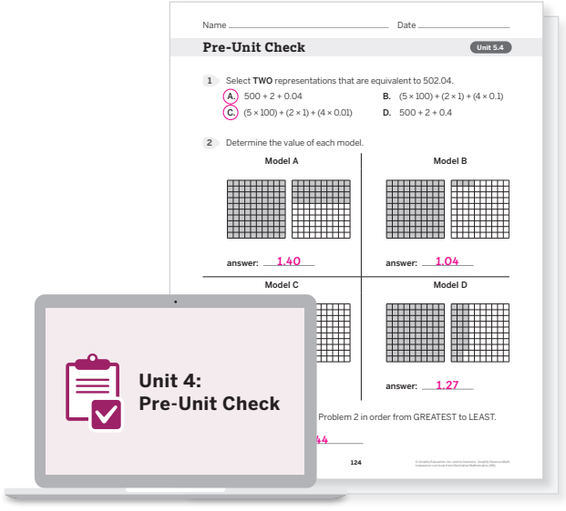
Assessments

Every unit includes a variety of formative and summative assessments designed to highlight students' understanding of a variety of concepts and skills.

Pre-Unit Check

Assign the **Pre-Unit Check** to learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

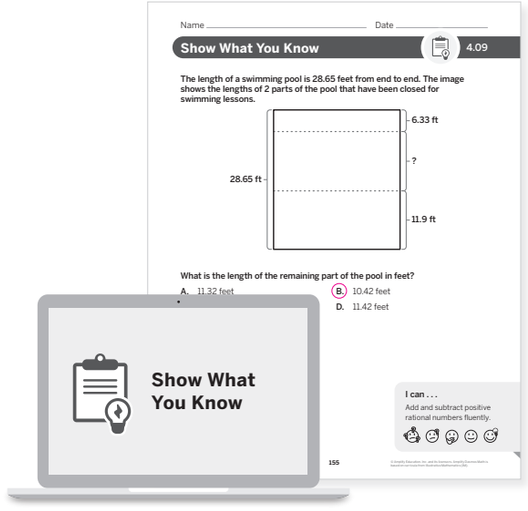
TEKS: 4.2.B, 4.2.F



Lesson | Show What You Know

Use the **Show What You Know** for each lesson to learn more about your students' progress toward the lesson goal(s). Here is one example from this unit.

TEKS: 5.1.A, 5.1.B, 5.3.K

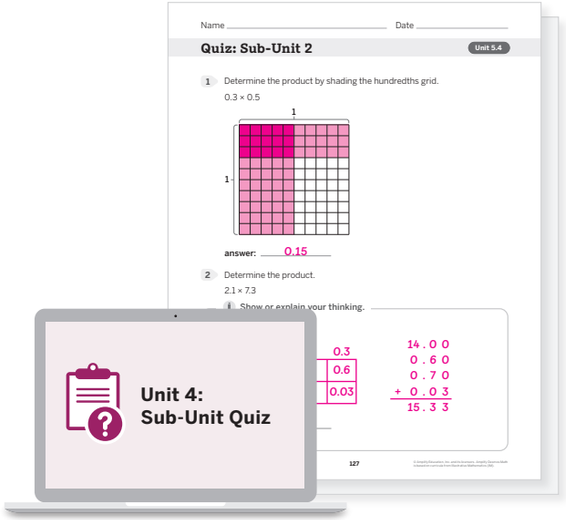


Sub-Unit Quizzes

Assign each **Sub-Unit Quiz** to learn about your students' understanding of the concepts and skills so far in this unit.

TEKS assessed on:

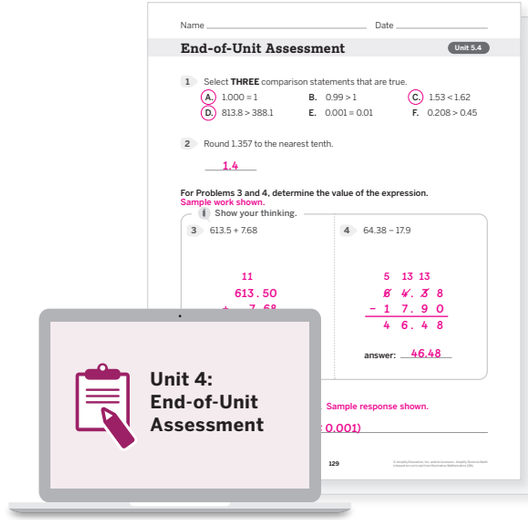
- **Sub-Unit Quiz 1:** 5.2.A, 5.2.B, 5.2.C, 5.3.K
- **Sub-Unit Quiz 2:** 5.3.D, 5.3.E



End-of-Unit Assessment

Assign the **End-of-Unit Assessment** to learn about your students' understanding of the concepts and skills in this unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS: 5.1.A, 5.1.B, 5.1.C, 5.1.E, 5.1.F, 5.1.G



Differentiation

Every unit includes additional resources to support, strengthen, and stretch student learning. You can also assign digital resources that adjust to each student's current level of skill and understanding:

• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

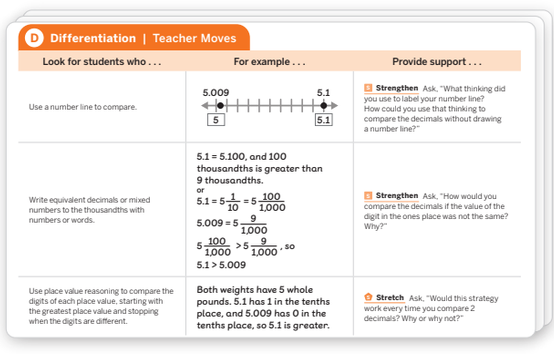
Differentiation Across the Unit

	Support Mini-Lessons	Strengthen Centers	Stretch Extensions
Sub-Unit 1 (Lessons 1–9)	• **ML 4.02:** Representing Decimals • **ML 4.03:** Writing Decimals in Expanded Notation • **ML 4.04:** Writing Decimals in Expanded Form and Expanded Notation • **ML 4.05:** Locating Decimals on Number Lines • **ML 4.06:** Comparing Decimals to the Thousandths • **ML 4.07:** Rounding Decimals • **ML 4.08:** Rounding Times Given in Seconds • **ML 4.09:** Solving Real-World Problems Involving Adding and Subtracting Decimals	• ***Get Your Numbers in Order:*** *Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100, Decimals* • ***Greatest of Them All:*** *Decimals to Hundredths, Decimals* • ***Mystery Number:*** *Six-digit numbers, Decimals, Rounding Decimals*	• **Sub-Unit 1 Extension Activities**
Sub-Unit 2 (Lessons 10–13)	• **ML 4.10:** Connecting Whole Number and Decimal Multiplication • **ML 4.11:** Multiplying Decimals by Whole Numbers • **ML 4.12:** Multiplying Decimals Less Than 1 • **ML 4.13:** Multiplying Two Decimals	• ***How Close?:*** *Multiply to 100, Multiply to 3,000, Multiply Fractions and Whole Numbers to 5, Adding Fractions to 5, Subtract Fractions From 5* • ***Target Numbers:*** *Add Tenths or Hundredths, Subtract Tenths or Hundredths*	• **Sub-Unit 2 Extension Activities**
Sub-Unit 3 (Lessons 14–17)	• **ML 4.14:** Representing Decimal Division With Hundredths Models • **ML 4.15:** Representing Division of Decimals With Area Models • **ML 4.16:** Using Whole Number Division to Divide Decimals • **ML 4.17:** Dividing Decimals Using the Standard Algorithm	• ***Match It:*** *Division Representations, Multiplication and Division Problems*	• **Sub-Unit 3 Extension Activities**

Differentiation Within the Lesson

Each Teacher Edition includes point-of-use differentiation suggestions to modify or adjust instruction during the lesson to accommodate the needs of all learners.

Here is one example from **Lesson 6**, where students are provided with a number line that has the first and last tick marks labeled to support them with comparing two decimals.



Vocabulary of the Unit

Every lesson includes opportunities for all students to access mathematical and non-mathematical vocabulary and actively participate in their own vocabulary development.

Vocabulary

New Vocabulary	Lesson
inequality	6
thousandths	2

Review Vocabulary

algorithm
decimal
decompose
difference
Distributive Property
estimate
expanded form
expanded notation
factor
fraction
hundredths
perimeter
product
quotient
rounding
sum
tenths

Contextual Vocabulary	Lesson
overlap	12
table	2
tie	8

Spotlight on Vocabulary

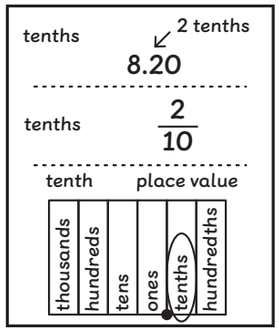
Vocabulary Strategy

In this unit, the term *tenths* is defined as part of ten equal parts. Students should be familiar with the first part of the term, *ten*. As a term, ten refers to a group of ten ones. Consider using the following vocabulary routine to support students' vocabulary development.

Word Connections: Words With Multiple Meanings

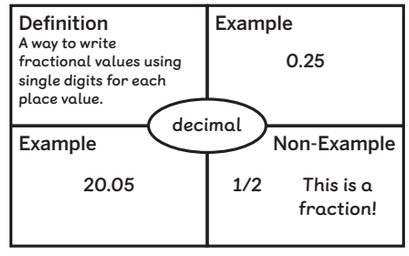
- Invite students to fold a piece of paper into three equal horizontal sections. In the top third, ask them to write the term *tenths* and draw a picture of its meaning.
- Invite them to repeat this in the middle and bottom thirds of the paper, each using a different definition or context for the term tenths.
- Consider inviting students to review this vocabulary as they start Lesson 2 to see what they remember.

ELPS 1.B, 1.D, 2.B, 3.D



Frayer Models

Lesson 1 Invite students to create a Frayer Model graphic organizer that shows the definition, example, and non-examples of the term *decimal*.



Additional Vocabulary Strategies and Frayer Model templates can be found in the ***Math Language Development Resources.***

Language Development

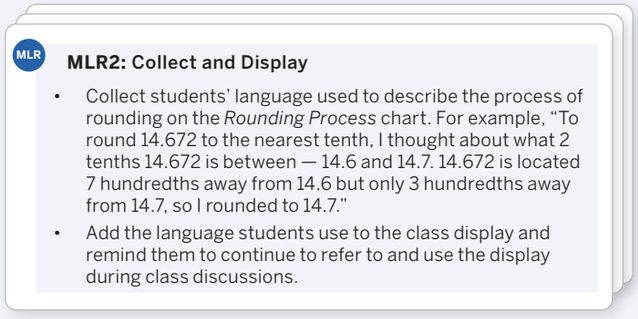
Every lesson includes embedded opportunities for all students, including those building English proficiency, to develop their mathematical language skills and engage in meaningful language interactions.

Math Language Routines

Math Language Routine	Lesson
MLR1: Stronger and Clearer Each Time	13, 16
MLR2: Collect and Display	1, 7
MLR3: Critique, Correct, Clarify	6, 12, 14
MLR6: Three Reads	9, 14
MLR7: Compare and Connect	2, 4, 10–11, 15
MLR8: Discussion Supports	3, 5, 8, 17

Spotlight on MLR2: Collect and Display

In **Lesson 7, Activity 1,** students describe the mathematical process of rounding. **ELPS 3.C, 3.D, 3.E, 3.F**



Spotlight on Meaningful Language Interactions

Listening

In the **Explore** lesson, students explore the density of numbers as they identify numbers between 2 whole numbers.

EB **Emergent Bilinguals** Students may be unfamiliar with the term *between*. Consider demonstrating this concept using student volunteers, asking a student to stand between two others while you say the term aloud. **ELPS 1.B**

Speaking

In **Lesson 16, Activity 1,** students share how they used whole number division to help them determine the quotient of a decimal division problem.

EB **Emergent Bilinguals** Invite students to restate the question in their own words and to ask any clarifying questions. Then invite them to rehearse their responses with a partner before sharing with the class. **ELPS 1.E, 2.D, 2.F**

Reading

In **Lesson 4, Activity 1,** students develop their understanding of decimal place value relationships.

EB **Emergent Bilinguals** Create a classroom display that shows a visual of each representation and the representation name. Encourage students to use the chart to support them in understanding the meaning of the terms while you say the term aloud. **ELPS 3.D, 3.F**

Writing

In **Lesson 17, Activity 1,** students share conjectures about the placement of decimal points when dividing with the standard algorithm.

EB **Emergent Bilinguals** Encourage students to record what they discussed with a partner about decimal point placement when solving using the standard algorithm using drawings, words, or a graphic organizer. **ELPS 4.C**

Materials and Prep

Here are materials and resources used in this unit and where to find them.

Materials

Manipulative Kit

- number cards **(Lesson 6)**
- base-ten blocks **(Lessons 1, 10–11, 14–15)**

Hands-on

Classroom materials

- tools to create a visual display **(Lesson 2)**
- chart paper, markers **(Lesson 7)**
- colored pencils **(Lesson 12)**
- graph paper **(Lesson 17)**

Additional Printable Resources

Lesson

- Activity PDFs* **(Lessons 1–4, 7–8, 10–11, 16)**

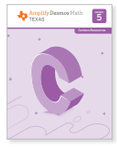
  *Refer to each lesson overview to see the Activity PDFs needed for the lesson.
- Work Mats, Cards, and Grids

PDF
Presentation Screens
Digital

Centers

- Center PDFs*

  *Refer to the Centers page to see the Center PDFs needed or suggested for the unit.
- Work Mats, Cards, and Grids



PDF

Assessment

- Pre-Unit Check
- Quiz: Sub-Unit 1
- Quiz: Sub-Unit 2
- Quiz: Sub-Unit 3
- End-of-Unit Assessment, Forms A and B
- End-of-Unit Assessment Rubrics
- Show What You Knows

PDF
Digital

Intervention and Extension Resources

- Mini-Lessons
- Extensions

PDF
Digital

Caregiver Support

These resources can be shared with students' caregivers. They provide background on the mathematics in this unit, as well as suggestions for supporting students at home.

Caregiver Hub

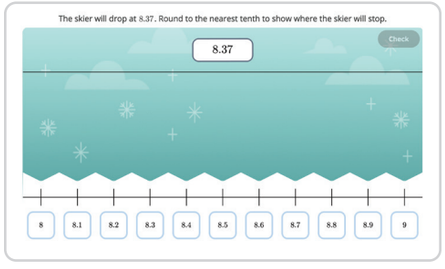
Caregiver Letter

Centers

Technology

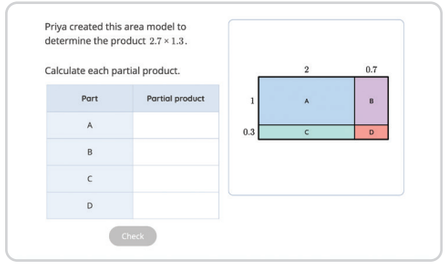
Dynamic, digital interactions are integral to Amplify Desmos Math. Powerful digital tools, such as the teacher dashboard, enable teachers to effectively facilitate rich math discussions.

A Powerful Digital Experience



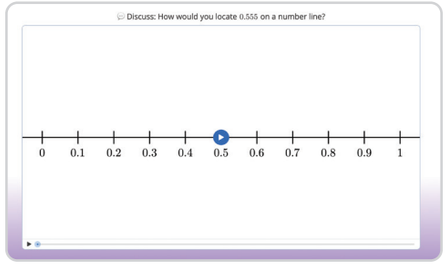
Visualize the Mathematics
(Lesson 7)

Students use multiple representations of mathematical concepts and skills in order to make connections, understand structure, and find patterns.



Receive Responsive Feedback
(Lesson 13)

Students are free to explore mathematics in interactive ways. When they try new ideas, they receive real-time responsive feedback so they can refine their thinking and move learning forward.



Collaborate With Classmates
(Lesson 5)

Students have opportunities to view, appreciate, and respond to the mathematical thinking of their classmates and work together in problem solving.

Lessons With Digital Student Screens

Digital Lessons are recommended to be taught with students on devices for a dynamic learning experience. Aligned Student Edition pages are also available for notetaking and off-device learning when needed.

Lesson	Why digital?
5 The Claw	Students locate and label decimals to the thousandths on number lines and receive responsive feedback in real time.
7 Which Way Down the Mountain?	Students round decimals to any place with or without using number lines and receive responsive feedback in real time.

Lesson	Why digital?
13 Decimals, Models, and Decompositions	Students use area diagrams to determine products of 2 decimals and receive responsive feedback in real time.

Accessibility

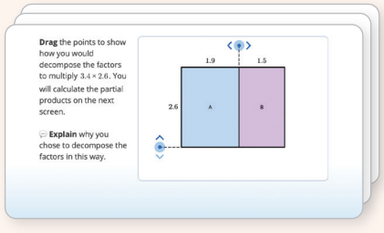
Every lesson is designed using the principles of Universal Design for Learning. Every lesson also includes support suggestions that build on students' strengths.

Universal Design for Learning

Here is one example from a lesson designed to support Engagement.

Spotlight on Engagement . . .

Lesson 13, Activity 1: Students are invited to show how they would decompose two decimal factors on an area model.

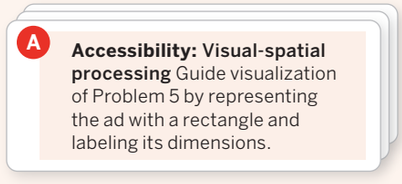


Just-In-Time Accommodations and Supports

Each Teacher Edition includes suggested supports that are based on the areas of cognitive function recognized by the Education Development Center (EDC).

Spotlight on Fine Motor Skills . . .

Lesson 11, Activity 2: This Accessibility support helps students as they represent multi-step story problems with equations.



Centers

Every unit includes Centers, which are fun and engaging ways for students to practice math skills. This table shows the Center stages introduced during Lessons as an Activity, used in Center Choice Time, and suggested for Beyond the Lesson or Assess and Respond Differentiation. More information can be found in the Center Resources book.

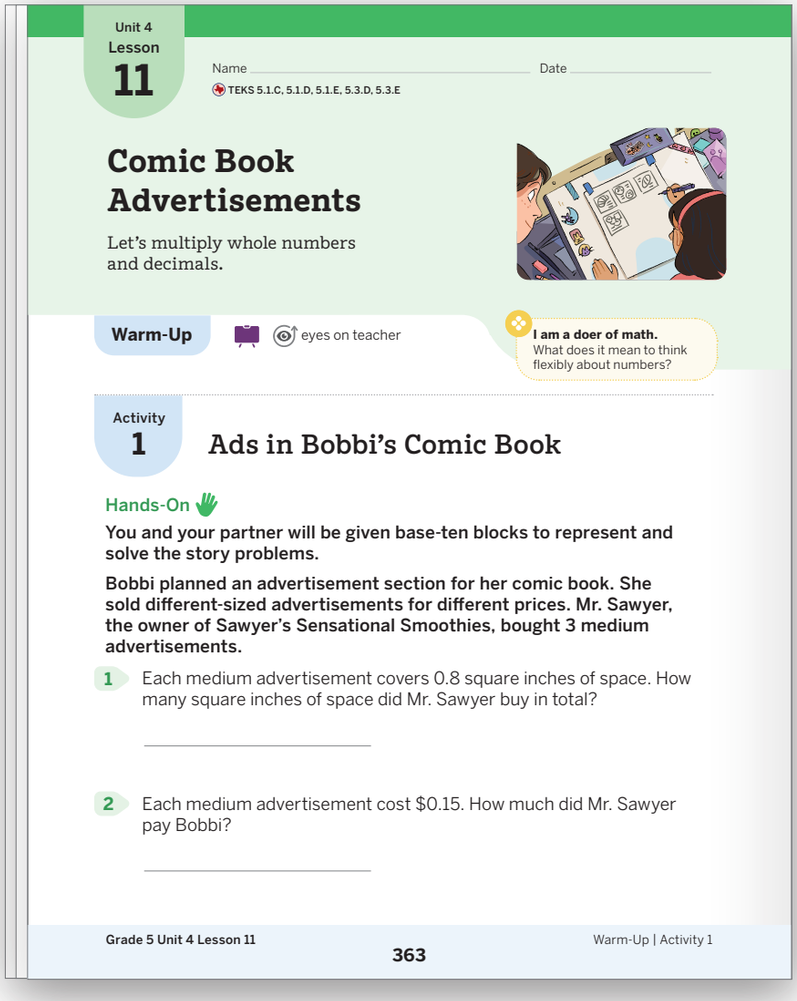
		Introduced in Activity in	Suggested for Differentiation in	TEKS
Get Your Numbers in Order	Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100	Grade 4	Lessons 2–5	4.3.D
	Decimals	Grade 4	Lessons 6–8	4.3.D
Greatest of Them All	Decimals to Hundredths	Grade 4	Lessons 2–6	4.2.C
	Decimals	Grade 4	Lessons 7–8	BO 4.2.F
Mystery Number	Six-digit Numbers	Grade 4	Lesson 2	BT 4.2.A
	Decimals	Grade 5	Lessons 3–8	BT 5.2.A
	Rounding Decimals	Grade 5	Lessons 7–8	5.2.C
How Close?	Multiply to 100	Grade 3	Lessons 11–12	3.4.F, 3.4.G
	Multiply to 3,000	Grade 4	Lesson 10	4.4.D
	Multiply Fractions and Whole Numbers to 5	Grade 5	Lessons 10–11, 13	BO 5.3.1
	Adding Fractions to 5	Grade 5	Lesson 9	5.3.H
	Subtract Fractions From 5	Grade 5	Lesson 9	5.3.H
Match It	Division Representations	Grade 3	Lessons 14–17	3.5.B
	Multiplication and Division Problems	Grade 3	Lessons 14–17	3.5.B
Target Numbers	Add Tenths or Hundredths	Grade 5	Lesson 9	5.3.K
	Subtract Tenths or Hundredths	Grade 5	Lesson 9	5.3.K

Professional Learning

Here is an opportunity to deepen your understanding of the math in this unit and how to teach it.

Spotlight on Reasoning

Lesson 11, Activity 1



Unit 4
Lesson
11

Name _____ Date _____

TEKS 5.1.C, 5.1.D, 5.1.E, 5.3.D, 5.3.E

Comic Book Advertisements

Let's multiply whole numbers and decimals.

Warm-Up eyes on teacher

I am a doer of math.
What does it mean to think flexibly about numbers?

Activity
1

Ads in Bobbi's Comic Book

Hands-On

You and your partner will be given base-ten blocks to represent and solve the story problems.

Bobbi planned an advertisement section for her comic book. She sold different-sized advertisements for different prices. Mr. Sawyer, the owner of Sawyer's Sensational Smoothies, bought 3 medium advertisements.

1 Each medium advertisement covers 0.8 square inches of space. How many square inches of space did Mr. Sawyer buy in total?

_____

2 Each medium advertisement cost $0.15. How much did Mr. Sawyer pay Bobbi?

_____

Grade 5 Unit 4 Lesson 11 363 Warm-Up | Activity 1

Try This

Put on your student hat and complete Problems 1, 2, and 5.

Questions for reflection

- Students are asked to multiply whole numbers and decimals to solve story problems.
  - » What do students need to understand to predict the size of the answer? To evaluate?
- Some students may use a strategy where they relate to whole number multiplication.
  - » How might you support your students in making sense of the product?

Other lessons that attend to reasoning:

- **Lesson 13:** Students use place value reasoning to determine whether the product of 2 decimals is reasonable and to justify the placement of the decimal point.
- **Lesson 22:** Students reason about sizes of quotients by estimating the quotients of decimals and whole numbers They use mental math and number sense strategies by using their understanding of whole number division to reason about the size of quotients.

Mathematical Background

Here is an overview of the content your students will learn in this unit.

Place Value Patterns and Decimal Operations

Represent the value of digits in decimals to thousandths.

TEKS 5.2.A

- Decimals can be represented in *standard form, expanded form,* and *expanded notation.*
  - » *Expanded form* and *expanded notation* decompose decimals to represent the value of each digit.

Represent fifty-two and thirty-seven thousandths in the table.

Standard form	Expanded form	Expanded notation
52.037	50 + 2 + 0.03 + 0.007	(5 × 10) + (2 × 1) + (3 × 0.01) + (7 × 0.001)

Compare and order decimals to thousandths.

TEKS 5.2.B, 5.2.C

- Decimals can be compared and ordered to the thousandth using the symbols >, <, or =.
  - » The value of the digits in each place value across the base-ten place value system can be used to compare and order decimals.

Compare the following decimals.

5.021 **>** 5.02

5.021 has 1 thousandth more than 5.02, so it is greater.

Order the numbers 39.482, 37.959, and 37.062 from *least* to *greatest*.

37.062, 37.959, 39.482

Multiply decimals to the hundredths.

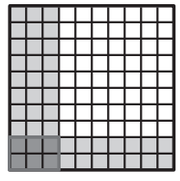
TEKS 5.3.D, 5.3.E

- Familiar whole number multiplication strategies can be used to multiply when one or more factors is a decimal.
  - » Area models and hundredths models can be used to decompose factors and represent the product.

6 × 0.25 = **1.50**

I know that 6 times 25 is 150, so 6 times 0.25 is 1.50.

0.20 × 0.3 = **0.06**



21.5 × 3.5 = **75.25**

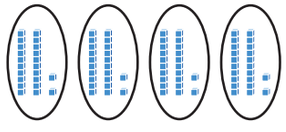
	20	1	0.5
3	60	3	1.5
0.5	10	0.5	0.25

Divide decimals to the hundredths.

TEKS 5.3.F, 5.3.G

- Familiar whole number division strategies can be used to divide decimals by whole numbers.
  - » Strategies such as the standard algorithm, can be used to solve for quotients of decimals to hundredths.

0.88 ÷ 4 = 0.22



2.36 ÷ 2 = 1.18

Area Model

	1	0.18
2	2	0.36

Standard Algorithm

$$\begin{array}{r} 1.\ 1\ 8 \\ 2\overline{)\,2.\ 3\ 6} \\ -\ 2 \\ \hline 0\ 3 \\ -\ 2 \\ \hline 1\ 6 \\ -\ 1\ 6 \\ \hline 0 \end{array}$$

Connections to Future Learning

Here is how the content in this unit connects to where your students are headed in their math journeys.

Locate, Compare, and Order Integers and Numbers

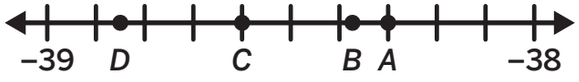
In this unit, students compare and locate decimals to thousandths on a number line. They recognize that tenths, hundredths, and thousandths can be represented in fraction and decimal form.

In Grade 6, students will use their understanding of fraction and decimal place value to locate, compare, and order integers and numbers on a number line.

TEKS: 6.2.C

Example:

Which point best represents $-38\frac{3}{5}$? Explain.



Point C best represents $-38\frac{3}{5}$. The number line is split into tenths, and point C is on the tick mark located at $-38\frac{6}{10}$, which is equivalent to $-38\frac{3}{5}$.

In this unit, students use their understanding of decimal place value to compare and order decimals to thousandths using >, <, or =.

In Grade 6, students will order a set of rational numbers in mathematical and real-world contexts. They use their understanding of decimal and fraction place value, as well as positive and negative rational numbers to order a set of numbers.

TEKS: 6.2.D

Example:

The weight of four puppies are shown in pounds. Order them from greatest to least.

Puppy Weights			
8.25	$8\frac{3}{8}$	8.5	$8\frac{5}{8}$

$8\frac{5}{8}$, 8.5, $8\frac{3}{8}$, 8.25

Order the following from least value to greatest value:

$-\frac{4}{7}$, −1.68, $-1\frac{1}{3}$, 0.77, $\frac{36}{8}$

-1.68, $-1\frac{1}{3}$, $-\frac{4}{7}$, 0.77, $\frac{36}{8}$

Add, Subtract, Multiply, and Divide Fluently

In this unit, students add, subtract, multiply, and divide decimals to the hundredths using objects, models, place value strategies, and algorithms.
In Grade 6, students will fluently add, subtract, multiply and divide integers using algorithms, including the standard algorithm for each operation.

TEKS: 6.3.D, 6.3.E

Example:

What is the value of the expression?

$68.04 \div 4$

$$\begin{array}{r} 17.01 \\ 4\overline{)68.04} \\ -\,4 \\ \hline 28 \\ -\,28 \\ \hline 00 \\ -\,00 \\ \hline 04 \\ -\,4 \\ \hline 0 \end{array}$$

$68.04 \div 4 =$ **17.01**

What is the value of the expression?

$(-6.75)(2) + (-9 - 4)$

$-13.5 + (-9 - 4)$

$-13.5 + -13$

-26.5

Unit Story

Every unit has a Unit Story to engage students and help them make connections between math and authentic contexts.

About the Story

Four enterprising kid entrepreneurs at Carvalho Elementary showcase their small businesses. The narrative follows aspiring reporter Fiona as she interviews different entrepreneurs from sub-unit to sub-unit about their passion for their businesses and how they got started.

Unit Story Read-Aloud

For the **Warm-Up of Lesson 1,** read aloud the Unit Story. Use the **Presentation Screens** for Lesson 1 to display the story images to introduce students to the characters.

The Math in the Story

Place Value Patterns and Decimal Operations

As Fiona interviews each kid entrepreneur, students have the opportunity to solve real-world problems in which they operate with decimals up to the hundredths.

Throughout the unit . . .

- Students solve problems involving Kara's miniatures, Miguel's scarves, Bobbi's comic books, and Jonathan's puzzles.
- Students solve problems about money and length to add, subtract, multiply, and divide with decimals.

Math Connections

Students will connect the math of the unit to the Unit Story in these activities:

- **Lesson 6, Activity 1**
- **Lesson 8, Activities 1 and 2**
- **Lesson 9, Activities 1 and 2**
- **Lesson 11, Activities 1 and 2**
- **Lesson 12, Activities 1 and 2**
- **Lesson 14, Activities 1 and 2**

Math Identity and Community

The Unit Story provides an opportunity for students to reflect on their math identity and share their experiences of being a part of a math community. Throughout the unit, you may wish to support students in their mathematical journey by asking them to reflect on the Math Identity and Community questions provided at the start of each lesson.

I am a doer of math.

How do you know when you have mastered a math skill? **(Lesson 8)**

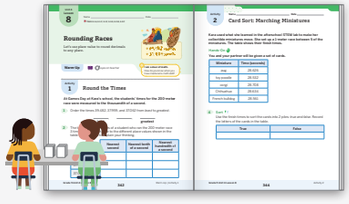
How do you decide which strategy to use when starting a new math problem? **(Lesson 17)**

Story Moments

Lesson 6 Activity 1

Math Connection

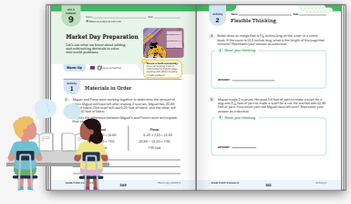
Students compare the weights of dog miniatures that Kara creates using her 3D printer.



Lesson 8 Activities 1 and 2

Math Connection

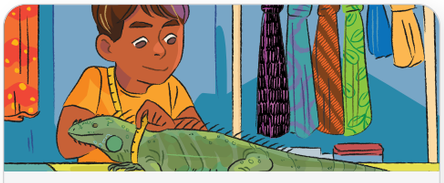
Students analyze statements about rounding the racing times of Kara's miniatures in seconds to determine whether they are true or false.



Lesson 9 Activities 1 and 2

Math Connection

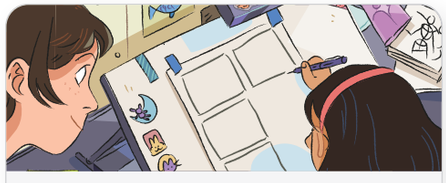
Students help the kid-makers prepare for Market Day by adding and subtracting decimals to determine the amount of materials they will need to make and sell their items.

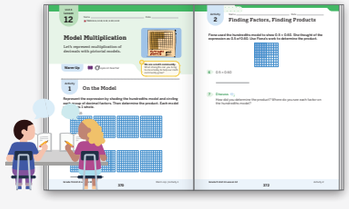


Lesson 11 Activities 1 and 2

Math Identity Connection

Bobbi has an advertisement section in her comic book. Students think flexibly about numbers and use familiar multiplication strategies to solve problems related to the advertisements in Bobbi's comic book.

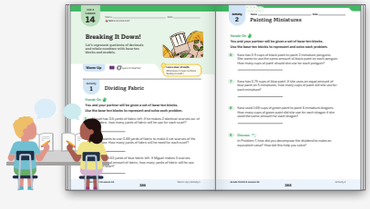




Lesson 12 Activities 1 and 2

Math Identity Connection

Miguel and Jonothan are buying materials to make their items for Market Day. Students help the kid-makers determine the total cost of their items by representing multiplication of decimal money amounts by whole numbers on hundredths models.



Lesson 14 Activities 1 and 2

Math Connection

Miguel is making scarves, and Kara is painting her miniatures. Students help the kid-makers divide decimals by whole numbers to determine the amount of fabric Miguel needs, and how much paint Kara needs to create their items.

Read this aloud during the **Warm-Up of Lesson 1, using the lesson's Presentation Screens.**

Read-Aloud Market Day

2

"Welcome back to MakerCast! You're kicking it with me—Fiona. Today, I'm going to talk about four of my favorite kid-makers at Carvalho Elementary's Market Day.

3

"First is Kara. She's 10 years old and makes custom 3D *miniatures*—little plastic dolls—of anything you want.

"At her table, she was selling little unicorns, goblins, shiny knights, goofy robots, scary-looking ogres, banjo-playing frogs and dozens more.

"Kara designs them, prints them, and even paints them herself.

4

"I asked Kara how she got into it. This is what she said:

" 'I play a lot of role-playing games with my friends. It was hard to find the miniatures we wanted. So, I learned to make them myself!'

Ask: *"What do you notice? What do you wonder?"*

5

" 'My favorite part about making minis are the details. It really teaches me to be patient. The smaller things are, the more careful you have to be to paint them.

You want to take your time and make sure everything is perfect.' "

6

"If you thought Kara is cool, wait till you check out my next interview.

7

"Miguel makes custom scarves out of beautiful prints that are soft, comfortable and stylish. But not just for humans. For animals too!

8

"Here's what Miguel had to say:

" 'Pets come in all sizes. A scarf for a parakeet is not going to be good for a golden retriever, for example. Every scarf needs to be sized just right. No one wants a scarf that's too short or too long. Everything needs to be cut perfectly.

Ask: *"What do you notice? What do you wonder?"*

9

" 'Some people say, *Miguel, what does a few millimeters here or there matter? After all, they're just animals!* But pets deserve to feel beautiful and confident too.' "

10

"For our next interview, we have Bobbi. Bobbi's comics have been making the rounds around Caravalho Elementary ever since she started drawing them in second grade!"

11

"Bobbi puts care and attention into every page of her comics. Here's what she had to say:

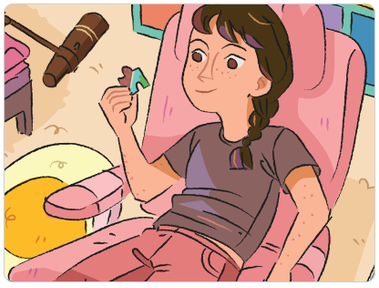
" 'I put myself in my reader's shoes, and ask how many panels I need to make the story fun and easy to follow.

12

" 'The art can be wild and chaotic if you know how to use the panels to make it orderly. Part of that is planning ahead. You only have so much room on a page. Sometimes you can't fit everything you want.' "

Ask: *"What do you notice? What do you wonder?"*

13



"And speaking of fitting stuff in, let me introduce you to Jonathan!

14

"Jonathan is new to Carvalho Elementary, but he's already making waves with his eye-popping puzzles. He takes pictures of interesting scenes around our town. With the help of his Uncle Omar, Jonathan turns them into jigsaw puzzles."

"Here's what Jonathan has to say about working with his family:

" 'We're a great team. I look for the best pictures and Uncle Omar uses the saw in his workshop to cut the picture up into neat, perfectly-matched pieces.

15

" 'The best part of puzzles is how it brings people together. My family and I have solved puzzles with hundreds and even thousands of pieces. Once we've finished, we even hang them up.'

Ask: *"What do you notice? What do you wonder?"*

16

"Well, that about wraps it up, listeners. All in all, I had a fantastic time at Carvalho Elementary's Market Day. I got to learn about how creative my classmates are, and I got an inside look at all the cool things they make and sell. I hope their stories have inspired you as much as they've inspired me.

"Until next time, this has been MakerCast. I'm Fiona, and I can't wait to hear about what *you're* making."

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Pre-Unit Check

Independent | 20 min

Facilitation: Assign the Pre-Unit Check to learn more about your students' understanding of foundational concepts and skills that will support them in Sub-Unit 1.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problem	Concept or skill	Preparation for	DOK	TEKS
1	Identifying different representations of a decimal	Lesson 4	1	4.2.B *(R)*
2	Representing decimals using visual models	Lesson 1	1	4.2.E *(S)*
3	Ordering decimals	Lesson 1	2	4.2.F *(S)*

Assessment Resources

- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources

Intervention and Extension Resources include:
- Mini-Lessons • Extensions

Centers Resources includes:
- Centers

Assessment Resource PDF

Digital

Unit 4
Pre-Unit Check

Name _____ Date _____

Pre-Unit Check

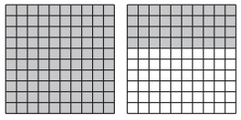
Unit 5.4

1 Select **TWO** representations that are equivalent to 502.04.

A. 500 + 2 + 0.04
B. (5 × 100) + (2 × 1) + (4 × 0.1)
C. (5 × 100) + (2 × 1) + (4 × 0.01)
D. 500 + 2 + 0.4

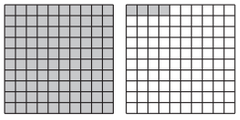
2 Determine the value of each model.

Model A



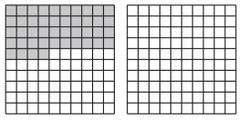
answer: 1.40

Model B



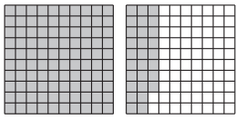
answer: 1.04

Model C



answer: 0.44

Model D



answer: 1.27

3 Write the 4 values from Problem 2 in order from GREATEST to LEAST.

1.4, 1.27, 1.04, 0.44

124

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D Differentiation (Pre-Unit Check)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goal(s)	Problem	Respond to Student Thinking
Preparation for Sub-Unit 1: • Read, write, and represent decimals to the thousandths, including in expanded form and expanded notation. • Compare and order two decimals to the thousandths using the symbols >, <, or =.	1	**Support** • **Mini-Lesson:** *Writing Numbers in Standard and Expanded Form* (Grade 4 ML 3.09) • **Teacher Move:** Students will have more opportunities to create multiple representations of decimals in Sub-Unit 1. • **Teacher Move:** Plan to spend more time in Lesson 4 to represent decimals in expanded form and expanded notation.
	2	**Support** • **Mini-Lesson:** *Representing and Writing Decimal Numbers to Hundredths* (Grade 4 ML 3.03)
	3	**Support** • **Mini-Lesson:** *Comparing and Ordering Decimals* (Grade 4 ML 3.08) • **Center:** *Get Your Numbers in Order, Decimals* • **Teacher Move:** Students will have more opportunities to order and compare decimals in Sub-Unit 1. • **Teacher Move:** Plan to spend more time in Lesson 1 to determine the value of hundredths models.

Watch Your Knowledge Grow (Optional)

Purpose: Students rate their understanding of the concepts that they will explore in this unit, prior to beginning the unit. Return to this page at the end of the unit and invite them to rate their understanding again to see how their knowledge has grown.

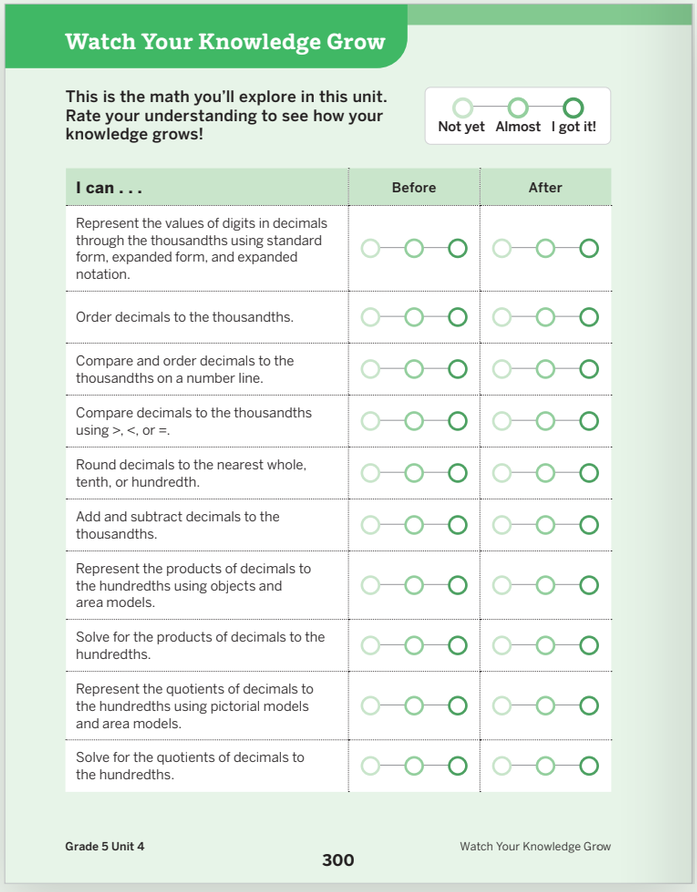
Read aloud the instructions. Let students know they are about to explore these math concepts in the upcoming unit.

Invite students to rate their understanding of each concept prior to beginning the unit. Let them know that they will return to this page at the end of the unit to rate their understanding again. They will be able to see how their knowledge has grown! Consider asking:

- "How have you added numbers before? Subtracted numbers?"
- "How have you seen tenths represented before? Hundredths? Thousandths?"

EB **Emergent Bilinguals** Invite students to circle or highlight words that may be unfamiliar to them, such as *expanded notation*. Let them know that it is a normal part of learning to not be familiar with words or concepts when they are first learning about them. When they return to this page at the end of the unit, celebrate how their language development has grown! **ELPS 3.A, 3.E**

Math Identity and Community Celebrate student thinking as they respond to your questions, including students who shared their thinking even though they may not have been sure yet. Invite students to share their "first draft thinking" with the class, such as "I know there are 2 groups of 6 in an egg carton."



Watch Your Knowledge Grow

This is the math you'll explore in this unit. Rate your understanding to see how your knowledge grows!

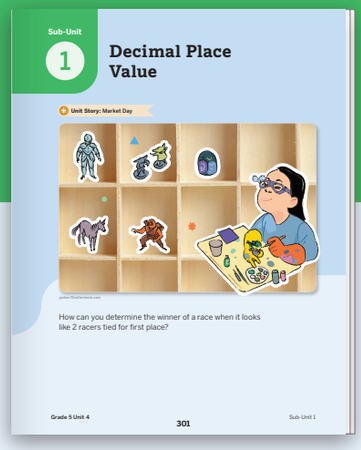
Not yet Almost I got it!

I can . . .	Before	After
Represent the values of digits in decimals through the thousandths using standard form, expanded form, and expanded notation.		
Order decimals to the thousandths.		
Compare and order decimals to the thousandths on a number line.		
Compare decimals to the thousandths using >, <, or =.		
Round decimals to the nearest whole, tenth, or hundredth.		
Add and subtract decimals to the thousandths.		
Represent the products of decimals to the hundredths using objects and area models.		
Solve for the products of decimals to the hundredths.		
Represent the quotients of decimals to the hundredths using pictorial models and area models.		
Solve for the quotients of decimals to the hundredths.		

Grade 5 Unit 4 300 Watch Your Knowledge Grow

Sub-Unit 1

Decimal Place Value



Sub-Unit 1 Goals

- Read, write, and represent decimals to the thousandths, including in expanded form and expanded notation.
- Compare and order two decimals to the thousandths using the symbols >, <, or =.
- Round decimals to the nearest whole, tenth, or hundredth.
- Add and subtract decimals to the hundredths using place value strategies.

Progression of TEKS in Sub-Unit 1

- **Lessons 1–4:** Students notice that tenths, hundredths, and thousandths in fraction and decimal form can represent the same value. They write decimals to the thousandths in expanded form and expanded notation to deepen their understanding of decimal place value.
- **Lessons 5–8:** Students extend their understanding of decimal place value to compare, order, and write comparison statements using >, <, or =. They apply their understanding of decimal place value to round decimals to the nearest wholes, tenths, and hundredths.
- **Lesson 9:** Students add and subtract decimals to the hundredths using place value strategies and the standard algorithm.

Sub-Unit 1 Progression	Lessons 1–3*	Lesson 4	Lesson 5*	Lesson 6	Lesson 7	Lesson 8	Lesson 9
Number and operations							
TEKS 5.2.A	●	●	○	○	○	○	○
TEKS 5.2.B	○	○	●	●	○	●	○
TEKS 5.2.C	○	○	○	○	●	●	○
TEKS 5.3.K	○	○	○	○	○	○	●

*This lesson builds toward the standard shown.

Coming up Next

- **Sub-Unit 2, Lessons 10–13:**
  - » Number operations: **TEKS 5.3.D, 5.3.E**
- **Sub-Unit 3, Lessons 14–17:**
  - » Number operations: **TEKS 5.3.A, 5.3.F, 5.3.G**

Math That Matters Most

Sub-Unit 1: Use place value to read, write, compare, and round decimals.

Progression of Strategies, Skills, or Language

Representing decimals in different ways, including expanded form and expanded notation.

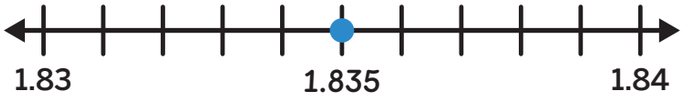
1.835

one and eight hundred thirty-five thousandths

$1 + 0.8 + 0.03 + 0.005$

$(1 \times 1) + \left(8 \times \frac{1}{10}\right) + \left(3 \times \frac{1}{100}\right) + \left(5 \times \frac{1}{1{,}000}\right)$

$(1 \times 1) + (8 \times 0.1) + (3 \times 0.01) + (5 \times 0.001)$



Comparing decimals to the thousandths using place value understanding and the symbols >, <, or =.

Kara creates miniatures of different dog breeds using her 3D printer.

Miniature	French bulldog	Chihuahua
Weight (ounces)	5.1	5.009

Both weights have 5 whole pounds, and the number of thousandths is different. 100 thousandths is greater than 9 thousandths, so 5.1 > 5.009.

Rounding multi-digit decimals to the thousandths to any place.

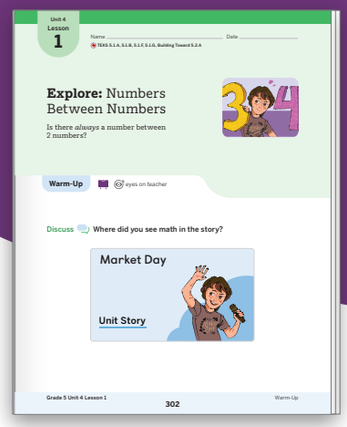
	Nearest second	Nearest tenth of a second	Nearest hundredth of a second
39.482 seconds	39	39.5	39.48
37.959 seconds	38	38	38.96

Adding and subtracting decimals using place value strategies and the standard algorithm.

0.82 + 0.59	5.61 + 2.63	8.87 − 2.08
1 82 hundredths + 59 hundredths 141 hundredths	1 5.61 + 2.63 8.24	7 17 8.~~87~~ − 2.08 6.79

Unit 4
Lesson
1

Student Edition pages and Presentation Screens support learning in this lesson.



Explore: Numbers Between Numbers

Is there *always* a number between 2 numbers?

Key Concepts

Today's Goals

1. **Goal:** Identify numbers between 2 whole numbers, including decimal values.
2. **Language Goal:** Explain how to use place value and fraction understanding to name decimal values up to and beyond the hundredths place. **(Listening and Speaking)** **ELPS 1.E, 2.E, 2.F**

To build curiosity and interest from the start of the unit, students engage in a non-routine task that elicits multiple strategies and solutions. They apply their own knowledge and language to a new mathematical task. Giving students a non-routine task with multiple answers and solution paths allows them to truly engage in the math process standards and invites all students to see themselves as mathematicians. **(TEKS 5.1.A)**

In this Exploration, students explore the density of numbers as they identify numbers between 2 whole numbers. Once they identify 2 consecutive whole numbers, students use their understanding of place value and fractions to identify and name decimals. **(TEKS 5.1.B, 5.1.F, 5.1.G)**

In Grade 4, students were introduced to the *ten times* relationship between whole-number place values. They also used decimals as notation for fractions with denominators of 10 or 100, and they compared 2 decimals to the hundredths. In this unit, students will build upon this work to read, write, and compare decimals to the thousandths and perform all 4 operations using decimals to the hundredths. In Grade 6, students will build fluency with the 4 operations involving decimals. This Exploration provides an opportunity to see students' skills and conceptual understanding of decimal place value.

Caregiver Connection

At home, students can explore numbers between numbers by considering whole number and decimal values. For example, students could think about an age between the ages of 2 friends or family members. Students could also consider the price of a good between 2 advertised prices.

Vocabulary

Review Vocabulary

decimal

fraction

TEKS

Building Toward

5.2.A

Represent the value of the digit in decimals through the thousandths using expanded notation and numerals

Math Process Standards: 5.1.A, 5.1.B, 5.1.F, 5.1.G

ELPS: 1.B, 1.E, 2.B, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F

Building On

4.2.B

Lesson at a Glance 60 min

TEKS: 5.1.A, 5.1.B, 5.1.F, 5.1.G, Building Toward 5.2.A

Warm-Up

Whole Class | 15 min

Students use the **Notice and Wonder** routine, after hearing the Unit Story read aloud. Because there is no single correct response, this invitational routine allows all students to share their mathematical curiosity about the unit narrative to which they will return throughout the unit.

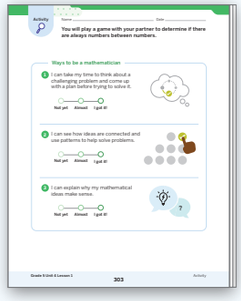
Materials: Unit Story, *Market Day*

Activity

Pairs | 45 min

Students play a game in which they identify numbers between 2 numbers, starting with 2 whole numbers. As the range narrows, students use their understanding of whole-number and fractional place values to identify and name values that represent parts of a whole.

Manipulative kit: base-ten blocks (as needed)
Materials: Activity PDF, chart paper, *Explore Organizer* PDF (optional), markers



Opportunities For Extension *(optional)*

Students can strategize how to make the longest or shortest list of values between any 2 whole numbers, such as 1–20, as in Round 1, or 1–5, as in Round 2.

Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity, Connect** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames
- ✓ Visuals

ELPS 1.E, 2.C, 2.E, 2.F

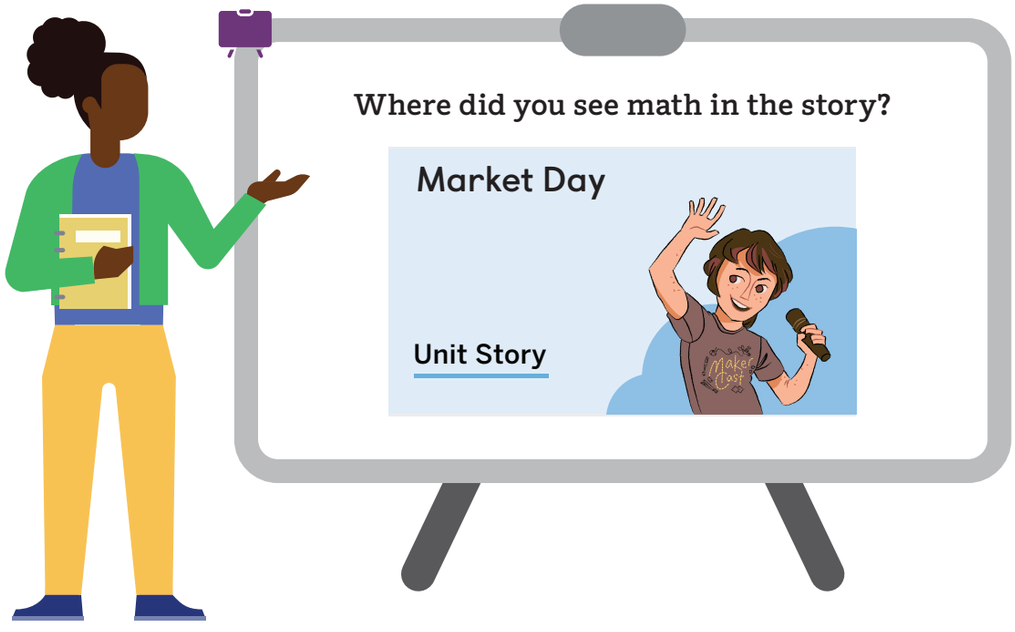
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 15 min

Presentation Screens

Warm-Up Notice and Wonder

Purpose: Students hear a read aloud of *Market Day*. They notice and wonder about mathematical situations in the story.



1 Launch

Display the cover of the Unit Story, *Market Day*.

Use the Think-Pair-Share routine. Ask, "What sorts of things do you make? What do you wish existed that you could create?"

Read aloud the Unit Story from this Teacher Edition, while displaying the illustrations on Screens 2–16. ELPS 1.E

Use the Notice and Wonder routine.

Pause on Screens 4, 8, and 12. Ask, "What do you notice? What do you wonder?"

2 Connect

Use the Think-Pair-Share routine. Ask, "Where did you see math in the story? What do you wonder about Fiona's podcast?"

Record students' responses as they share.

Say, "Fiona and her father were trying to isolate a noise between 13 and 17 seconds. Similarly, in this unit, you will explore numbers between numbers. Today, you will play a game in which you consider whether there are *always* numbers between 2 numbers."

Students might say . . . ELPS 2.B

I notice that Fiona interviews students who need to use math to make their products.

I notice that Miguel will need to carefully measure the necks of different-sized animals to help people choose the correct scarf.

I wonder how hard it is to make a miniature of an animal.

I wonder whether all the panels in Bobbi's comic books are the same size and shape.

Pairs | 45 min

Activity Is there *always* a number between 2 numbers?

Purpose: Students identify numbers between 2 numbers, starting with 2 whole numbers and consistently narrowing the range to require decimals. This prepares them to explore thousandths in the next lesson.

Presentation Screens

Materials

Lesson Resources:

- Distribute the Activity PDF to each student.
- Provide students with access to the *Explore Organizer* PDF (optional).
- Use chart paper and markers to create the class display during the Monitor.

Manipulative Kit:

- Provide students with access to base-ten blocks (as needed).

Make It Your Own!

This activity is written without a competitive element. This interaction could be changed to account for students' interests and developing math community and identity. Consider having students make the *longest* possible list of values between 1 and 5.

1 Launch

Read aloud the introduction. ELPS 1.E

Ask, "I chose 1, and my partner chose 20. What are 2 numbers that are between 1 and 20?"

Record students' answers in the middle column of the first row and in the first and third columns of the second row.

Ask, "What are 2 numbers between these 2 numbers?"

Record the values in the middle column of the second row and the first and third columns of the third row.

Say, "In Round 1, you and your partner will each choose a whole number between 1 and 20. In Round 2, choose a whole number between 1 and 5."

A **Accessibility: Conceptual processing** Provide access to base-ten blocks so students can build and represent numbers to determine which is greater or lesser.

EB **Emergent Bilinguals:** Students may be unfamiliar with the term *between*. Consider demonstrating this concept using student volunteers, asking a student to stand between two others while you say the term aloud. ELPS 1.B

2 Monitor

As students complete the activity, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "How could you visually represent your 2 numbers? How might that help you identify a number in between?"
- Ask, "What are some different ways to name part of a whole?"

MLR **MLR2: Collect and Display** ELPS 3.C, 3.D, 3.E, 3.F

- Collect the informal language students use to describe decimals less than hundredths.
- Display the informal language collected and keep it displayed throughout the lesson. Refer back to it in subsequent lessons as decimal language becomes more formalized.

3 Connect

Invite students to share how they identified and named numbers between 2 numbers less than 1. Select and sequence their responses using the *Differentiation* table. Record any new language on the class display.

Ask, "Will there always be another number between 2 numbers? Why or why not?"

Invite students to share their reflections. Provide the *Explore Organizer* PDF to those students who wish to write or draw their reflections.

Say, "There are always numbers between numbers, even if you cannot yet name them. In this unit, you will explore decimals smaller than hundredths."

Student Edition

Activity

Name _____ Date _____

You will play a game with your partner to determine if there are *always* numbers between numbers.

Ways to be a mathematician

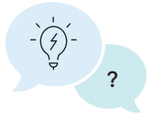
1. I can take my time to think about a challenging problem and come up with a plan before trying to solve it.

Not yet — Almost — I got it!

2. I can see how ideas are connected and use patterns to help solve problems.

Not yet — Almost — I got it!

3. I can explain why my mathematical ideas make sense.

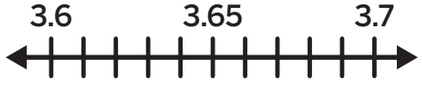


Not yet — Almost — I got it!

Grade 5 Unit 4 Lesson 1 303 Activity

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Use their understanding of decimal place value to name numbers to the tenths and hundredths.		**S Strengthen** Ask, "What might you call values that are between 3.6 and 3.61 on your number line?"
Reason that writing decimals with digits beyond the hundredths place is possible.	3.655 is between 3.65 and 3.66 because I can keep adding digits to show place values less than hundredths.	**S Strengthen** Ask, "How might you read that number using place value language?"
Use place value understanding and number sense to informally name decimals less than hundredths.	3.655 is 3.65 and half of a hundredth.	
Apply whole-number place value naming conventions to name decimals beyond the hundredths place.	3.655 is 3 and 655 thousandths because after hundreds is thousands, so after hundred*ths* is thousand*ths*.	**S Stretch** Ask, "Suppose your thinking will always work. What is the smallest decimal value you can name? What 2 decimals would that value be between?"
Use place value and fraction-multiplication reasoning to name decimals beyond the hundredths place.	$\frac{1}{10}$ of $\frac{1}{100}$ is $\frac{1}{10} \times \frac{1}{100}$, or $\frac{1}{1{,}000}$, so the next place value after hundredths is thousandths.	

Activity Sample Student Work

Students will likely represent their answer to the Explore question in different ways. Because this is the beginning of the unit, there is no expectation for students to choose certain types of numbers.

Is there *always* a number between 2 numbers?

Sample student responses:

Sample response 1

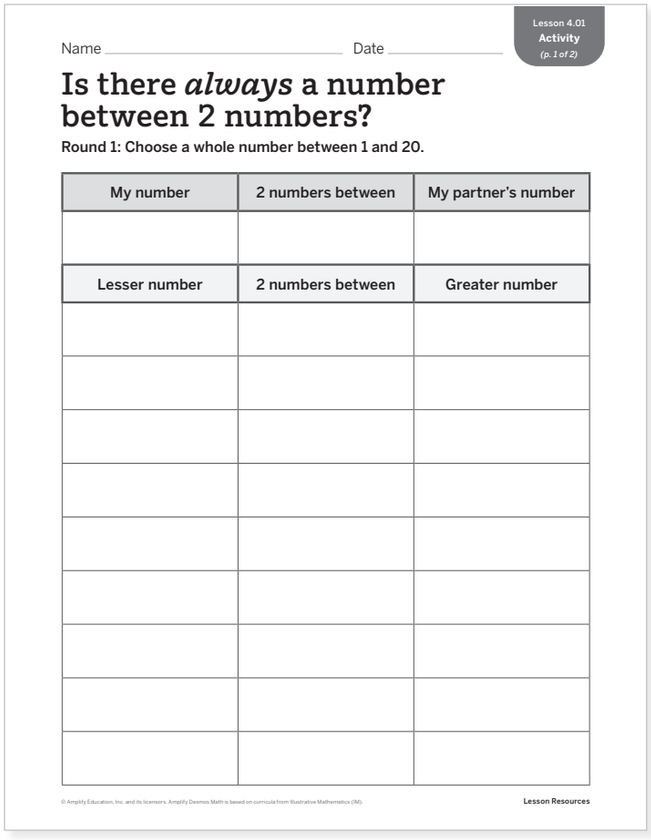
Lesser number	2 numbers between	Greater number
3.6	3.61, 3.69	3.7
3.63	3.64, 3.66	3.67
3.64	3.65	3.66
3.64	3.641, 3.642	3.65

Sample response 2

Lesser number	2 numbers between	Greater number
$3\frac{64}{100}$	$3\frac{641}{1,000}$, $3\frac{642}{1,000}$	$3\frac{64}{100}$

Sample response 3

Lesser number	2 numbers between	Greater number
3 and 64 hundredths	3 and 641 thousandths, 3 and 642 thousandths	3 and 65 hundredths



Lesson 4.01 Activity (p. 1 of 2)

Name _____ Date _____

Is there *always* a number between 2 numbers?

Round 1: Choose a whole number between 1 and 20.

My number	2 numbers between	My partner's number

Lesser number	2 numbers between	Greater number

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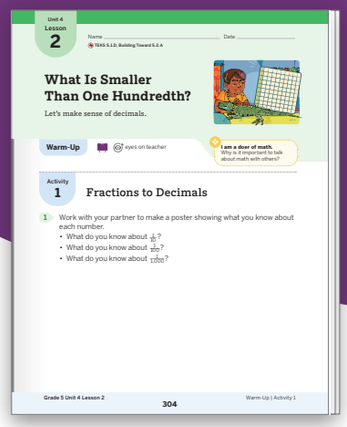
Lesson Resources

Activity PDF *Is there* always *a number between 2 numbers?*, available for student reference

Unit 4
Lesson
2

Student Edition pages and Presentation Screens support learning in this lesson.



What Is Smaller Than One Hundredth?

Making Sense of Thousandths

Let's make sense of decimals.

Key Concepts

Today's Goals

1. **Goal:** Recognize decimals to thousandths represented in different ways.
2. **Goal:** Extend place value understanding to include thousandths.
3. **Language Goal:** Explain the connections between the different ways to represent numbers to the thousandths. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E

Connections and Coherence

Students share what they know about one tenth, one hundredth, and one **thousandth** in fraction form. They see that one thousandth can also be represented as the decimal 0.001. Students are given a model partitioned into thousandths and represent the shaded portion in different ways, allowing them to see that a large number of thousandths can be decomposed into an equivalent number of tenths, hundredths, and thousandths. **(TEKS 5.1.D)**

Prior Learning

In Grade 4, students used place value understanding to consider fractions with denominators of 10 and 100. They represented tenths and hundredths with models, number lines, and decimal notation.

Future Learning

In Lesson 3, students will represent thousandths in words, expanded form, and expanded notation.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of representing numbers to thousandths with fractions and decimals.

Vocabulary

New Vocabulary

thousandths

Review Vocabulary

hundredths

tenths

TEKS

Building Toward

5.2.A

Represent the value of the digit in decimals through the thousandths using expanded notation and numerals.

Math Process Standard: 5.1.D

ELPS: 1.B, 1.E, 2.B, 2.C, 2.D, 2.E, 3.E

Building On

4.2.B

4.2.E

Building Math Identity

I am a doer of math.

Why is it important to talk about math with others?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.D, Building Toward 5.2.A

Warm-Up

Whole Class | 10 min

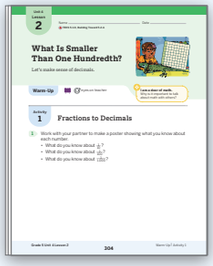
Students use the **Notice and Wonder** routine to share what they notice and wonder about a place value chart with a new place value missing.

Activity 1

Pairs | 20 min

Students explore **thousandths** by demonstrating what they already know about one tenth, one hundredth, and one thousandth in fraction form. They name one tenth, one hundredth, and one thousandth as fractions and decimals. Students recognize that thousandths are a very small unit.

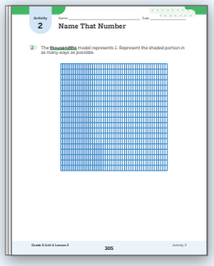
Materials: Activity 1 PDF (optional), tools to create a visual display



Activity 2

Pairs | 15 min

Students represent a shaded portion of thousandths on a model in different ways. They see that they can decompose a large number of thousandths into an equivalent number of tenths, hundredths, and thousandths.



Synthesis

Whole Class | 10 min

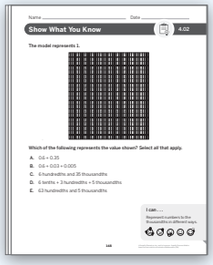
Students review and reflect on how thousandths fit into their understanding of place value.

Show What You Know

Independent | 5 min

Students demonstrate their understanding of identifying the written value of the shaded region of a model showing a decimal to the thousandths place.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Frayer model
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F

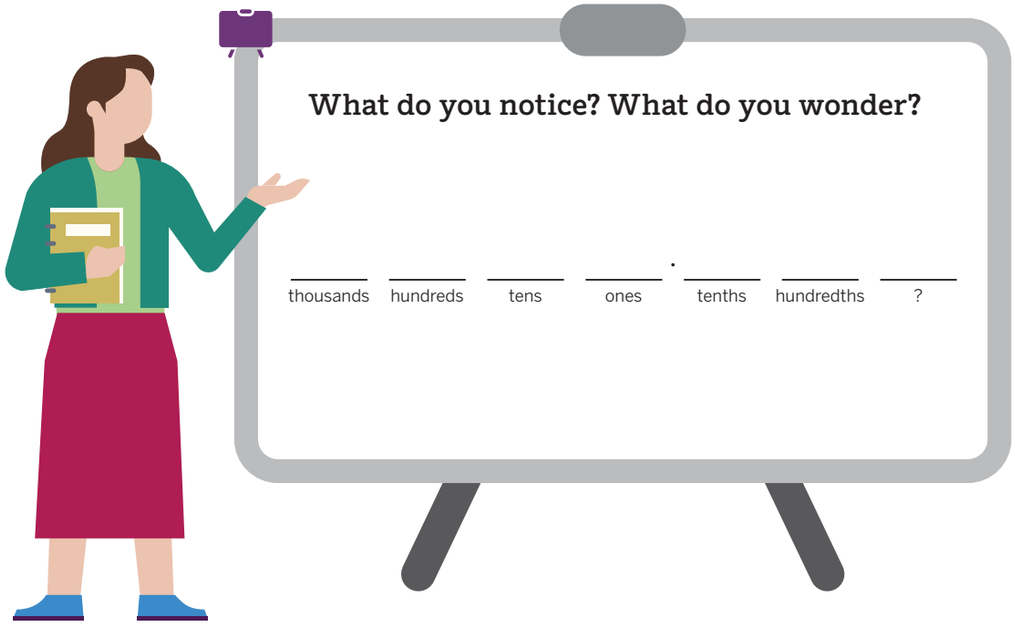
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

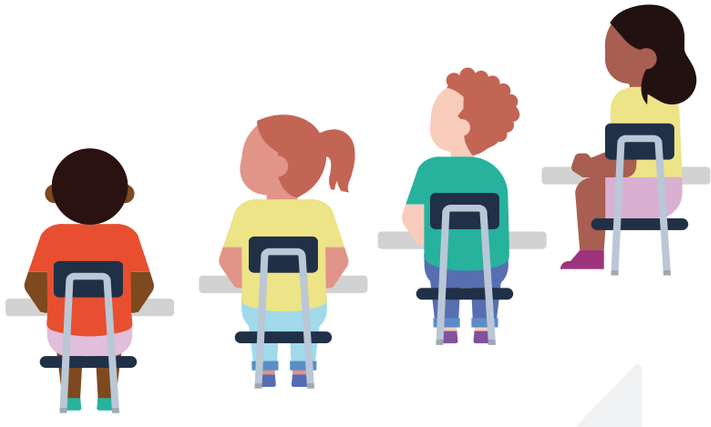
Whole Class | 20 min

Presentation Screen

Warm-Up Notice and Wonder

Purpose: Students examine a place value chart to prepare for a formal introduction to the thousandths place in Activity 1.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Ask, "What do you notice? What do you wonder?"

Use the Think-Pair-Share routine.

2 Connect

Record students' responses as they share.

Say, "Today, you will learn more about the missing place value."

Students might say . . . ELPS 2.B

I notice place values that include whole numbers and decimals.

I notice symmetry between tens and tenths and hundreds and hundredths.

I wonder what the name of the place value to the right of the hundredths place is.

I wonder how many more place values there are to the right of the hundredths place.

Pairs | 20 min

Activity 1 Fractions to Decimals

Purpose: Students demonstrate what they know about $\frac{1}{10}$, $\frac{1}{100}$, and $\frac{1}{1{,}000}$ using models, drawings, or words. They see that $\frac{1}{1{,}000}$ can be written as 0.001.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the Activity 1 PDF (optional).

Classroom materials

- Provide students with tools to create a visual display.

1 Launch

Read aloud Problem 1.

Say, "Create a poster with your partner showing what you know about each number."

EB **Emergent Bilinguals:** If possible, pair students with different levels of English language proficiency together. This will provide a structured opportunity for multilingual learners to interact with and receive feedback from their peers with varied backgrounds. ELPS 1.E, 2.C, 2.D

A **Accessibility: Executive functioning** Have students verbalize a plan for how they will create their poster, including what drawings, models, or descriptions they want to include.

2 Monitor

While students complete the activity, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What can you draw to represent $\frac{1}{10}$?"

3 Connect

MLR **MLR7: Compare and Connect** ELPS 1.B, 1.E, 2.B, 2.D, 2.E

Invite students to share their posters, explaining how they represented each number.

Use the Think-Pair-Share routine. Ask:

- "What do you notice about how each drawing represents the decimal?"
- "How can the representations of $\frac{1}{10}$ and $\frac{1}{100}$ inform your understanding of $\frac{1}{1{,}000}$?"
- "How can you write $\frac{1}{1{,}000}$ as a decimal? How do you know?"

Key Takeaway: Say, "One **thousandth** is the base-ten place value equal to $\frac{1}{1{,}000}$. One thousandth can also be written as 0.001."

Student Edition

Unit 4
Lesson
2

Name _____ Date _____

TEKS 5.1.D, Building Toward 5.2.A

What Is Smaller Than One Hundredth?

Let's make sense of decimals.

Warm-Up eyes on teacher

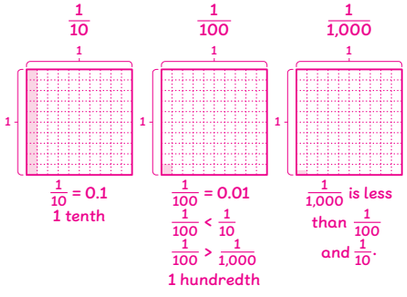
I am a doer of math.
Why is it important to talk about math with others?

Activity
1

Fractions to Decimals

1 Work with your partner to make a poster showing what you know about each number. **Sample response shown.**

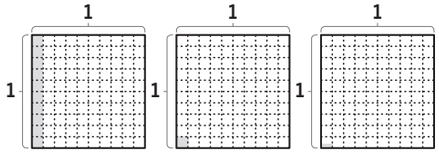
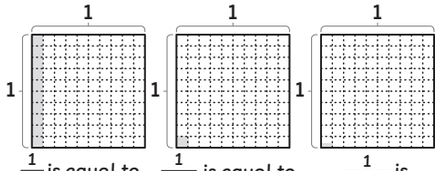
- What do you know about $\frac{1}{10}$?
- What do you know about $\frac{1}{100}$?
- What do you know about $\frac{1}{1,000}$?



Grade 5 Unit 4 Lesson 2 304 Warm-Up | Activity 1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Include 1 representation for each number.		**S Strengthen** Ask, "How could you use place value and decimal notation to write $\frac{1}{1,000}$ as a decimal?"
Include multiple representations or descriptions for each number.	 $\frac{1}{10}$ is equal to the decimal 0.1. $\frac{1}{100}$ is equal to the decimal 0.01. It is less than $\frac{1}{10}$ and greater than $\frac{1}{1,000}$. $\frac{1}{1,000}$ is the least.	**S Stretch** Ask, "How do you know that all of the representations are equivalent?"

Pairs | 15 min

Activity 2 Name That Number

Purpose: Students represent a shaded portion of a model in different ways. They see that a large number of thousandths is composed of tenths, hundredths, and thousandths.

Presentation Screens

Short on time? Consider prompting students to represent the shaded portion 3 different ways and then discuss additional ways as a class.

1 Launch

Read aloud Problem 2.

Say, "Complete Problem 2 with your partner."

2 Monitor

While students complete the activity, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What does each column represent? What does each small square represent? What does each small rectangle represent?"

3 Connect

Invite students to share their responses to Problem 2. Select and sequence their responses using Rows 2 and 3 in the *Differentiation* table.

Record students' responses.

A **Accessibility: Visual-spatial processing** While students share their responses, use color-coding to highlight how the responses are connected.

Ask, "What connections do you notice between the different ways to represent 0.325?"

Key Takeaway: Say, "Just like whole numbers, you can decompose decimal numbers in different ways. A large number of thousandths can be decomposed into an equivalent number of tenths, hundredths, and thousandths."

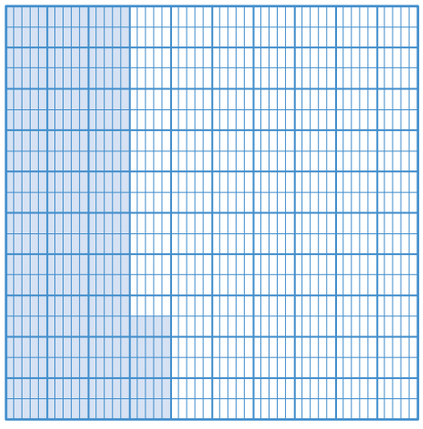
Student Edition

Activity 2

Name _____ Date _____

Name That Number

2 The **thousandths** model represents 1. Represent the shaded portion in as many ways as possible. **Sample response shown.**



3 tenths + 2 hundredths + 5 thousandths
32 hundredths + 5 thousandths
30 hundredths and 25 thousandths
325 thousandths
0.3 + 0.02 + 0.005
0.325
$\frac{325}{1,000}$

Grade 5 Unit 4 Lesson 2 305 Activity 2

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Interpret the value with whole numbers.	325 32 + 5	**Support** Ask, "If the model represents 1, is the total greater or less than 1? How can you revise your work?"
Include the standard or word form of the total value.	0.325 $\frac{325}{1,000}$ 325 thousandths	**Strengthen** Ask, "How can you decompose the total in different ways?"
Include expressions decomposing the total value in different ways.	0.3 + 0.02 + 0.05 30 hundredths and 25 thousandths 3 tenths + 2 hundredths + 5 thousandths	**Stretch** Ask, "How would the number change if an additional fully-shaded model were part of the number?"

Whole Class | 10 min

Presentation Screen

Synthesis

Lesson Takeaway: A model divided into 100 equal parts can be used to represent any combination of tenths, hundredths, or **thousandths**. $\frac{1}{1,000}$ can be represented as the decimal 0.001.

Ask:

- "What is the missing place value?"
- "What do you know about the thousandths place?"

Record students' responses.

Say, "The thousandths place is another decimal place value and it is to the right of the hundredths place. Thousandths are less than hundredths and can be represented as the decimal 0.001."

Formalize vocabulary: **Thousandths** are the base-ten place value equal to $\frac{1}{1000}$. One thousandth is written as 0.001.

(optional) **Consider using the Word Connections: Making Predictions routine** with the word **thousandths**. Consider asking, "What word do you see inside the word *thousandths*? How can you use this word structure to make a prediction as to how the terms *thousand* and *thousandth* are similar or different?" **ELPS 3.E**

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

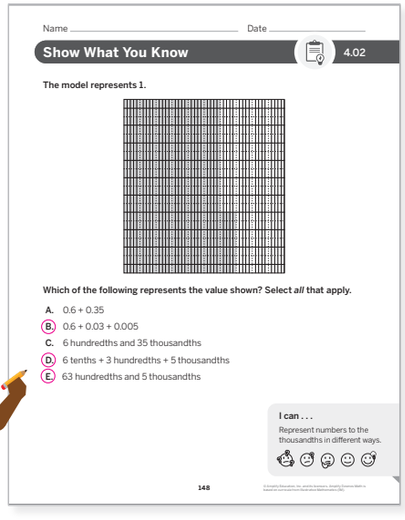
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.02

The model represents 1.

Which of the following represents the value shown? Select *all* that apply.

A. 0.6 + 0.35
B. 0.6 + 0.03 + 0.005
C. 6 hundredths and 35 thousandths
D. 6 tenths + 3 hundredths + 5 thousandths
E. 63 hundredths and 5 thousandths

I can . . .
Represent numbers to the thousandths in different ways.

148

Today's Goals

1. **Goal:** Recognize decimals to thousandths represented in different ways.
   - In the *Show What You Know*, students identified all correct representations of a decimal to the thousandths.
2. **Goal:** Extend place value understanding to include thousandths.
3. **Language Goal:** Explain the connections between the different ways to represent numbers to the thousandths. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

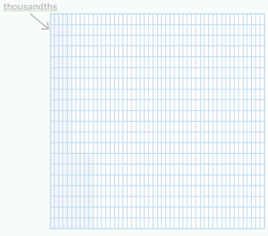
Lesson 2
Practice

Students using digital

Students using print

Summary 4.02

You can represent 1 thousandth as the fraction $\frac{1}{1,000}$ and as the decimal 0.001. A large number of **thousandths** can be decomposed in different ways.



0.135 can be decomposed in different ways.

- 1 tenth + 3 hundredths + 5 thousandths
- 0.1 + 0.03 + 0.005
- 13 hundredths and 5 thousandths

thousandth The base-ten place value equal to $\frac{1}{1,000}$. One thousandth is written as 0.001.

Practice 4.02

For Problems 1–3, write the fraction as a decimal.

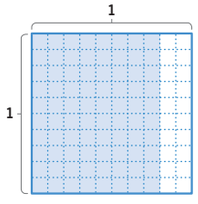
1. $\frac{1}{10}$ 0.1
2. $\frac{1}{100}$ 0.01
3. $\frac{1}{1,000}$ 0.001

Practice 4.02

Name _____ Date _____

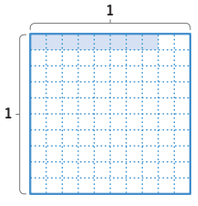
For Problems 4–6, represent the shaded portion as a decimal.
Each whole model represents a value of 1. Sample responses shown.

4.



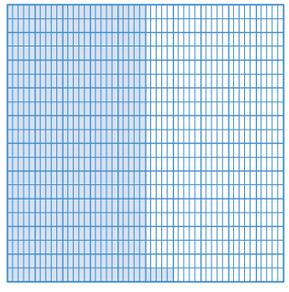
answer: 0.80

5.



answer: 0.08

6.

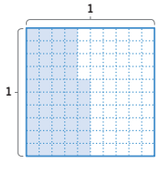


answer: 0.505

Practice 4.02

Name _____ Date _____

7. The whole model represents a value of 1.



Select *all* that represent the shaded region of the model.

- (A) 0.406
- (B) 0.046
- (C) 0.460
- (D) $\frac{460}{1,000}$
- (E) 4 tenths and 6 hundredths
- (F) 46 thousandths

Spiral Review

8. Han has $\frac{1}{4}$ of a jar of marbles. He shares the amount equally with his sister. How much of the jar does Han have left?

Record your answer in the space provided.

$\frac{1}{8}$ jars

For Problems 9 and 10, determine the value of the unknown.

9. $p = [552 - (8 \times 24)] \div 9$

$[552 - 192] \div 9$
$360 \div 9$
40
answer: 40

10. $y = (57 + 24)6$

$81(6)$

$$\begin{array}{r} 81 \\ \times \quad 6 \\ \hline 486 \end{array}$$

answer: 486

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–7	1	5.2.A*
Spiral Review			
Test Practice	8	1	5.3.L
Fluency	9, 10	2	5.4.B, 5.4.F

*This problem builds toward the standard shown.

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 2

Lesson Goal: Recognize decimals to thousandths represented in different ways.

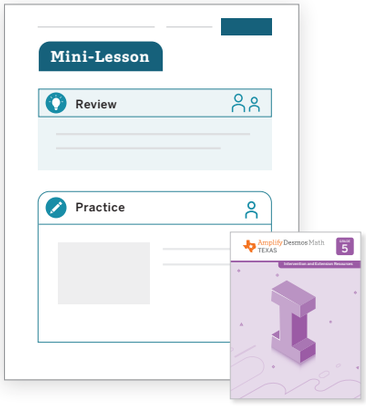
Support

Provide targeted intervention for students by using these resources.

If students decompose thousandths 1 way:

Respond:

- Assign the *Representing Decimals* **Mini-Lesson. |** 15 min
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



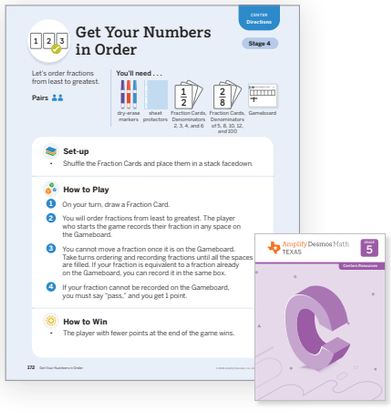
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students decompose thousandths in different ways:

Respond:

- Invite students to play these **Centers. |** 15 min
  Get Your Numbers in Order: Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100
  Greatest of Them All: Decimals to Hundredths
  Mystery Number: Six-Digit Numbers
- Have students complete **Lesson 2 Practice. |** 15 min
- **Item Bank**



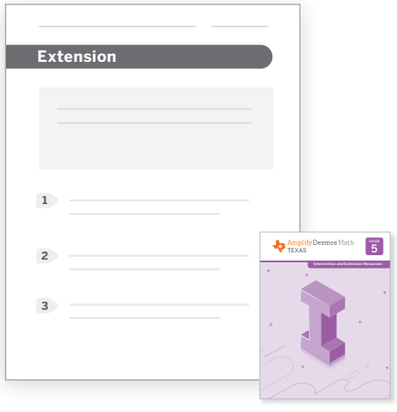
Stretch

Challenge students and extend their learning with these resources.

If students justify how all the ways to decompose are equivalent:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

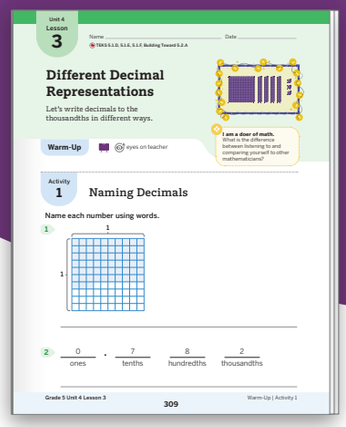
- English/Spanish cognates
- Frayer model templates
- Vocabulary routines

Professional Learning

Think about a recent time in class when your students were confused. What did you do to support them in reasoning about their confusion as a community of learners?

Unit 4
Lesson
3

Student Edition pages and Presentation Screens support learning in this lesson.



Different Decimal Representations

Expanding Thousandths

Let's write decimals to the thousandths in different ways.

Key Concepts

Today's Goals

1. **Goal:** Read and write decimals to the thousandths, including in expanded form and expanded notation.
2. **Language Goal:** Use place value reasoning to justify why a variety of different words, numbers, and expressions represent the same decimal value. **(Listening and Speaking)** **ELPS 1.E, 2.E, 2.F**

Connections and Coherence

Students represent decimals less than 1 with words. They then use place value understanding to determine whether different words, numbers, and expressions represent a decimal to the thousandths. Students build upon their work decomposing in Lesson 2 to recognize that a decimal can be decomposed into addends that represent the value of each digit. **(TEKS 5.1.D, 5.1.E, 5.1.F)**

Prior Learning

In Grade 4, students represented whole numbers using expanded notation. In Lesson 2, students expanded their place value understanding to include thousandths and decomposed a number of thousandths in different ways.

Future Learning

In Lesson 4, students will continue to develop their understanding of various representations of decimals through the thousandths place, and their equivalence.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of different ways to represent decimals to the thousandths as they sort decimal values by which represent and which do not represent a given number.

Vocabulary

Review Vocabulary

expanded form
expanded notation
hundredths
tenths
thousandths

TEKS

Building Toward

5.2.A

Represent the value of the digit in decimals through the thousandths using expanded notation and numerals.

Math Process Standards: 5.1.D, 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.C, 3.D

Building On

4.2.B

Building Math Identity

I am a doer of math.

What is the difference between listening to and comparing yourself to other mathematicians?

Invite students to reflect on this question as they complete this lesson.

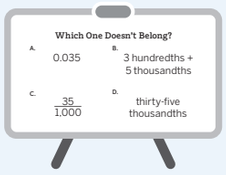
Lesson at a Glance 60 min

TEKS: 5.1.D, 5.1.E, 5.1.F, 5.1.G, Building Toward 5.2.A

Warm-Up

Whole Class | 10 min

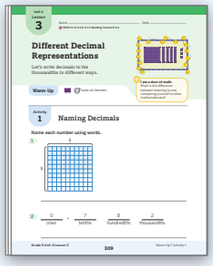
Students use the **Which One Doesn't Belong?** routine to compare 4 different forms of a decimal less than 1. They should be encouraged to use precise language as they give their reasons for the one they chose. **(TEKS 5.1.G)**



Activity 1

Pairs | 15 min

Students represent decimals less than 1 with words. They see that naming a decimal using its number name is similar to naming whole numbers, but a decimal's name must include its smallest place value.

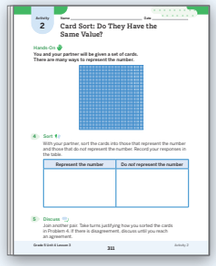


Activity 2

Pairs | 20 min

Students use place value understanding to determine whether decimals represented in words, expanded form, and expanded notation represent a decimal shown using a model. As they connect forms, students recognize different ways to represent the value of each digit.

Materials: Activity 2 PDF



Synthesis

Whole Class | 10 min

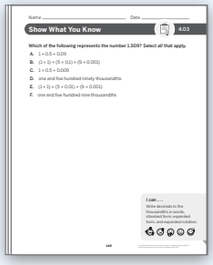
Students review and reflect on making connections between how a decimal greater than 1 is read aloud and its word form.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by determining which expanded form, expanded notation, and word forms represent a given decimal.

Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

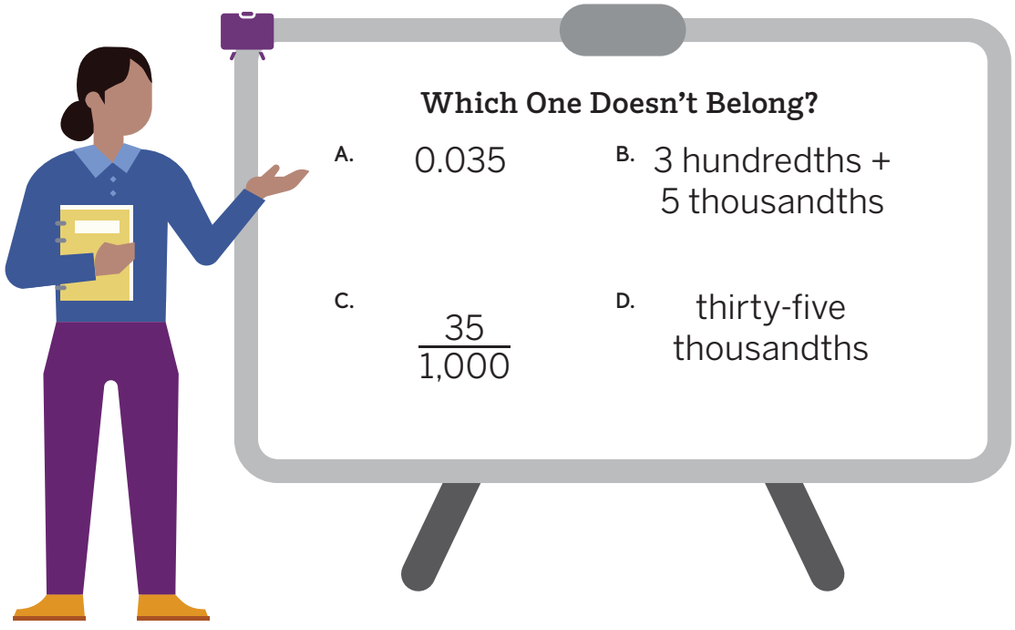
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screens

Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare 4 forms of the same decimal value, preparing them to read and write decimals to the thousandths using words.



1 Launch

Display the 4 forms.

Use the Which One Doesn't Belong? routine.

Say, "Choose one that doesn't belong. Be ready to share your reasoning."

2 Connect

Record students' responses as they share.

Ask, "How are Forms C and D related?"

Students might say . . . ELPS 2.C, 2.D, 2.E

A: *It is the only one that shows the number in standard form.*

B: *It is the only one that shows an expression.*

C: *It is the only one that shows a fraction.*

D: *It is the only one written only with words.*

Pairs | 15 min

Presentation Screens

Activity 1 Naming Decimals

Purpose: Students record numbers using words. They recognize that naming decimals with words is similar to naming whole numbers.

1 Launch

Read aloud the directions.

Say, "Complete Problems 1–3 with your partner."

EB **Emergent Bilinguals:** Encourage students to locate and read classroom labels that include number words, including math tools. ELPS 3.C, 3.D

2 Monitor

After students have completed **Problem 2**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "If the model represents 1, what number do you see?"

3 Connect

Invite students to share their responses to Problem 2.

Record students' responses.

Ask, "How is representing decimals with words similar to representing whole numbers? How is it different?"

MLR **MLR8: Discussion Supports — Make a Conjecture** ELPS 2.B, 2.C, 2.D, 2.E

Ask students to make a conjecture about how to represent decimals with words. Have them share their conjectures with a partner and discuss the following questions:

- "How do you know whether your conjecture is always true?"
- "Are there any counterexamples that show this conjecture is false?"

A **Accessibility: Conceptual processing** Guide processing by inviting students to identify the details they want to remember. Provide sentence frames, such as "The next time I need to represent a decimal with words, I will . . ."

Key Takeaway: Say, "Just like with whole numbers and decimals involving tenths and hundredths, you can apply your place value understanding to read decimals to the thousandths place."

Student Edition

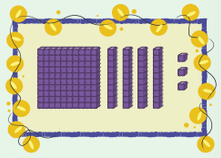
Unit 4 Lesson 3

Name _____ Date _____

TEKS 5.1.D, 5.1.E, 5.1.F, Building Toward 5.2.A

Different Decimal Representations

Let's write decimals to the thousandths in different ways.



I am a doer of math. What is the difference between listening to and comparing yourself to other mathematicians?

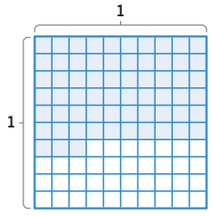
Warm-Up eyes on teacher

Activity 1

Naming Decimals

Name each number using words.

1



sixty-three hundredths

2

0	.	7	8	2
ones		tenths	hundredths	thousandths

seven hundred eighty-two thousandths

Activity 1

Name _____ Date _____

Naming Decimals (continued)

3 Discuss

Priya and Han discussed how they would represent the number.

0	.	8	3	0
ones		tenths	hundredths	thousandths

- Priya would represent the number as *0.08 + 0.03*.
- Han would represent the number as *eight hundred thirty thousandths*.

Who is correct? How do you know?

Oral activity: No writing expected. Sample response shown.

Han is correct. Han represented the number as the total number of thousandths. Priya made a mistake with her place value because eight tenths is not equal to 0.08.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Use expanded form with words.	**7 tenths + 8 hundredths + 2 thousandths**	**Support** Ask, "How would you read the number aloud?"
Represent the number with words.	**seven hundred eighty-two thousandths** **782 thousandths**	**Stretch** Ask, "How would your description change if the digit in the ones place was 6?"

Pairs | 20 min

Activity 2 Card Sort: Do They Have the Same Value?

Purpose: Students sort cards to determine which representations represent a given value and which do not, allowing them to explore equivalence across different words, numbers, and expressions.

Presentation Screens

Materials

Lesson Resources:

- Distribute one set of pre-cut cards from the Activity 2 PDF to each pair.

Short on time? Consider omitting Problems 6–7.

1 Launch

Read aloud the introduction and Problem 4, clarifying that each card will appear in only 1 category in the table.

Say, "You will complete Problem 4 with your partner, and then join another pair to complete Problem 5. You will then complete Problems 6 and 7 with your partner."

EB **Emergent Bilinguals:** Use intentional grouping so students with different English language proficiency levels can interact with peers with more advanced proficiency. **ELPS 1.E, 2.C, 2.D**

A **Accessibility: Visual-spatial processing** Encourage students to first sort the cards by similar types (words, expanded form, etc.) Then invite them to discuss each card within a certain type to determine whether the value shown represents 0.15.

2 Monitor

After students have completed **Problem 7**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What is the value of the number shown on the model?"
- Ask, "What else do you know about the number 0.863? Where do you see that information on the cards?"

3 Connect

Ask, "How does the expression on Card N represent Cards E and K?"

Record students' responses as they share.

Ask, "How are these expressions similar? How are they different?"

Record students' responses as they share.

Key Takeaway: Say, "The value of each digit in decimals through the thousandths place can be represented, using place value understanding, in many different ways."

Student Edition

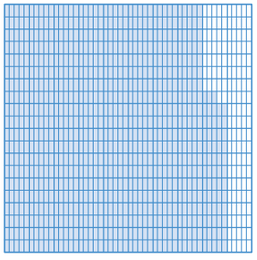
Activity 2

Name _____ Date _____

Card Sort: Do They Have the Same Value?

Hands-On

You and your partner will be given a set of cards. There are many ways to represent the number.



4 Sort

With your partner, sort the cards into those that represent the number and those that do *not* represent the number. Record your responses in the table.

Represent the number	Do *not* represent the number
B, C, D, E, F, J, K, O, N, Q	A, G, H, I, L, M, P

5 Discuss Oral activity: No writing expected.

Join another pair. Take turns justifying how you sorted the cards in Problem 4. If there is disagreement, discuss until you reach an agreement.

Activity 2

Name _____ Date _____

Card Sort: Do They Have the Same Value? (continued)

6 Which expression from the Card Sort represents the number in expanded form?

$0.8 + 0.06 + 0.003$

7 Which 3 expressions from the Card Sort represent the number in expanded notation?

Expression 1: $(8 \times 0.1) + (6 \times 0.01) + (3 \times 0.001)$

Expression 2: $\left(8 \times \frac{1}{10}\right) + \left(6 \times \frac{1}{100}\right) + \left(3 \times \frac{1}{1{,}000}\right)$

Expression 3: $(0 \times 1) + (8 \times 0.1) + (6 \times 0.01) + (3 \times 0.001)$

Presentation Screens

D Differentiation | Teacher Moves

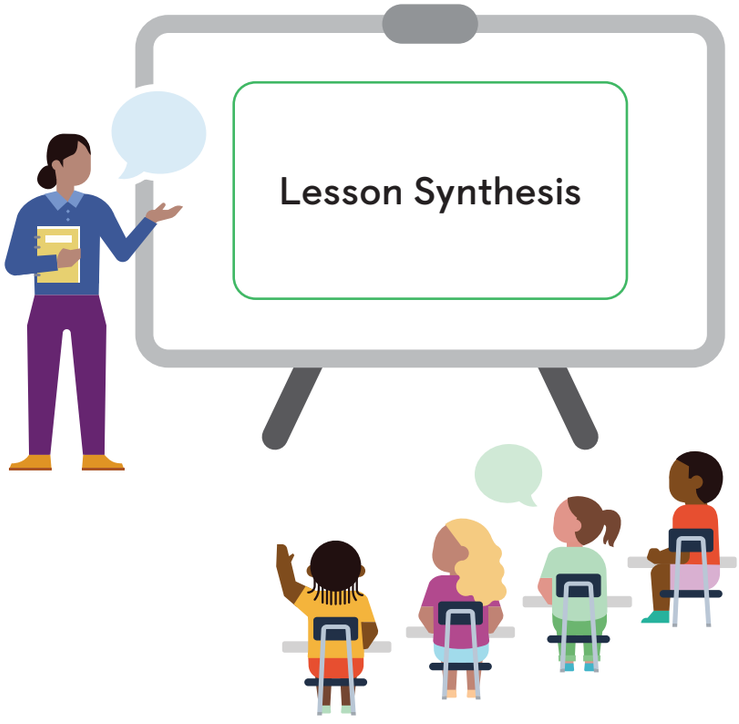
Look for students who . . .	For example . . .	Provide support . . .
Almost there Include any word form examples.	**8 tenths and 63 thousandths** **863 thousandths**	**Support** Ask, "If expanded notation means to represent the amounts of each place value, which expressions match your examples?"
Include all expanded notation expressions.	$(8 \times 0.1) + (6 \times 0.01) + (3 \times 0.001)$ $\left(8 \times \frac{1}{10}\right) + \left(6 \times \frac{1}{100}\right) + \left(3 \times \frac{1}{1{,}000}\right)$ $(0 \times 1) + (8 \times 0.1) + (6 \times 0.01) + (3 \times 0.001)$	**Stretch** Ask, "How would the expression $(8 \times 0.1) + (6 \times 0.01) + (3 \times 0.001)$ change if the number included 5 ones?"

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Like whole numbers, a decimal can be written in a variety of ways — with words, in standard form, in expanded form, or in expanded notation. Each way represents the same value.



Say, "3 students read aloud the number shown." ELPS 1.E

Ask, "Who read the number correctly? How do you know?"

Say, "Representing decimals greater than 1 with words means including the whole number part *and* the decimal part. The decimal part must include the smallest place value."

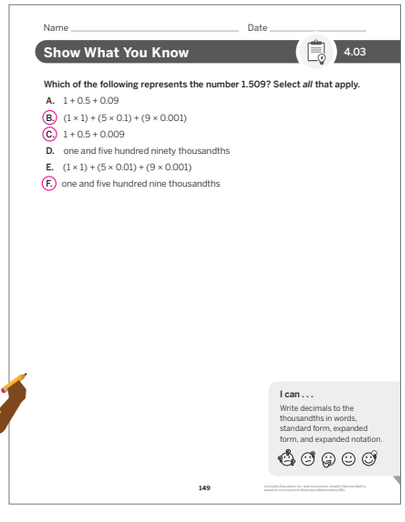
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.03

Which of the following represents the number 1.509? Select *all* that apply.

A. 1 + 0.5 + 0.09
B. (1 × 1) + (5 × 0.1) + (9 × 0.001)
C. 1 + 0.5 + 0.009
D. one and five hundred ninety thousandths
E. (1 × 1) + (5 × 0.01) + (9 × 0.001)
F. one and five hundred nine thousandths

I can . . .
Write decimals to the thousandths in words, standard form, expanded form, and expanded notation.

149

Today's Goals

1. **Goal:** Read and write decimals to the thousandths, including in expanded form and expanded notation.
   - In the *Show What You Know*, students identified all correct representations of a decimal to the thousandths.
2. **Language Goal:** Use place value reasoning to justify why a variety of different words, numbers, and expressions represent the same decimal value. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 3
Practice

Students using digital

Students using print

Summary 4.03

You can represent a decimal in many forms, including standard form, expanded form, and expanded notation. Expanded form and expanded notation decompose a number to represent the value of each digit.

The model represents 1 whole.

Standard form	0.145
Expanded form	0.1 + 0.04 + 0.005
Expanded notation	$(1 \times 0.1) + (4 \times 0.01) + (5 \times 0.001)$ $\left(1 \times \frac{1}{10}\right) + \left(4 \times \frac{1}{100}\right) + \left(5 \times \frac{1}{1{,}000}\right)$

Practice 4.03

1 Write 2.837 in expanded form and expanded notation.
Sample response shown.

2 + 0.8 + 0.03 + 0.007

$(2 \times 1) + \left(8 \times \frac{1}{10}\right) + \left(3 \times \frac{1}{100}\right) + \left(7 \times \frac{1}{1{,}000}\right)$

Practice 4.03

Name _____ Date _____

2 Write 0.809 in expanded form and expanded notation.

0.8 + 0.009

$\left(8 \times \frac{1}{10}\right) + \left(9 \times \frac{1}{1{,}000}\right)$ or $(8 \times 0.1) + (9 \times 0.001)$

3 Select *all* the ways to represent (5 × 0.01) + (7 × 0.001).

- (A) 5 tenths and 7 hundredths
- (B) 5 hundredths and 7 thousandths
- (C) 0.057
- (D) (5 × 0.1 + 7 × 0.01)
- (E) 57 hundredths
- (F) 57 thousandths
- (G) 0.05 + 0.007
- (H) 0.5 + 0.07

4 Select *all* the ways to represent (7 × 0.1) + (2 × 0.001).

- (A) (7 × 0.1 + 2 × 0.01)
- (B) 72 hundredths
- (C) 0.7 + 0.02
- (D) 7 tenths and 2 thousandths
- (E) 0.702
- (F) 0.7 + 0.002
- (G) 702 thousandths
- (H) 7 tenths and 2 hundredths

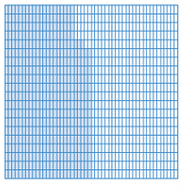
5 Write 0.583 in words.

five hundred eighty-three thousandths

Practice 4.03

Name _____ Date _____

6 Write 3 different ways to represent the number shown. Sample response shown.



0.478

(4 × 0.1) + (7 × 0.01) + (8 × 0.001)

0.4 + 0.07 + 0.008

Spiral Review

7 The model is shaded to represent half of a park. That half of the park will be turned into 4 new soccer fields. Which equation can be used to determine the fraction of the whole park each soccer field will be?

- (A) $\frac{1}{2} \times 8 = \frac{8}{2}$
- (B) $\frac{1}{2} \times 4 = \frac{4}{2}$
- (C) $\frac{1}{2} \div 8 = \frac{1}{16}$
- (D) $\frac{1}{2} \div 4 = \frac{1}{8}$

8 Solve for the product using the standard algorithm.

$$\begin{array}{r} 320 \\ \times\ 24 \\ \hline 1280 \\ +\ 6400 \\ \hline 7{,}680 \end{array}$$

answer: 7,680

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–4	2	5.2.A
	5	2	5.2.A*
	6	2	5.2.A
Spiral Review			
Test Practice	7	1	5.3.J
Fluency	8	1	5.3.B

*This problem builds toward the standard shown.

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 3

Lesson Goal: Read and write decimals to the thousandths, including in expanded form and expanded notation.

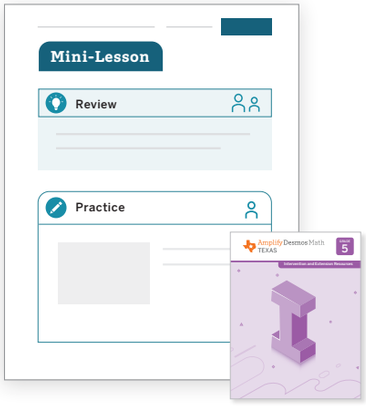
Support

Provide targeted intervention for students by using these resources.

If students select 1 way to read or write decimals to the thousandths place:

Respond:

- Assign the *Writing Decimals in Expanded Notation* **Mini-Lesson. |** 15 min
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students select 2 ways to read or write decimals to the thousandths place:

Respond:

- Invite students to play these **Centers. |** 15 min
  Get Your Numbers in Order: Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100
  Greatest of Them All: Decimals to Hundredths
  Mystery Number: Decimals
- Have students complete **Lesson 3 Practice. |** 15 min
- **Item Bank**

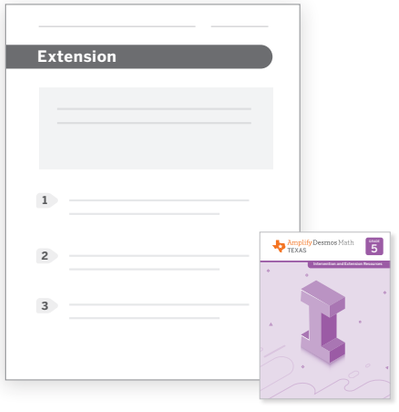
Stretch

Challenge students and extend their learning with these resources.

If students select 3 ways to read or write decimals to the thousandths place:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

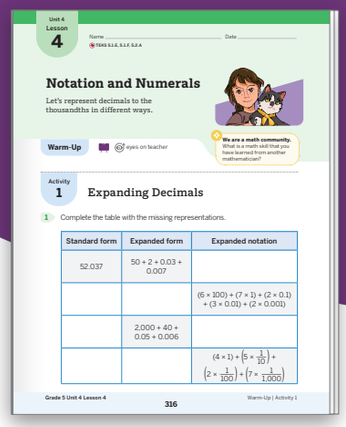
- English/Spanish cognates
- Frayer model templates
- Vocabulary routines

Professional Learning

What connections did students make between the different representations shared? What questions did you ask to help make the connections more visible?

Unit 4
Lesson
4

Student Edition pages and Presentation Screens support learning in this lesson.


Unit 4 Lesson 4

Notation and Numerals

Let's represent decimals to the thousandths in different ways.

Warm-Up

Activity 1 Expanding Decimals

1 Complete the table with the missing representations.

Standard form	Expanded form	Expanded notation
52.037	50 + 2 + 0.03 + 0.007	
		(6 × 100) + (7 × 1) + (2 × 0.1) + (3 × 0.01) + (2 × 0.001)
	2,000 + 40 + 0.05 + 0.006	
		$(4 \times 1) + \left(5 \times \frac{1}{10}\right) + \left(2 \times \frac{1}{100}\right) + \left(7 \times \frac{1}{1,000}\right)$

Grade 5 Unit 4 Lesson 4 316 Warm-Up | Activity 1

Notation and Numerals

Representing Decimals in Expanded Form, Expanded Notation, and With Numerals

Let's represent decimals to the thousandths in different ways.

Key Concepts

Today's Goals

1. **Goal:** Represent decimals to the thousandths using expanded notation and numerals.
2. **Language Goal:** Explain how expanded form and expanded notation represent the same number. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use place value understanding to represent decimals to the thousandths in standard form, expanded form, and expanded notation. They analyze and connect these representations to recognize that decimals to the thousandths can be represented in different ways and still represent the same value. Students then apply this understanding to real-world scenarios, creating representations of decimals to the thousandths in context. **(TEKS 5.1.E, 5.1.F)**

Prior Learning

In Lesson 3, students represented decimals less than 1 with words and determined whether different words, numbers, and expressions represented the same decimal.

Future Learning

In Lesson 5, students will locate and label decimals to the thousandths on number lines.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of different ways to represent decimals to the thousandths by creating multiple representations for the same number, with and without context.

Vocabulary

Review Vocabulary

expanded form

expanded notation

standard form

TEKS

Addressing

5.2.A

Represent the value of the digit in decimals through the thousandths using expanded notation and numerals.

Math Process Standards: 5.1.E, 5.1.F, 5.1.G

ELPS: 1.B, 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.D, 3.F

Building On

4.2.B

Building Math Identity

We are a math community.
What is a math skill that you have learned from another mathematician?

Invite students to reflect on this question as they complete this lesson.

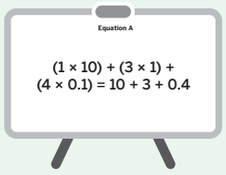
Lesson at a Glance 60 min

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.2.A

Warm-Up Fluency

Whole Class | 10 min

Students use the **True or False?** routine, in which they determine whether a series of equations are true or false and justify their responses. **(TEKS 5.1.G)**

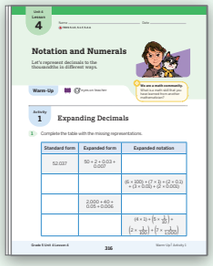


Activity 1

Pairs | 20 min

Students create missing representations of decimals to the thousandths in a table using standard form, expanded form, and expanded notation. They then analyze the similarities and differences of the representations.

Materials: *Activity 1 PDF* (as needed)



Activity 2

Pairs | 15 min

Students represent decimals to the thousandths in standard form, expanded form, and expanded notation in the context of various real-world scenarios. They explain how the different forms represent the same value.

Synthesis

Whole Class | 10 min

Students review and reflect on the different methods of representing decimals to the thousandths. They consider how the representations change when a component of the number changes.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by completing a table with missing representations of decimals to the thousandths using standard form and expanded notation.

Materials: *Show What You Know* PDF

Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

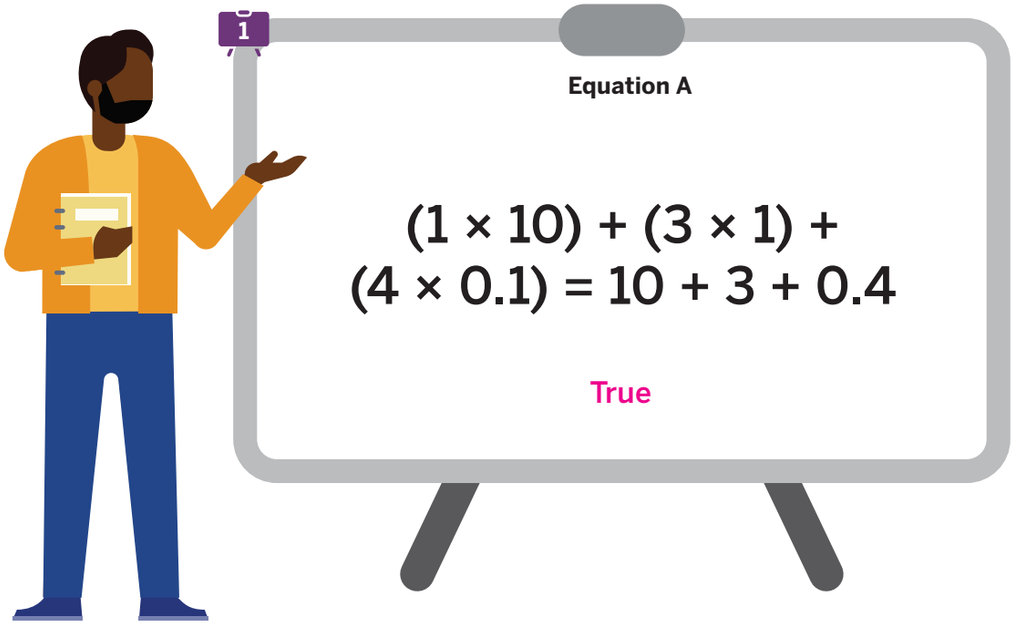
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screens

Warm-Up True or False? Fluency

Purpose: Students analyze equations involving expanded notation and expanded form of decimals, without evaluating, to develop concepts of place value and number representation.



Equation B

300 + 40 + 0.01 = (3 × 100) + (4 × 10) + (1 × 0.1)

False

Equation C

4,000 + 1 + 0.03 = (4 × 1,000) + (1 × 10) + (3 × 0.01)

False

Equation D

(1 × 10,000) + (4 × 100) + (3 × $\frac{1}{10}$) = 10,000 + 400 + 0.3

True

Why these problems? These equations lend themselves to building understanding of equivalence across expanded form and expanded notation.

1 Launch

Use the True or False? routine.

Display 1 equation at a time.

Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

Record 2 or 3 students' responses, asking for their reasoning and allowing others to agree or disagree. Keep each equation displayed as you progress to the next.

Repeat with each equation.

Use the Think-Pair-Share routine. Ask (if not mentioned in the discussion), "Look at Equation B. What change could be made to make the equation true? What about Equation C? How do you know?"

Students might say . . . ELPS 2.B, 2.C, 2.D, 2.E

A: True. I know that the value of 1 group of 10 is 10, 3 groups of 1 is 3, and 4 groups of 0.1 is 0.4.

B: False. I notice that the value of 0.01 is not the same as 1 group of 0.1.

C: False. I notice that the left side of the equation has 1 one, but the right side does not have any ones, which is not equal.

D: True. The value of one group of ten thousands is 10,000, 4 groups of 100 is 400, and 3 groups of $\frac{1}{10}$ is 0.3.

Pairs | 20 min

Activity 1 Expanding Decimals

Purpose: Students continue to develop their understanding of place value relationships by representing decimals to the thousandths in a table using standard form, expanded form, and expanded notation.

Presentation Screens

Materials

- Provide students with access to the Activity 1 PDF (as needed).

1 Launch

Say, "Complete the table with your partner, creating the missing representations for each decimal."

A **Accessibility: Conceptual processing** Provide access to the Activity 1 PDF for students who would benefit from using a place value chart.

EB **Emergent Bilinguals:** Create a classroom display that shows a visual of each representation and the representation name. Encourage students to use the chart to support them in understanding the meaning of the terms. ELPS 3.D, 3.F

2 Monitor

While students complete **Row 3**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "How can you use the information in the table to complete the first row?"
- Ask, "What do you know about the value of 52.037?"

3 Connect

Invite students to share their responses and strategies from Row 3.

MLR **MLR7: Compare and Connect** ELPS 1.B, 1.E, 2.B, 2.D, 2.E

Display the different representations of the number 2,040.056 (standard form, expanded form, and expanded notation). Ask:

- "What is the same about each of these representations?"
- "What is different about each of these representations?"

Key Takeaway: Say, "Standard form, expanded form, and expanded notation are all ways to represent a number. Standard form shows the place value position of each digit. Expanded form shows the value of each digit other than 0 in an addition expression. Expanded notation shows the sum of the products of each digit and its place value."

Student Edition

Unit 4
Lesson
4

Name _____ Date _____

TEKS 5.1.E, 5.1.F, 5.2.A

Notation and Numerals

Let's represent decimals to the thousandths in different ways.

Warm-Up

eyes on teacher

We are a math community. What is a math skill that you have learned from another mathematician?

Activity
1

Expanding Decimals

1 Complete the table with the missing representations.
Sample response shown.

Standard form	Expanded form	Expanded notation
52.037	50 + 2 + 0.03 + 0.007	(5 × 10) + (2 × 1) + (3 × 0.01) + (7 × 0.001)
607.232	600 + 7 + 0.2 + 0.03 + 0.002	(6 × 100) + (7 × 1) + (2 × 0.1) + (3 × 0.01) + (2 × 0.001)
2,040.056	2,000 + 40 + 0.05 + 0.006	(2 × 1,000) + (4 × 10) + (5 × 0.01) + (6 × 0.001)
4.527	4 + 0.5 + 0.02 + 0.007	$(4 \times 1) + \left(5 \times \frac{1}{10}\right) + \left(2 \times \frac{1}{100}\right) + \left(7 \times \frac{1}{1{,}000}\right)$

Grade 5 Unit 4 Lesson 4 316 Warm-Up | Activity 1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the amount as 2,456.	Standard form: **2,456** Expanded form: 2,000 + 40 + 0.05 + 0.006 Expanded notation: **(2 × 1,000) + (4 × 100) + (5 × 10) + (6 × 1)**	**Support** Ask, "How are you representing the value of 40 in your work? The value of 0.05?"
Represent the amount in standard form and expanded notation.	Standard form: **2,040.056** Expanded form: 2,000 + 40 + 0.05 + 0.006 Expanded notation: **(2 × 1,000) + (4 × 10) + (5 × 0.01) + (6 × 0.001)**	**Stretch** Ask, "How would the number change if there were an additional 0.1? 0.01?"

Pairs | 15 min

Activity 2 Equivalent Representations

Purpose: Students continue to explore equivalence as they represent decimals to the thousandths from real-world scenarios using standard form, expanded form, and expanded notation.

Presentation Screens

Short on time? Consider completing Problems 3 and 4 as a class after students have completed Problem 2 in pairs.

1 Launch

Say, "For Problems 2–4, work with your partner to write each number in standard form, expanded form, and expanded notation."

2 Monitor

After students have completed **Problem 2**, refer to the **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How can you use your work from Problem 1 to get started?"
- Ask, "How would you read this number aloud? How can the way it sounds help you represent the number?"

3 Connect

Invite students to share their responses and strategies for Problem 2.

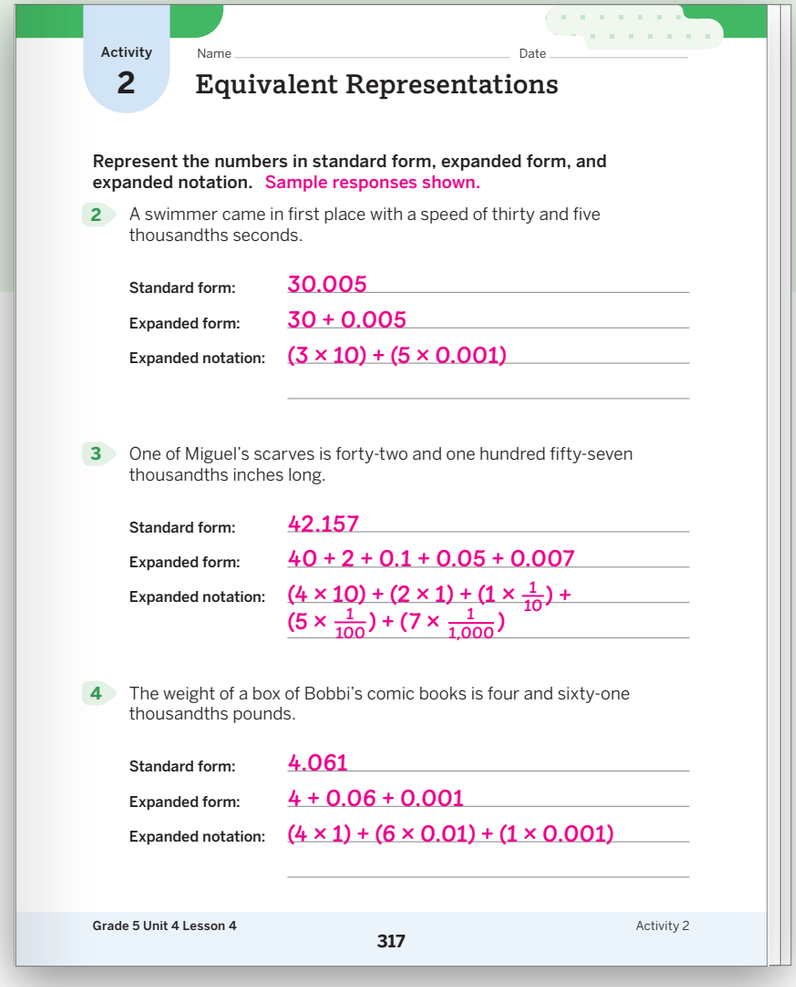
Display the expanded form representation of 30.005.

Use the Think-Pair-Share routine. Ask:

- "How could you represent this number in standard form? In expanded form?"
- "How do you know that all of these represent the same number?"

Key Takeaway: Say, "Expanded form and expanded notation expressions are equivalent if they can be represented with the same number in standard form."

Student Edition



Activity 2

Name _____ Date _____

Equivalent Representations

Represent the numbers in standard form, expanded form, and expanded notation. Sample responses shown.

2 A swimmer came in first place with a speed of thirty and five thousandths seconds.

Standard form: 30.005

Expanded form: 30 + 0.005

Expanded notation: (3 × 10) + (5 × 0.001)

3 One of Miguel's scarves is forty-two and one hundred fifty-seven thousandths inches long.

Standard form: 42.157

Expanded form: 40 + 2 + 0.1 + 0.05 + 0.007

Expanded notation: $(4 \times 10) + (2 \times 1) + (1 \times \frac{1}{10}) + (5 \times \frac{1}{100}) + (7 \times \frac{1}{1{,}000})$

4 The weight of a box of Bobbi's comic books is four and sixty-one thousandths pounds.

Standard form: 4.061

Expanded form: 4 + 0.06 + 0.001

Expanded notation: (4 × 1) + (6 × 0.01) + (1 × 0.001)

Grade 5 Unit 4 Lesson 4 317 Activity 2

Presentation Screens

D Differentiation | Teacher Moves

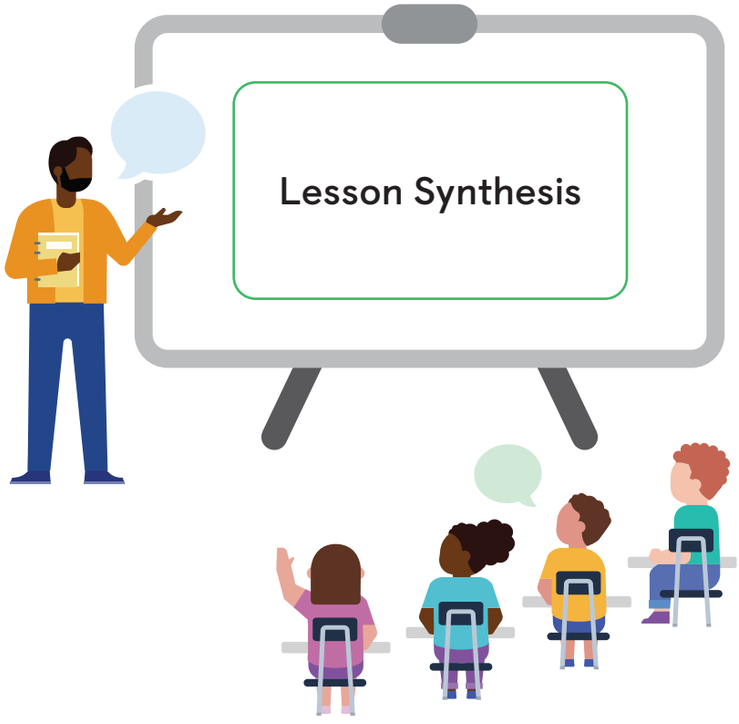
Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the amount as being equal to 35,000.	35,000 30,000 + 5,000 (3 × 10,000) + (5 × 1,000)	**Support** Ask, "What do you know about the term thousandths? How can you demonstrate that in your work?"
Almost there Represent 30.005 in standard form and expanded form.	30.005 30 + 0.005	**Support** Ask, "How could you represent the amounts of each place value?"
Represent 30.005 in standard form, expanded form, and expanded notation	30.005 30 + 0.005 (3 × 10) + (5 × 0.001)	**Stretch** Ask, "If another swimmer had a time of 30.055 seconds, would they have won the race? How do you know?"

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Decimals can be represented in a variety of ways, including with numerals, expanded form, and expanded notation. All of these representations are equivalent when they represent the same value.



Use the Think-Pair-Share routine. Ask:

- "What do you notice about the representations?"
- "How would the representations change if there were 2 hundredths instead of 1? How do you know?"

Say, "A decimal can be represented in different ways, including standard form, expanded form, and expanded notation. Expanded notation and expanded form are reprentations of a number in which the value of each digit is represented."

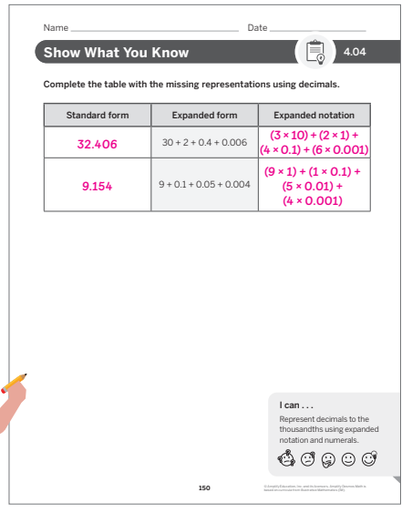
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF



Name _____ Date _____

Show What You Know 4.04

Complete the table with the missing representations using decimals.

Standard form	Expanded form	Expanded notation
32.406	30 + 2 + 0.4 + 0.006	(3 × 10) + (2 × 1) + (4 × 0.1) + (6 × 0.001)
9.154	9 + 0.1 + 0.05 + 0.004	(9 × 1) + (1 × 0.1) + (5 × 0.01) + (4 × 0.001)

I can . . .
Represent decimals to the thousandths using expanded notation and numerals.

150

Today's Goals

1. **Goal:** Represent decimals to the thousandths using expanded notation and numerals.
   - In the *Show What You Know*, students represented decimals to the thousandths in numerals and expanded notation by completing the missing parts of a table.
2. **Language Goal:** Explain how expanded form and expanded notation represent the same number. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 4
Practice

Students using digital

Students using print

Summary 4.04

Decimals to the thousandths can be represented in standard form, expanded form, and expanded notation. When they represent the same value, they are equivalent.

Standard form	2.379
Expanded form	2 + 0.3 + 0.07 + 0.009
Expanded notation	• (2 × 1) + (3 × 0.1) + (7 × 0.01) + (9 × 0.001) • $(2 \times 1) + \left(3 \times \frac{1}{10}\right) + \left(7 \times \frac{1}{100}\right) + \left(9 \times \frac{1}{1{,}000}\right)$

Practice 4.04

1 Consider these expressions.

(8 × 10) (4 × 0.1) (7 × 0.001)

In which number do the digits 8, 4, and 7 have the same values as those shown in the expressions?

(A) 86.047 (B) 813.457

(C) 82.47 (D) 280.437

Grade 5 Unit 4 Lesson 4 318 Summary | Practice

Practice 4.04 Name _____ Date _____

2 A gymnast received a score of 30.425. Represent the score in expanded notation. Sample response shown.

(3 × 10) + (4 × 0.1) + (2 × 0.01) + (5 × 0.001)

3 The fastest runner finished a race seventy-six thousandths of a second faster than the runner in second place. Represent the time in standard form, expanded form, and expanded notation. Sample response shown.

Standard form: 0.076

Expanded form: 0.07 + 0.006

Expanded notation: $\left(7 \times \frac{1}{100}\right) + \left(6 \times \frac{1}{1{,}000}\right)$

4 The table shows decimals and expanded notation. Choose the decimals that are correctly represented in expanded notation.

Select **THREE** correct answers.

Decimal	Expanded notation
○ 42.706	(4 × 10) + (2 × 1) + (7 × 0.1) + (6 × 0.01)
● 8.174	(8 × 1) + (1 × 0.1) + (7 × 0.01) + (4 × 0.001)
● 300.009	(3 × 100) + (9 × 0.001)
○ 92.012	(9 × 10) + (2 × 1) + (1 × 0.1) + (2 × 0.01)
● 0.485	(4 × 0.1) + (8 × 0.01) + (5 × 0.001)

5 Write 500 + 20 + 0.6 + 0.008 in standard form.

520.608

Grade 5 Unit 4 Lesson 4 319 Practice

Practice 4.04 Name _____ Date _____

Spiral Review

6 Jonathan sells his 100-piece puzzles for $3 each and his 1,000-piece puzzles for $6 each.

- At the beginning of the day, Jonathan started with some money from previous sales.
- He sold sixteen 100-piece puzzles and seven 1,000-piece puzzles.
- He purchased a comic book from Bobbi for $9.
- He ended the day with $112.

Write an equation that can be used to find m, the amount of money Jonathan had at the beginning of the day. Sample response shown.

$m + (3 \times 16) + (7 \times 6) - 9 = 112$

For Problems 7 and 8, determine the value of the unknown. Sample work shown.

7 $g = 1{,}065 \div 15 - 3$

$$\begin{array}{r} 71 \\ 15\overline{)1065} \\ -105\downarrow \\ \hline 15 \\ -\ 15 \\ \hline 0 \end{array}$$

71 − 3 = 68

answer: 68

8 $n = (14 \times 7) - 76$

$$\begin{array}{r} 2 \\ 14 \\ \times\ \ 7 \\ \hline 98 \end{array}$$

98 − 76 = 22

answer: 22

Grade 5 Unit 4 Lesson 4 320 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	2	5.2.A
	2, 3	1	5.2.A
Test Practice	4	2	5.2.A
	5	1	5.2.A
Spiral Review			
	6	2	5.4.B
Fluency	7, 8	2	5.4.B, 5.4.F

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 4

Lesson Goal: Represent decimals to the thousandths using expanded notation and numerals.

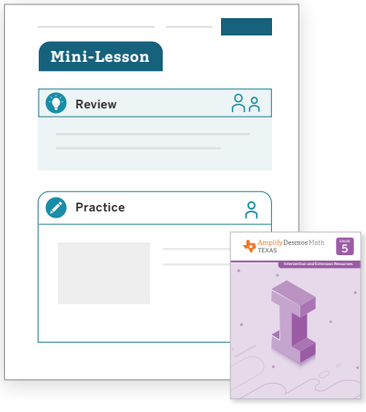
Support

Provide targeted intervention for students by using these resources.

If students represent the decimals as whole numbers:

Respond:

- Assign the *Writing Decimals in Expanded Form and Expanded Notation* **Mini-Lesson. |** 15 min
- Review the connection between parts of a whole and decimal notation.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students represent using numerals and expanded notation shown with fractions:

Respond:

- Invite students to play these **Centers. |** 15 min
  Get Your Numbers in Order: Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100
  Greatest of Them All: Decimals to Hundredths
  Mystery Number: Decimals
- Have students complete **Lesson 4 Practice. |** 15 min
- **Item Bank**

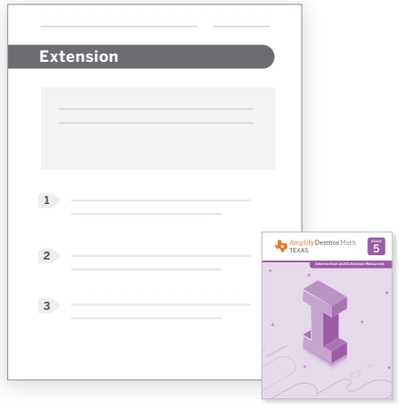
Stretch

Challenge students and extend their learning with these resources.

If students represent using numerals and expanded notation shown with decimals:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer model templates
- Vocabulary routines

Professional Learning

How can you leverage the place value understanding demonstrated in this lesson to support students in the next lesson as they plot decimals to the thousandths on number lines?

Unit 4
Lesson
5

Student devices recommended

We recommend students use devices for this lesson. **Student Edition pages** are also available.

The Claw

Locating Decimals on Number Lines

Let's locate and label decimals to the thousandths on number lines.

Lesson Goals

Today's Goals

1. **Goal:** Locate and label decimals to the thousandths on a number line.
2. **Language Goal:** Explain the placement of decimals on a number line. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use their place value understanding to locate and identify decimals to the thousandths on number lines with different scales. As they reason, students deepen their understanding of the relationship between decimal units and reflect upon the utility of different scales for different decimals. **(TEKS 5.1.E, 5.1.F)**

Prior Learning

In Lesson 4, students used place value understanding to represent decimals to the thousandths in different ways, focusing on the equivalence between standard form, expanded form, and expanded notation.

Future Learning

In Lesson 6, students will compare decimals using place value understanding and number lines. They will record the results of each comparison using >, <, or =.

Depth and Rigor of Student Thinking

- Students use number lines to build their **conceptual understanding** of the relationship between place values and to locate decimals to the thousandths.

Vocabulary

Review Vocabulary

hundredths

tenths

thousandths

TEKS

Building Toward

5.2.B

Compare and order two decimals to thousandths and represent comparison using the symbols >, <, or =.

Math Process Standards: 5.1.E, 5.1.F

ELPS: 1.E, 1.F, 2.B, 2.D, 2.E, 2.F

Building On

4.3.G

Building Math Identity

We are a math community.
Why is it important to listen to other mathematicians in your class?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.E, 5.1.F, Building Toward 5.2.B

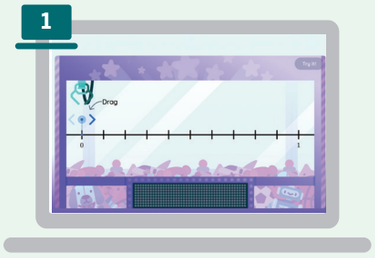
Why digital?

Students locate decimals to the thousandths on number lines and receive feedback on their precision.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about locating decimals on a number line.

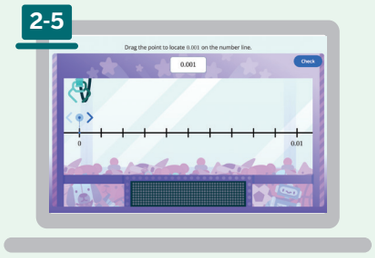


Activity 1

Pairs | 15 min

Students locate 0.001 on 3 number lines with different scales. They see that, depending on the scale of the number line, the location of 0.001 can be directly on a tick mark or estimated between tick marks.

Note: The Student Edition is not required for this activity.

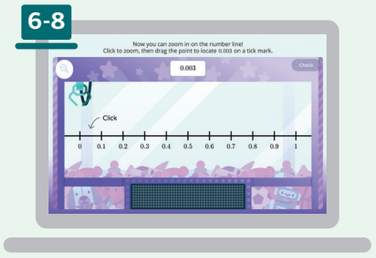


Activity 2

Pairs | 20 min

Students precisely locate and label decimals to the thousandths on number lines. They consider the place value of each decimal when locating it on a number line.

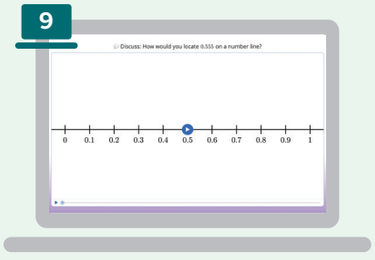
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on locating a decimal to the thousandths on a number line.

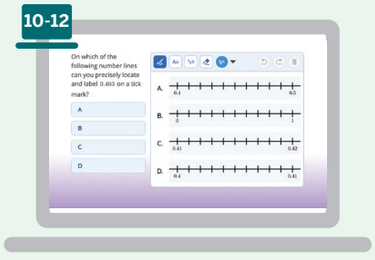


Show What You Know

Independent | 5 min

Students demonstrate their understanding by locating decimals to the thousandths on number lines.

Students using print: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

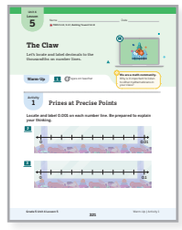
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

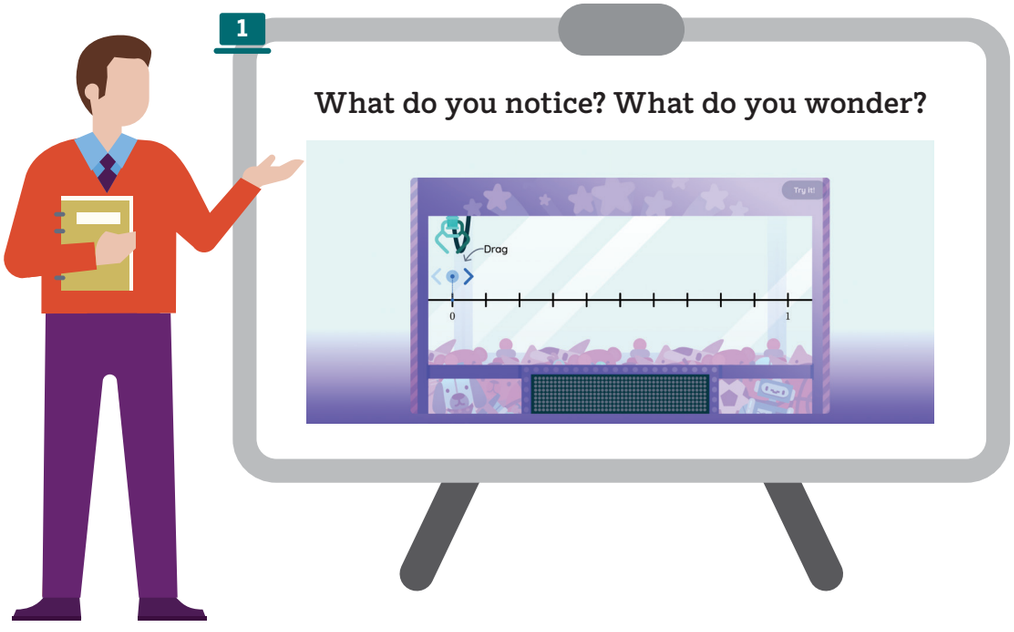
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students examine a number line partitioned into tenths and locate points at various tick marks to prepare for locating 0.001 on different number lines in Activity 1.

Students using print





1 Launch

1 **Display** the claw machine.

Say, "This claw machine picks up toys located at precise locations."

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

1 **Record** students' responses as they share.

Say, "You will use different number lines to locate prizes at different points."

Students using print: Have students demonstrate moving the point to different locations on the number line.

Students might say . . . ELPS 2.B

I notice that the number line is counting by tenths.

I notice that the toy was picked up at different points on the number line.

I wonder if the number line will always count by tenths.

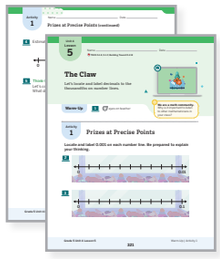
I wonder if any toys can be picked up between tick marks.

Pairs | 15 min | Suggested Pacing: Screens 2–4, Screen 5

Activity 1 Prizes at Precise Points

Purpose: Students locate 0.001 on 3 number lines with different scales. They consider how the scale impacts the location of a decimal.

Students using print



1 Launch

2 **Display** the number line and claw machine.

Say, "Work with your partner to complete Screens 2–4. Be prepared to explain your thinking."

2 Monitor

After students have completed **Screen 4**, refer to the **D Differentiation | Teacher Moves** table on the following page.

2-4 **If students need help getting started . . .**

- Ask, "How can you use what you did on Screen 1 to help you get started?"
- Ask, "What is this number line counting by? How do you know?"

3 Connect

5 **Display** the class's estimates for the location of 0.001.

Use the Think-Pair-Share routine. Invite students to discuss what they notice about the estimates for the location of 0.001.

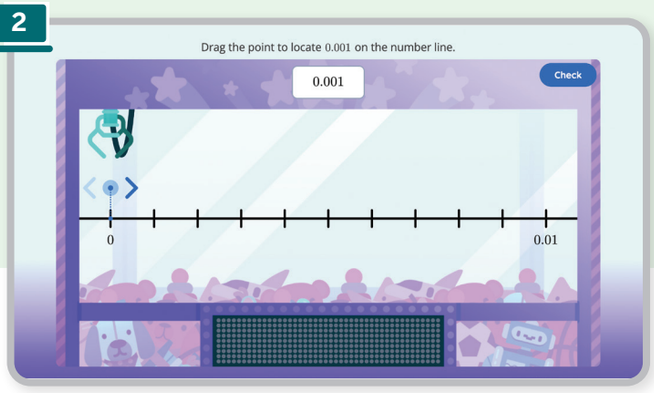
Ask (if not yet mentioned during discussion), "What was different about locating 0.001 on this number line compared to the number lines on Screens 2 and 3?"

EB **Emergent Bilinguals** Use wait time to allow students to formulate and rehearse a response before responding. **ELPS 1.E, 2.D, 2.F**

Key Takeaway: Say, "Depending on the scale of the number line, a decimal's location can be on a tick mark or estimated between tick marks."

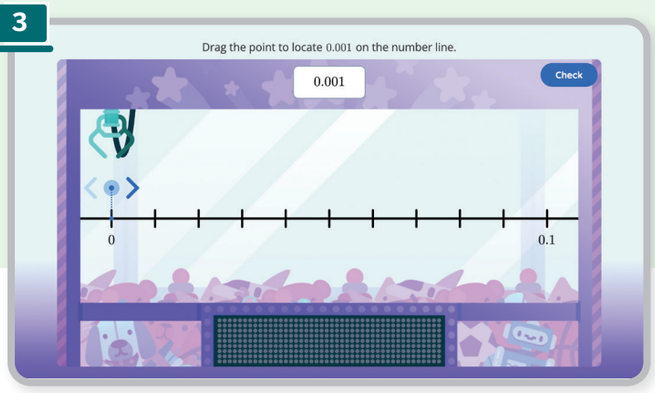
Students using digital

2



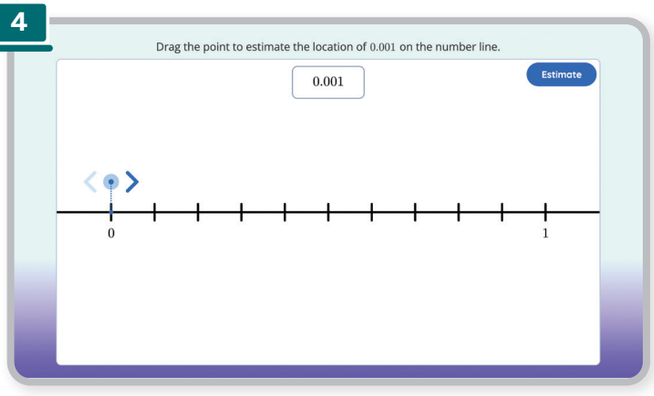
Students drag a point to locate 0.001 on a number line, placing it on the first tick mark after 0.

3



Students drag a point to locate 0.001 on a number line, placing it just after 0 on the number line.

4

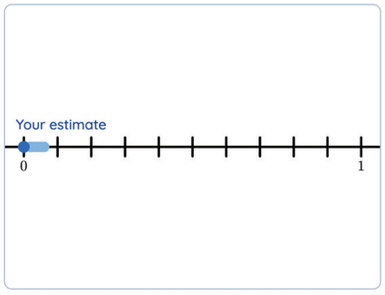


Students drag a point to estimate the location of 0.001 on a number line, placing it between 0 and the first tick mark.

5

Here are some estimates for where 0.001 is located on the number line.

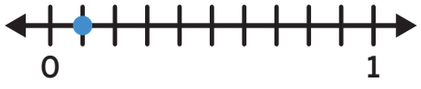
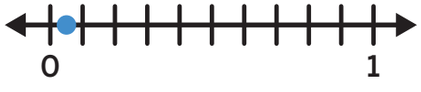
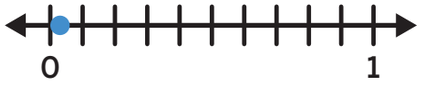
Think-Pair-Share
What do you notice about the estimates?



Students may notice that 0.001 is closer to 0 than the first tick mark.

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Estimate the location of 0.001 as the first tick mark.		**Support** Ask, "What is the number line counting by? How do you know? Can 0.001 be located on one of the tick marks?"
Estimate the location of 0.001 as about halfway between 0 and the first tick mark.		**Strengthen** Ask, "What is the value of the tick mark? Is 0.001 more or less than halfway between 0 and 0.1?"
Estimate the location of 0.001 as very close to 0.		**Stretch** Ask, "How would the number line need to change for you to more precisely locate 0.001?"

Pairs | 20 min | Suggested Pacing: Screens 6–8

Students using print

Activity 2 Bear Down

Purpose: Students use place value reasoning to locate decimals on number lines. They consider the scale of a number line and between which 2 numbers they can precisely locate a decimal.

1 Launch

6 **Demonstrate** the zoom in and zoom out feature.

Say, "Work with your partner to complete Screen 6."

Students using print: Students can pair with a partner on a device or look at the teacher's projection of Screen 6.

Invite pairs to share their strategies for Screen 6. Consider demonstrating students' strategies as they share.

Ask (if not yet mentioned during discussion), "How did you use this number line to precisely locate 0.003?"

Say, "Continue on to Screen 7 to try more claw machine challenges. Then complete Screen 8."

Students using print: Mirroring the challenges on Screen 7, students first choose the number line with the appropriate scale to plot each point. Then they locate and label the decimal. On Screen 8, students may draw or sketch on their Student Editions to record their thinking if it is helpful.

2 Monitor

After students have completed **Screen 8**, refer to the D **Differentiation | Teacher Moves** table on the following page.

7-8 **If students need help getting started . . .**

- Ask, "How can you use what you did on Screen 6 to help you get started?"
- Ask, "Between which 2 numbers should you zoom first? Why?"

Snapshot: Use Screen 8 as an opportunity to capture snapshots of students' thinking for sharing in the Connect.

3 Connect

8 Invite students to share their responses and strategies for Screen 8. Select and sequence their responses in the order shown in the *Differentiation* table.

A **Accessibility: Visual-spatial processing** Annotate the screen or sketches shared using students' responses and reasoning.

MLR **MLR8: Discussion Supports — Pressing for Details** ELPS 2.E

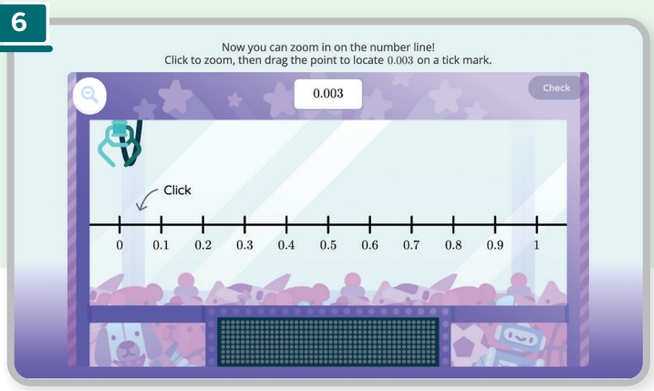
As students share who they agree with and their sketches, press for details in their reasoning. For example:

- If a student says, "I located 0.618 on the tick mark between 0.61 and 0.62, so it is between 0.61 and 0.62." . . .
- Press for details by asking, "How did you know which tick mark represented 0.618? How would you locate 0.618 on the number line between 0.6 and 0.7?"

Key Takeaway: Say, "To precisely locate and label a decimal on a number line, it is helpful if the scale of the number line is the place value of the decimal."

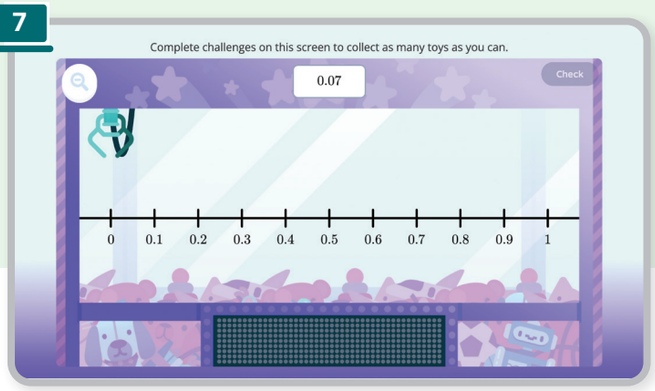
Students using digital

6



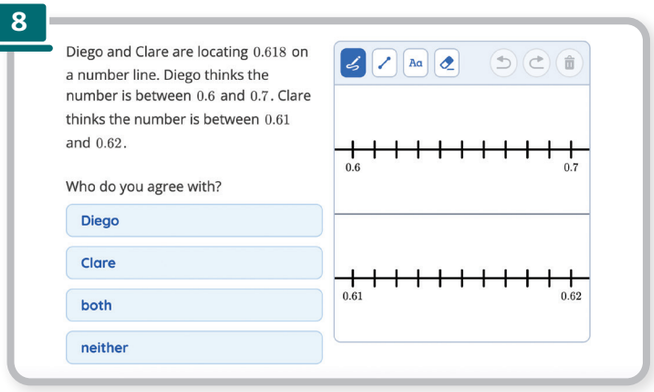
Students zoom in on a number line to precisely locate 0.003.

7



Students locate decimals to different place values on number lines, such as locating 0.07 between 0 and 0.1.

8



Students may explain that both Diego and Clare are right because 0.618 is between 0.6 and 0.7 and between 0.61 and 0.62.

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

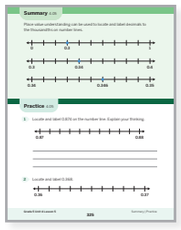
Look for students who . . .	For example . . .	Provide support . . .
Almost there Agree with neither.	**0.618 is not between any of the pairs.**	**Support** Ask, "If you renamed 0.6 and 0.7 as thousandths, what are they equal to? Does 0.618 fall between them? What about 0.61 and 0.62?"
Agree with Diego.	**0.618 is greater than 0.600 and less than 0.700, so it is between 0.6 and 0.7.**	**Strengthen** Ask, "Could 0.618 be located on a tick mark if between 0.6 and 0.7? Why or why not?"
Agree with Clare.	**To locate 0.618 on a tick mark, it has to be on a number line that is counting by thousandths, so it is between 0.61 and 0.62.**	**Strengthen** Ask, "On which tick mark would 0.618 be located if between 0.61 and 0.62? How do you know?"
Agree with both.	**0.618 is between both pairs of numbers because first I need to zoom in between 0.6 and 0.7 and then zoom again so I can locate 0.618 on a tick mark.**	**Stretch** Ask, "What are 3 other numbers that fall between both 0.6 and 0.7 and 0.61 and 0.62?"

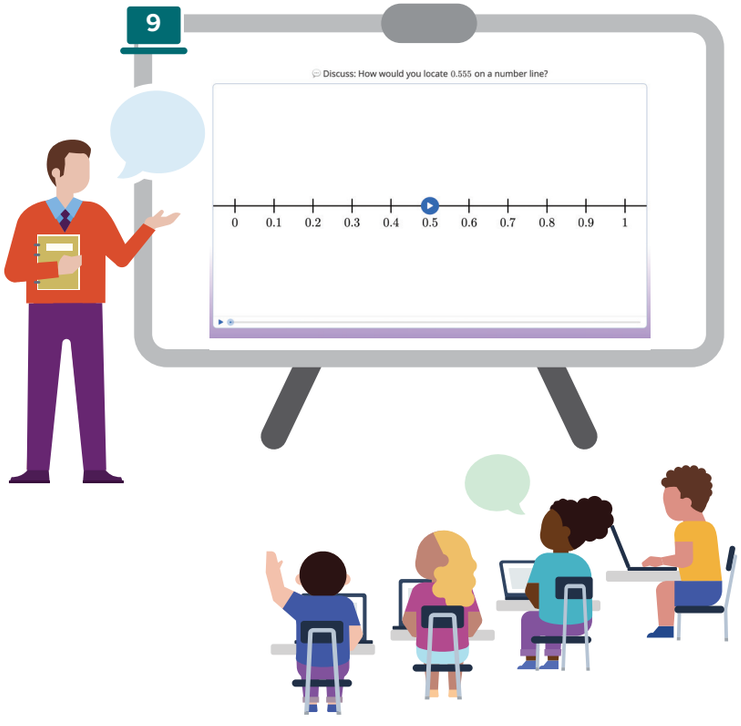
Whole Class | 10 min | Suggested Pacing: Screen 9

Synthesis

Lesson Takeaway: Decimals to the thousandths can be precisely located on number lines using place value understanding and the relationship between tenths, hundredths, and thousandths

Students using print





9 **Ask**, "How would you locate 0.555 on a number line?"

Record students' responses.

Play the animation. ELPS 1.F

Say, "You can use your understanding of place value to locate and label decimals to the thousandths on number lines."

Invite students to refer to the **Summary** during Practice or anytime during the year.

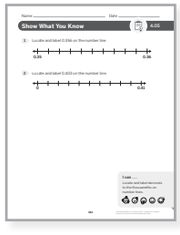
Show What You Know

Independent | 5 min |

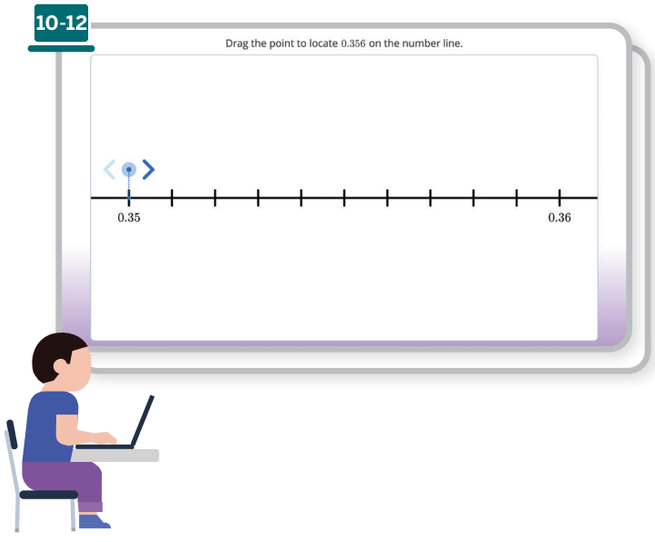
Suggested Pacing: Screens 10–12

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Locate and label decimals to the thousandths on a number line.
   - In Problems 1 and 2 in the *Show What You Know*, students located and labeled a decimal to the thousandths on a number line.
2. **Language Goal:** Explain the placement of decimals on a number line. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

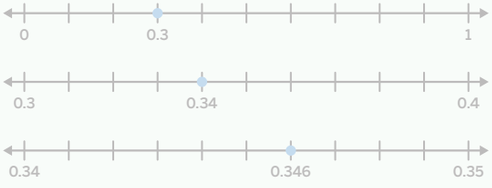
Lesson 5
Practice

Students using digital

Students using print

Summary 4.05

Place value understanding can be used to locate and label decimals to the thousandths on number lines.

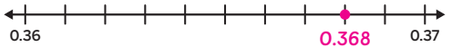


Practice 4.05

1 Locate and label 0.874 on the number line. Explain your thinking.
Sample explanation shown.

The tick marks represent thousandths.
0.874 is 4 tick marks to the right of 0.87 because it has 4 thousandths.

2 Locate and label 0.368.



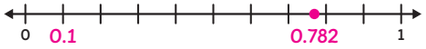
Grade 5 Unit 4 Lesson 5 325 Summary | Practice

Practice 4.05

Name _____ Date _____

For Problems 3–5, locate and label 0.782 on the number line.

3



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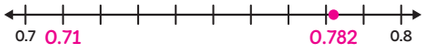

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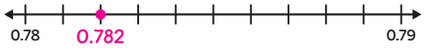
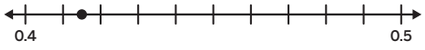


6 Which number could represent the point on the number line?



(A) 0.45
(B) 0.415
(C) 0.401
(D) 0.42

Grade 5 Unit 4 Lesson 5 326 Practice

Practice 4.05

Name _____ Date _____

Spiral Review

For Problems 7 and 8, determine the product using the standard algorithm.

Show your thinking.

7 146 × 23

$$\begin{array}{r} {\scriptstyle 1} \\ 1\,{\scriptstyle 1} \\ 1\,4\,6 \\ \times\quad 2\,3 \\ \hline 4\,3\,8 \\ +\ 2,9\,2\,0 \\ \hline 3,3\,5\,8 \end{array}$$

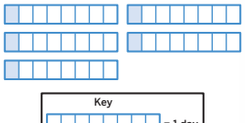
answer: 3,358

8 308 × 24

$$\begin{array}{r} {\scriptstyle 1\ 3} \\ 3\,0\,8 \\ \times\quad 2\,4 \\ \hline 1,2\,3\,2 \\ +\ 6,1\,6\,0 \\ \hline 7,3\,9\,2 \end{array}$$

answer: 7,392

9 Priya and her family spent $\frac{1}{8}$ of each of the 5 days of their vacation swimming at the lake. The model is shaded to represent the amount of time Priya and her family spent swimming.



Write an expression that represents the number of days Priya spent swimming with her family.

Record your answer in the space provided.
Sample response shown.

$5 \times \frac{1}{8}$

Grade 5 Unit 4 Lesson 5 327 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–6	2	5.2.B*
Spiral Review			
Fluency	7, 8	1	5.3.B
Test Practice	9	1	5.3.I

*These problems build toward the standard shown.

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 5

Lesson Goal: Locate and label decimals to the thousandths on a number line.

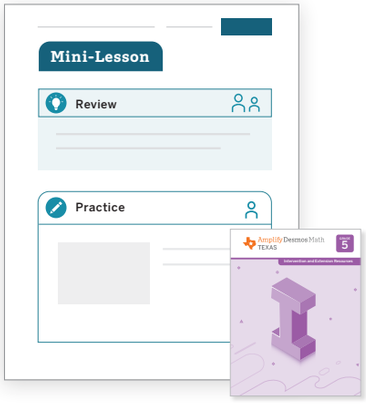
Support

Provide targeted intervention for students by using these resources.

If students identify an inaccurate location on both number lines:

Respond:

- Assign the *Locating Decimals on Number Lines* **Mini-Lesson.** | 15 min
- Invite students to discuss the connection between ordering whole numbers and ordering decimals with a partner.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students identify the accurate location of one of the two decimals:

Respond:

- Invite students to play these **Centers.** | 15 min
  Get Your Numbers in Order: Denominators 2, 3, 4, 5, 6, 8, 10, 12, or 100
  Greatest of Them All: Decimals to Hundredths
- Have students complete **Lesson 5 Practice.** | 15 min
- **Item Bank**

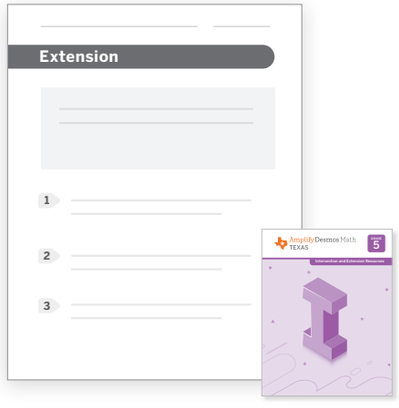
Stretch

Challenge students and extend their learning with these resources.

If students identify the accurate location of both decimals:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities.** | 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

What unfinished learning or misunderstandings do your students have about locating decimals on number lines? How did you leverage those misconceptions in a positive way to further the understanding of the class?

Unit 4
Lesson
6

Student Edition pages and Presentation Screens support learning in this lesson.

Selling Collectibles

Comparing Decimals to the Thousandths

Let's compare 2 decimals using place value and the symbol >, <, or =.

Key Concepts

Today's Goals

1. **Goal:** Compare 2 decimals to the thousandths place based on the values of the digits in each place, using the symbol >, <, or =.
2. **Language Goal:** Explain when a value is greater than or less than another value using place value reasoning. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E

Connections and Coherence

Students compare 2 decimals to the thousandths by applying their understanding of place value and previous strategies used to compare other numbers. They record the results of their comparisons using the symbol <, > or = or as an **inequality**. As students compare, they make sense of how the structure of the base-ten place value system extends to more decimal places and how the values of the digits in each place impact the relative size of a decimal number. **(TEKS 5.1.D, 5.1.F, 5.1.G)**

Prior Learning

In Grade 4, students compared and ordered decimals to the hundredths using concrete and visual models. In Lesson 5, students used number lines to locate decimals to the thousandths.

Future Learning

In Lesson 7, students will use place value understanding to round decimals to the nearest whole, tenth, and hundredth.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of comparing decimals to the thousandths with place value.

Vocabulary

New Vocabulary

inequality

Review Vocabulary

hundredths

tenths

thousandths

TEKS

Addressing

5.2.B

Compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =.

Math Process Standards: 5.1.D, 5.1.F, 5.1.G

ELPS: 1.A, 1.B, 1.C, 1.E, 2.B, 2.C, 2.D, 2.E, 3.B, 3.C, 3.D, 3.E, 3.F, 3.G, 4.A, 4.B

Building On	Building Toward
4.2.C	**6.2.C**
4.2.F	

Building Math Identity

I am a doer of math.

Why is it important not to compare yourself to other mathematicians?

Invite students to reflect on this question as they complete this lesson.

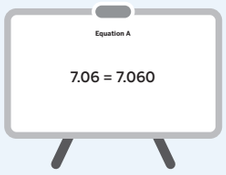
Lesson at a Glance 60 min

TEKS: 5.1.D, 5.1.F, 5.1.G, 5.2.B

Warm-Up Fluency

grouping | 10 min

Students use the **True or False?** routine, in which they determine whether a series of equations are true or false and justify their responses. They are introduced to the term **inequality**.



Activity 1

Pairs | 15 min

Students compare decimals to the thousandths with similar digits in different place values using a strategy of their choice, including number lines, equivalence, or place value understanding. They record their comparison statements as using the symbol >, <, or =.

Activity 2

Pairs | 20 min

Students are introduced to the Center *Greatest of Them All: Decimals*, in which they use the structure of place value to create the largest possible decimal to the thousandths. They write comparison statements using the symbol >, <, or = to compare their decimals.

Manipulative Kit: Number cards (0–9)

Synthesis

Whole Class | 10 min

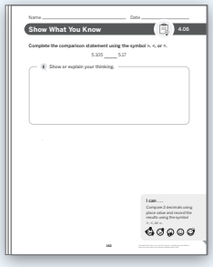
Students review and reflect on whether a comparison statement is true using place value understanding.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by using place value to compare 2 decimals to the thousandths and use >, <, or = to record the results of their comparisons.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Frayer model
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F

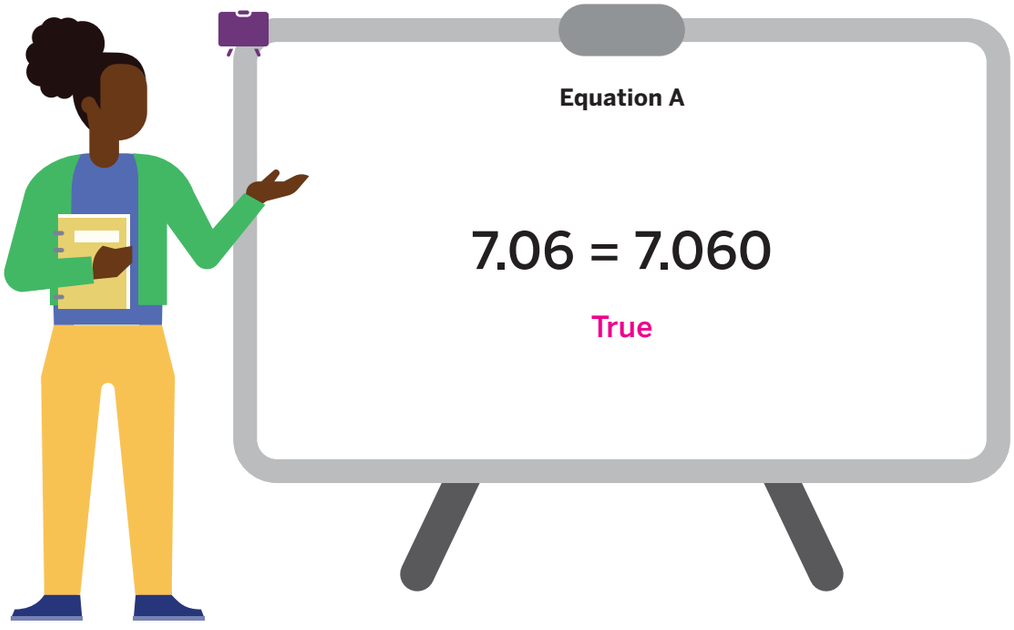
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screens

Warm-Up True or False? Fluency

Purpose: Students use place value reasoning to determine whether 4 equations involving similar digits to the thousandths are true, preparing them to compare 2 decimals to the thousandths.



Equation B

7.06 = 7.600

False

Equation C

7.6 = 7.60

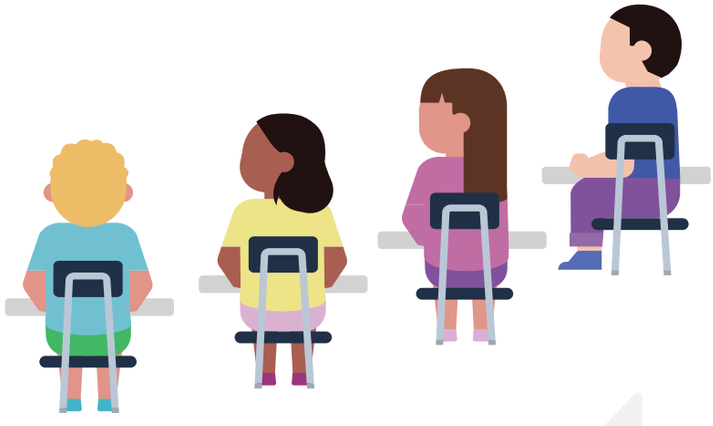
True

Equation D

7.006 = 7.060

False

Why these problems? These equations lend themselves to writing a given decimal in a different form to compare it to another decimal with more place values.



1 Launch

Use the True or False? routine.

Display 1 equation at a time.

Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

Record 2 or 3 students' responses, asking for their reasoning and allowing others to agree or disagree. Keep each equation displayed as you progress to the next.

Repeat with each equation.

Ask, "How did you use place value to reason about each equation?"

Say, "When two numbers are not equal and one can be described as greater than or less than the other number, the comparison is called an **inequality**. Inequalities can be represented with the symbols < and >."

Students might say . . . ELPS 2.B, 2.C, 2.D, 2.E

A: *True. Both have 7 ones, 0 tenths, 6 hundredths, and 0 thousandths.*

B: *False. There are different digits in the tenths. 0 tenths is less than 6 tenths.*

C: *True. 7.6 is equivalent to 7.60.*

D: *False. 7.006 is less than 7.060 because 6 hundredths is greater than 0 hundredths.*

Pairs | 15 min

Presentation Screens

Activity 1 Collectible Miniatures

Purpose: Students use place value reasoning to compare decimals to the thousandths and write comparison statements using <, >, or =. They consider how different strategies show place value understanding.

1 Launch

Read aloud the introduction and directions.

Say, "You will complete Problems 1–4 with your partner. Then you will join another pair to complete Problem 5."

A **Accessibility: Executive functioning** Have partners take turns making observations about the weights listed in the table and brainstorming possible strategies for making comparisons.

EB **Emergent Bilinguals:** To support students as they make sense of the context of 3D-printing collectible miniatures, provide images of small 3D-printed figurines. ELPS 3.D, 3.F

2 Monitor

After students have completed **Problem 4**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What 2 numbers are you comparing?"
- Ask, "If these were whole numbers, how would you compare them? How can that help you compare 2 decimals?"

3 Connect

Invite students to share their reasoning for why 5.009 is less than 5.1 in Problem 4 and how they recorded their comparison statement using symbols.

Record students' responses as they share.

MLR **MLR3: Critique, Correct, Clarify** ELPS 2.B, 2.D, 2.E, 3.E, 3.G

Display the following incorrect statement for Problem 4: "5.009 > 5.1 because 5.009 has more digits, so it is greater." Ask:

- *Critique*: "What might this student be trying to say? How do you know?"
- *Correct*: "What could you add or change to make their statement true?"
- *Clarify*: "What could you add or change to make their statement easier to understand?"

Key Takeaway: Say, "Just like with whole numbers, you can compare decimals using place value reasoning and you can record the comparison using symbols."

Unit 4 Lesson 6

Name _____ Date _____

TEKS 5.1.D, 5.1.F, 5.1.G, 5.2.B

Selling Collectibles

Let's compare 2 decimals using place value and the symbol <, >, or =.

Warm-Up eyes on teacher

I am a doer of math.
Why is it important not to compare yourself to other mathematicians?

Activity 1

Collectible Miniatures

Kara creates miniatures of different dog breeds using her 3D printer. The size of the miniature determines the weight of materials needed to make that miniature.

Miniature	toy poodle	French bulldog	pug	Chihuahua	corgi	terrier	dachshund
Weight (ounces)	5.01	5.1	5.010	5.009	5.02	5.012	5.021

Write a comparison statement about the weights of the 2 dogs using <, >, or =. Sample work shown.

Show or explain your thinking.

1 the Chihuahua and the terrier

answer: 5.009 < 5.012 or 5.012 > 5.009

Activity 1

Name _____ Date _____

Collectible Miniatures (continued)

Show or explain your thinking.

2 the corgi and the dachshund

5.021 and 5.02 have the same number of ones, tenths, and hundredths, but 5.201 also has 1 thousandth, so it is greater.

answer: 5.021 > 5.02 or 5.02 < 5.021

3 the toy poodle and the pug

toy poodle: $5.01 = 5\frac{1}{100}$, pug: $5.010 = 5\frac{10}{1{,}000}$

$\frac{1}{100} = \frac{10}{1{,}000}$

answer: 5.01 = 5.010

4 the Chihuahua and the French bulldog

Chihuahua: 5.009, French bulldog: 5.100
Both weights have 5 whole pounds. 5.1 has 1 in the tenths place, and 5.009 has 0 in the tenths place, so 5.1 is greater.

answer: 5.009 < 5.1 or 5.1 > 5.009

5 Discuss

Join another pair. Discuss how you compared the weights in Problems 1–4. How are your strategies similar? How are they different?

Oral activity: No writing expected. Answers may vary but students should recognize that each strategy shows an understanding of place value.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Use a number line to compare.		**S Strengthen** Ask, "What thinking did you use to label your number line? How could you use that thinking to compare the decimals without drawing a number line?"
Write equivalent decimals or mixed numbers to the thousandths with numbers or words.	5.1 = 5.100, and 100 thousandths is greater than 9 thousandths. or $5.1 = 5\frac{1}{10} = 5\frac{100}{1{,}000}$ $5.009 = 5\frac{9}{1{,}000}$ $5\frac{100}{1{,}000} > 5\frac{9}{1{,}000}$, so $5.1 > 5.009$	**S Strengthen** Ask, "How would you compare the decimals if the value of the digit in the ones place was not the same? Why?"
Use place value reasoning to compare the digits of each place value, starting with the greatest place value and stopping when the digits are different.	Both weights have 5 whole pounds. 5.1 has 1 in the tenths place, and 5.009 has 0 in the tenths place, so 5.1 is greater.	**S Stretch** Ask, "Would this strategy work every time you compare 2 decimals? Why or why not?"

Pairs | 20 min

Activity 2 Introducing the Center Greatest of Them All, Decimals

Purpose: Students play a game to practice comparing decimals to the thousandths and recording comparison statements.

Presentation Screens

Materials

Manipulative Kit:

- Distribute one set of number cards (0–9) to each pair.

Short on time? Consider having students complete only a few rounds of the game.

1 Launch

Note: In order for students to have the opportunity to compare decimal numbers with the same digits, have students put their cards back in the pile and shuffle after they record their numbers.

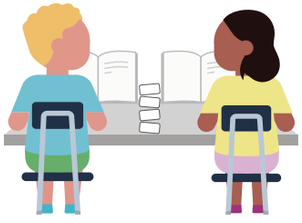
Read aloud the Directions, emphasizing that the goal of the game is to make a final value that is greater than their partner's value. ELPS 1.E

Demonstrate how to play the game by choosing 4 cards, one at a time. Record the number, put the cards back in the pile, and shuffle. ELPS 1.C

Ask (after each card is selected):

- "Where would you place this digit? Why?"
- "Could my partner win this round in 1 move? How?"

2 Monitor



Use the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What number cards would be best to place in the smaller place values? In the larger place values? Why?"

3 Connect

Invite students to share how they would finish the round. Then have students compare the numbers.

Record students' responses with 2 comparison statements showing the comparison symbol correctly being used in 2 directions. For example, $1.078 < 1.708$ and $1.708 > 1.078$.

Key Takeaway: Say, "You can represent an inequality in more than one way using the symbols < and >."

Student Edition

Activity 2

Name _____ Date _____

Introducing the Center, Greatest of Them All Decimals

Pairs Let's make and compare decimal numbers.
You'll need: Number Cards, 0–9, Recording Sheet, one per pair.

Set Up

- Choose who will be Player A and who will be Player B.
- Shuffle the Number Cards and place them in a stack facedown.

How to Play

1. Each player draws a Number Card and records it in one of the boxes.
2. Repeat until each player has a number to the thousandths place.
3. Write a comparison using <, >, or =. The player with the greater number earns 1 point.

How to Win When the Recording Sheet is full, the player who earns more points wins.

CENTER Recording Sheet

Name _____ Date _____

Greatest of Them All (continued)

Player A	Compare using <, >, or =	Player B	Winner?

Presentation Screens

D Differentiation | Teacher Moves

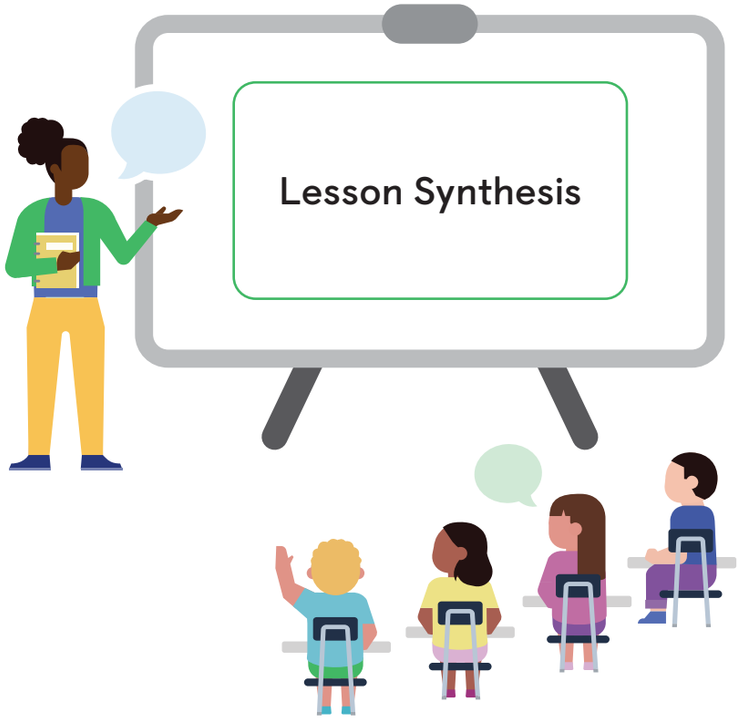
Look for students who . . .	For example . . .	Provide support . . .
Almost there Compare some of the digits in each number.	6.280 and 6.284 8 is smaller than 84.	**Support** Ask, "What does 8 represent? What does 64 represent?"
Compare the total number of thousandths.	6.280 and 6.284 6.280 is 6 wholes and 280 thousandths. 6.284 is 6 wholes and 284 thousandths. 284 > 280, so 6.280 < 6.284	**Strengthen** Ask, "What do you notice about the numbers? How could you compare the individual place values to determine which value is greater?"
Compare the greatest place value that has different digits.	6.280 and 6.284 The thousandths is the only place value with different digits. 0.004 > 0, so 6.280 < 6.284	**Strengthen** Ask, "What would you do if all the place values had different digits?"

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Two decimals can be compared and the comparisons can be represented with numbers and symbols. **Inequalities** can be represented with symbols in more than 1 way.



Ask:

- "Is this comparison statement true? Why or why not?"
- "How could you change one of the numbers to make this comparison statement true?"

Record students' responses as they share.

Say, "When comparing 2 decimals, it is important to pay attention to the place value of each digit. This may require you to use equivalent values so that both values are extended to the same decimal place value. A comparison of two numbers that are equal can be represented using the symbol =. Inequalities can be represented using the symbols < and > in more than 1 way."

Formalize vocabulary: An **inequality** is the relationship between two numbers in which one number is greater or less than the other number. Inequalities can be represented with the symbols < and >. (optional)

Consider using the Word Structure: Word History routine with the word **inequality**

Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support. Distribute pre-cut cards for this term from the Vocabulary Cards, Unit 4 PDF from the *Math Language Development Resources*. Consider asking, "The term *inequality* comes from the Latin word *inaequalis*, which means not equal. How can you use this Latin word to help you understand the term *inequality*?"

ELPS 1.A, 1.B, 3.B, 3.C, 4.A, 4.B

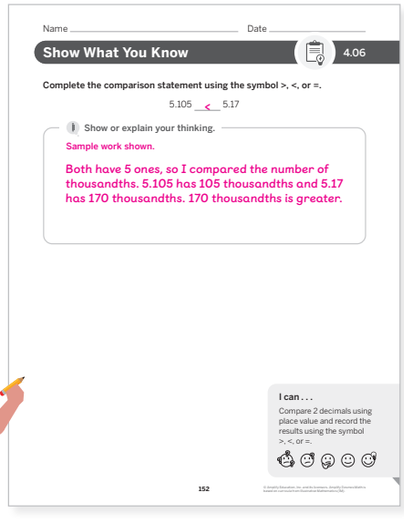
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.06

Complete the comparison statement using the symbol >, <, or =.

5.105 __<__ 5.17

Show or explain your thinking.

Sample work shown.

Both have 5 ones, so I compared the number of thousandths. 5.105 has 105 thousandths and 5.17 has 170 thousandths. 170 thousandths is greater.

I can . . .

Compare 2 decimals using place value and record the results using the symbol >, <, or =.

152

Today's Goals

1. **Goal:** Compare 2 decimals to the thousandths place based on the values of the digits in each place, using the symbol >, <, or =.
   - In the *Show What You Know*, students compared 2 decimals using the symbol >, <, or =.
2. **Language Goal:** Explain when a value is greater than or less than another value using place value reasoning. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E
   - In the *Show What You Know*, students explained their thinking when comparing 2 decimals using the symbol >, <, or =.

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 6
Practice

Students using digital

Students using print

Summary 4.06

Comparing decimal numbers is similar to comparing whole numbers because you compare the digits using an understanding of place value or equivalence. You can use <, >, or = to record comparison statements. When a comparison statement shows that the numbers are not equal, it is an inequality.

0.43 > 0.403 ← inequality

Place value	0.43 0.403 The digit in the tenths place is the same, so the hundredths place will determine the comparison. 3 hundredths > 0 hundredths, so, 0.43 > 0.403.
Decimal equivalence	0.43 is the same as 0.430, so 0.430 > 0.403.
Fraction equivalence	$\frac{43}{100} = \frac{430}{1,000}$, so $\frac{430}{1,000} > \frac{403}{1,000}$

inequality The name of a statement used to express the relationship between 2 unequal numbers, in which < or > symbols are used.

Practice 4.06

For Problems 1–4, write a comparison statement about the 2 decimals using <, >, or =.

1 0.654 and 0.658 Sample work shown.

Show your thinking.

0.658 is greater than 0.654 because it is farther to the right on the number line.

answer: 0.654 < 0.658 or 0.658 > 0.654

Practice 4.06

Name _____ Date _____

2 0.009 and 0.008 Sample work shown.

Show your thinking.

0.009 is closer to 0.01 on the number line, so it is greater than 0.008.

answer: 0.009 > 0.008 or 0.008 < 0.009

3 0.601 and 0.61 Sample work shown.

Show or explain your thinking.

$0.601 = \frac{601}{1,000}$

$0.61 = \frac{61}{100} = \frac{610}{1,000}$

answer: 0.61 > 0.601 or 0.601 < 0.61

4 1.85 and 1.849 Sample work shown.

Show or explain your thinking.

The digits 1 and 8 are the same, so I compared the digits in the hundredths place. 5 > 4

answer: 1.85 > 1.849 or 1.849 < 1.85

Practice 4.06

Name _____ Date _____

The table shows the length of insects that Priya found. Use the table for Problems 5 and 6.

Insect	Length (in.)
ant	0.75
beetle	0.835
cricket	0.705
grasshopper	0.955

5 Which insect has the *longest* length?

(A) ant (B) beetle (C) cricket (D) grasshopper

6 Which comparison statements are true?

Select **THREE** correct answers.

Comparison statement
○ 0.835 > 0.955
● 0.705 < 0.75
● 0.955 > 0.75
● 0.75 < 0.835
○ 0.835 < 0.705
○ 0.955 < 0.705

Spiral Review

Determine the quotient using the standard algorithm.

7 5,952 ÷ 16

$$\begin{array}{r} 372 \\ 16\overline{)5952} \\ -48\downarrow \\ \hline 115 \\ -112\downarrow \\ \hline 32 \\ -\ 32 \\ \hline 0 \end{array}$$

answer: 372

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–4	2	5.2.B
	5	1	5.2.B
Test Practice	6	2	5.2.B
Spiral Review			
Fluency	7	1	5.3.C

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 6

Lesson Goal: Compare 2 decimals to the thousandths place based on the values of the digits in each place, using the symbol >, <, or =.

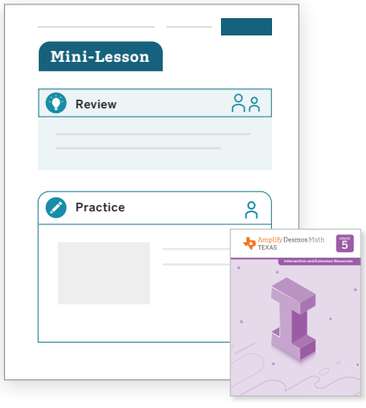
Support

Provide targeted intervention for students by using these resources.

If students compare some of the digits in each number:

Respond:

- Assign the *Comparing Decimals to the Thousandths* **Mini-Lesson.** | 15 min
- Invite students to discuss the value of the thousandths and how that can inform their comparisons with a partner.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students use equivalence or place value reasoning to compare 2 decimals:

Respond:

- Invite students to play these **Centers.** | 15 min
  Get Your Numbers in Order: Decimals
  Greatest of Them All:
  - *Decimals to Hundredths*
  - *Decimals*

  Mystery Number: Decimals
- Have students complete **Lesson 6 Practice.** | 15 min
- **Item Bank**

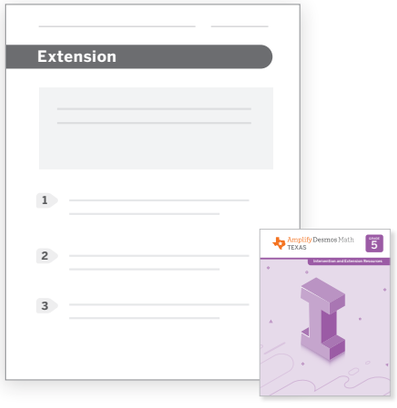
Stretch

Challenge students and extend their learning with these resources.

If students explain when a value is greater than or less than using place value reasoning:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities.** | 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

In what ways did your students apply place value reasoning from previous lessons during today's lesson?

Unit 4
Lesson
7

Student devices recommended

We recommend students use devices for this lesson. **Student Edition pages** are also available.

Which Way Down the Mountain?

Rounding Decimals to the Hundredths

Let's round decimals to the nearest whole, tenth, and hundredth.

Key Concepts

Today's Goals

1. **Goal:** Round decimals to the nearest whole number, tenth, and hundredth.
2. **Language Goal:** Explain how to round decimals with or without number lines. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students round decimals to the nearest whole number, tenth, and hundredth, selecting tools and techniques that make sense to them. They discuss their rounding strategies using their conceptual understanding of number lines and procedural fluency with place value. Students see that the same strategies for rounding whole numbers can be applied to rounding decimals. **(TEKS 5.1.C, 5.1.D, 5.1.F)**

Prior Learning

In Grade 4, students rounded whole numbers to a given place value through the hundred thousand place. They applied the convention of rounding to the nearest 10, 100, or 1,000 to estimate solutions involving whole numbers.

Future Learning

In Lesson 8, students will apply rounding to different contexts, identify possible original values of numbers rounded to certain place values, and consider situations where rounding may change the order of results.

Depth and Rigor of Student Thinking

- Students continue to build their **conceptual understanding** of rounding, using their understanding of place value and relative distance to round to different place values.
- Students develop **procedural skills** for rounding decimals to the nearest whole number, tenth, and hundredth.

Vocabulary

Review Vocabulary

rounding

TEKS

Addressing

5.2.C

Round decimals to tenths or hundredths.

Math Process Standards: 5.1.C, 5.1.D, 5.1.F

ELPS: 1.E, 2.B, 2.C, 2.E, 2.F, 3.C, 3.D, 3.E, 3.F

Building On

4.2.D

4.4.G

Building Math Identity

I am a doer of math.

What is a math skill that took a lot of practice for you to improve? How did it feel when you improved?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.C, 5.1.D, 5.1.F, 5.2.C

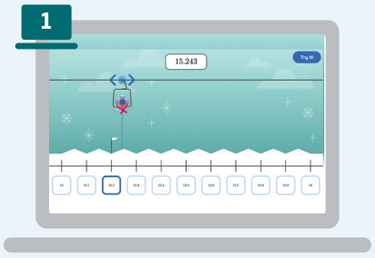
Why digital?

Students round decimals to any place with or without using number lines and receive feedback in real time.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about the nearest tenth a decimal is closest to when using a number line to round. This prepares them to use place value to determine which whole number, tenth, or hundredth a decimal rounds to in Activity 1.



Activity 1

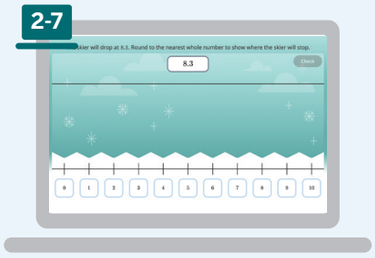
Pairs | 20 min

Students round decimals to the thousandths to the nearest whole number, tenth, or hundredth using number lines. They discuss what they have to consider when rounding decimals to any place value.

Note: The Student Edition is not required for this activity.

Materials: chart paper, markers, *Rounding Process* chart (teacher made)

Additional Prep Prepare: blank chart titled *Rounding Process*



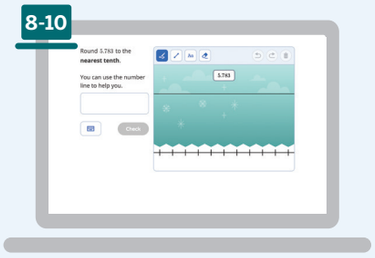
Activity 2

Pairs | 15 min

Students build on their work in Activity 1 to round decimals to any place with or without a number line. They connect their reasoning of rounding with whole numbers to rounding decimals.

Note: The Student Edition is not required for this activity.

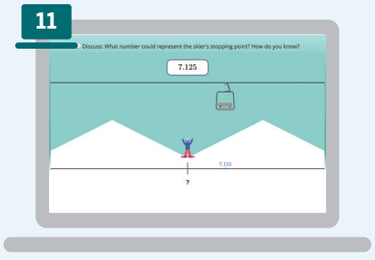
Materials: *Rounding Process* chart (from Activity 1)
Students using print: Activity 2 PDF (optional)



Synthesis

Whole Class | 10 min

Students review and reflect on how rounding a decimal to the nearest whole number, tenth, and hundredth can result in different values.

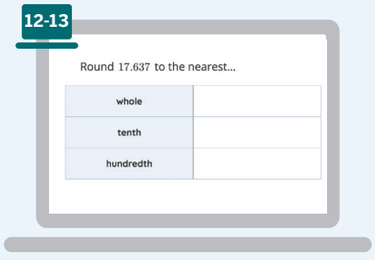


Show What You Know

Independent | 5 min

Students demonstrate their understanding by rounding a decimal to the nearest whole number, tenth, and hundredth.

Students using print: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

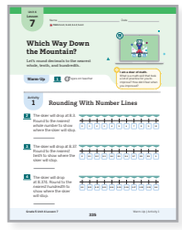
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

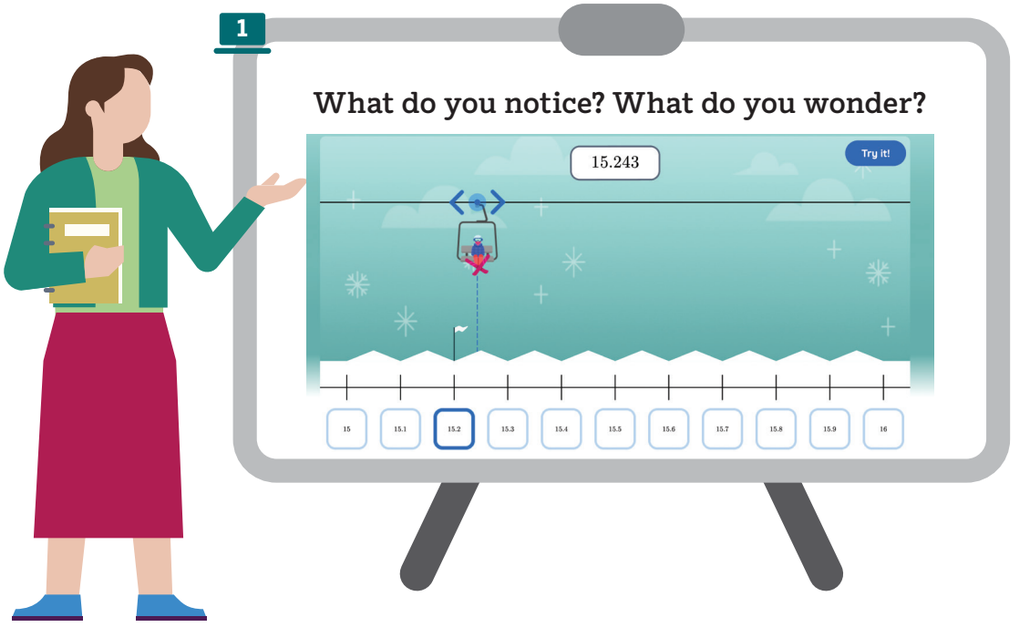
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students examine where a skier stops after dropping down at a specific location represented by a decimal, preparing them to round to the nearest whole number, tenth, and hundredth in Activity 1.

Students using print





1 Launch

1 **Display** the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

Students using print: Have students choose a specific location to drop the skier.

2 Connect

1 **Record** students' responses as they share.

Ask, "How can you determine which side of the mountain the skier will drop down on?"

Students might say . . . ELPS 2.B

I notice that the number line is labeled in tenths between 15 and 16.

I notice that the skier will drop on a mountain between 2 tenths and stop at one of the tenths.

I wonder if the skier is trying to get to the flag.

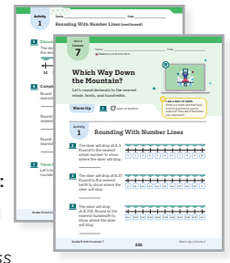
I wonder what happens if the skier drops exactly in the middle of the mountain.

Pairs | 20 min | Suggested Pacing: Screens 2-7

Activity 1 Rounding With Number Lines

Purpose: Students use number lines to round decimals to the nearest whole number, tenth, or hundredth. They recognize that they need to consider the place value they are rounding to and the 2 numbers the decimal falls between.

Students using print



Additional Print Materials

Classroom materials:

- Use chart paper and markers to prepare the *Rounding Process* chart before the lesson. Add to the chart during the Monitor.
- Display the *Rounding Process* chart during the Connect.

1 Launch

2 **Say**, "Complete Screens 2–6 with your partner."

2 Monitor

While students complete **Screen 5**, refer to the **D Differentiation | Teacher Moves** table on the following page.

2-6 **If students need help getting started . . .**

- Ask, "Between which 2 whole numbers is 8.3 located?"
- Ask, "Which whole number is it closest to? How do you know?"

MLR **MLR2: Collect and Display** **ELPS 3.C, 3.D, 3.E, 3.F**

- Collect students' language used to describe the process of rounding on the *Rounding Process* chart. For example, "To round 14.672 to the nearest tenth, I thought about what 2 tenths 14.672 is between — 14.6 and 14.7. 14.672 is located 7 hundredths away from 14.6 but only 3 hundredths away from 14.7, so I rounded to 14.7."
- Add the language students use to the class display and remind them to continue to refer to and use the display during class discussions.

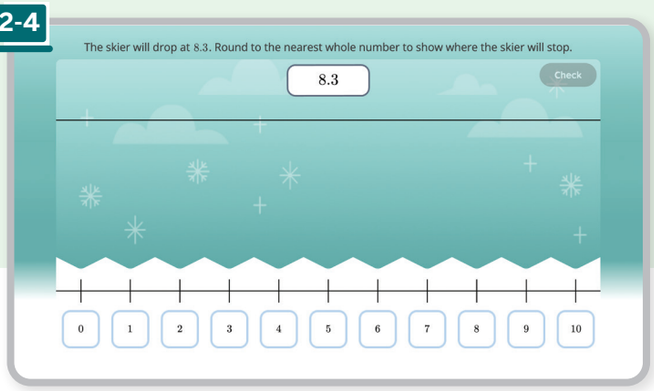
3 Connect

7 **Use the Think-Pair-Share routine**. Ask, "What do you have to consider when rounding decimals?"

Key Takeaway: Say, "When rounding decimals, you must first determine which place value you are rounding to. Then determine which two numbers the decimal is located between. Finally, determine the number that is exactly halfway between those two numbers. If the number you are rounding is halfway between the numbers or more than halfway between the numbers, you will round up. Otherwise, you will round down."

Students using digital

2-4

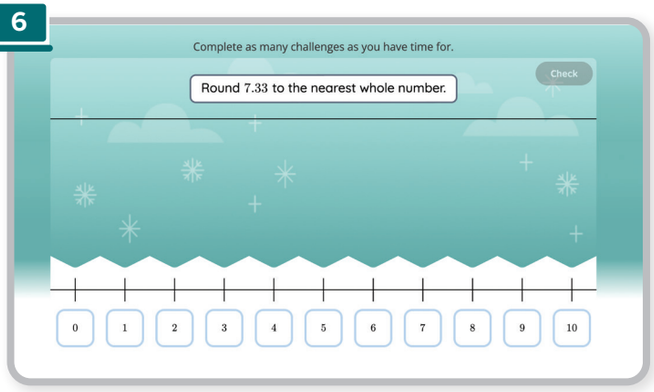


Students determine the nearest whole number, tenth, or hundredth for the numbers 8.3, 8.37, and 8.374, respectively.

5

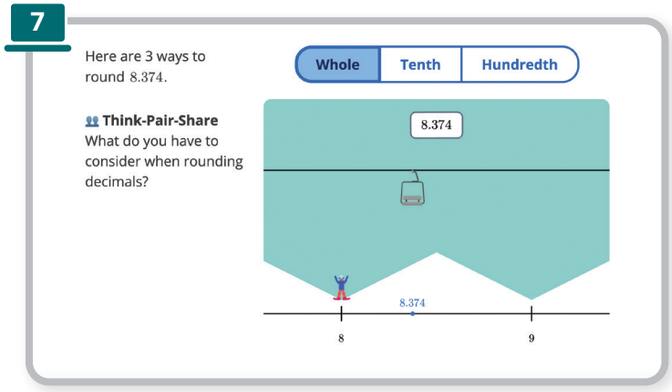
Students may explain that 14.672 can be rounded to the nearest tenth by noticing that 14.67 is only 3 hundredths away from 14.7 but 6 hundredths away from 14.6.

6



Students round different decimals to the nearest whole number, tenth, and hundredth, such as 7.33 rounds to 7 and 14.26 rounds to 14.3.

7



Students compare rounding 8.374 to the nearest whole, tenth, and hundredth. They may explain that it is helpful to consider the distance from the nearest place value, such as 8.374 being closer to 8.37 than 8.38.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Use the final digit in the number.	*There is a 2 in the last place value of 14.672, so the number should round down to 14.6.*	**Support** Ask, "What 2 tenths is 14.672 located between? How do you know which tenth it is closer to?"
Use the number of hundredths.	*There is a 7 in the hundredths place, so the number should round up to 14.7.*	**Strengthen** Ask, "Why does having a 7 in the hundredths place determine that you round up to 14.7?"
Use the distance from the 2 nearest tenths that the number is located between.	*14.672 is 7 hundredths away from 14.6 but only 3 hundredths away from 14.7.*	**Stretch** Ask, "Does this strategy work for rounding the same decimal to any place? How do you know?"

Pairs | 15 min | Suggested Pacing: Screens 8–10

Activity 2 Rounding Decimals

Purpose: Students round decimals to any place using a strategy of their choosing. They make connections between rounding whole numbers and rounding decimals.

Students using print

Additional Print Materials

Classroom materials:

- Display the *Rounding Process* chart (from Activity 1).

Lesson resources:

- Provide access to the Activity 2 PDF (optional).

1 Launch

8 **Say**, "Complete Screens 8–10 with your partner."

A **Students using print: Accessibility: Memory and attention** Provide access to blank number lines for students to use as they complete Screens 8–10.

2 Monitor

While students complete **Screen 10**, refer to the D **Differentiation | Teacher Moves** table on the following page.

8-9 **If students need help getting started . . .**

- Ask, "Which place value are you rounding to? How does that help you get started?"
- Ask, "Which 2 tenths does the number 5.783 fall between?"

3 Connect

10 **Invite students to share** their responses to Screen 10.

Record students' responses as they share.

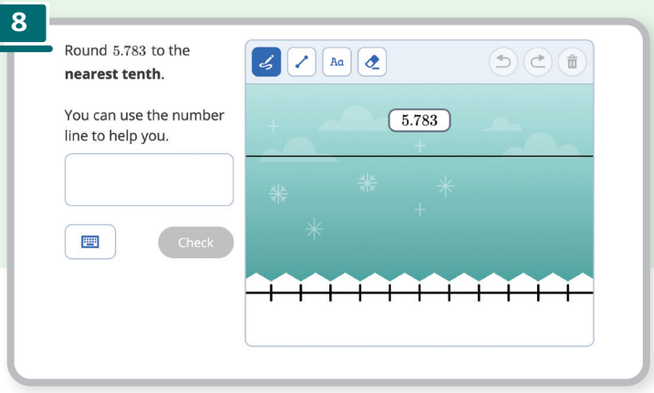
Ask, "How are these strategies similar to the strategies you used when rounding whole numbers? How are they different?"

EB **Emergent Bilinguals:** Provide students with sentence frames to help them formulate answers to Screen 10. For example, "To round to the nearest tenth, I would think about . . ." and "To round to the nearest hundredth, I would draw a number line and think about . . ." ELPS 1.E, 2.C, 2.E

Key Takeaway: Say, "You can use the same strategies you used to round whole numbers to round decimals to any place value. Tools such as number lines, can help you represent the numbers and determine how close the number is to the nearest tenth or hundredth."

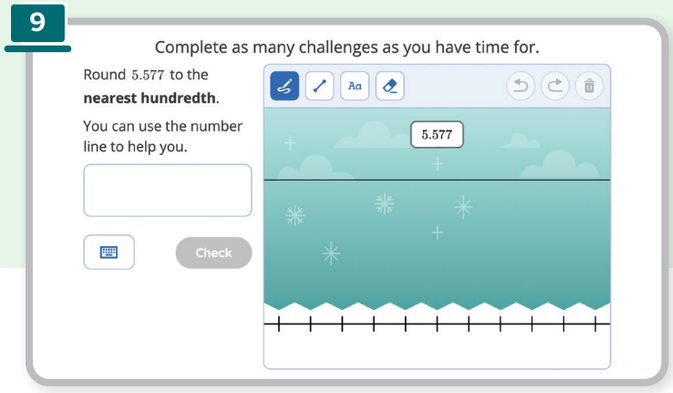
Students using digital

8



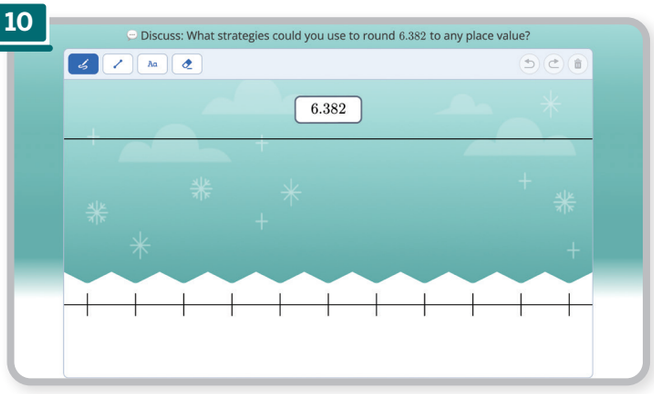
Students round 5.783 to the nearest tenth.

9



Students round decimals to the nearest whole, tenth, and hundredth, such as 5.577 rounds to 5.58 and 35.708 rounds to 35.7.

10



Students may explain that to round 6.382 to any place they can consider the rounding convention, rounding up when a digit is 5 or greater.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

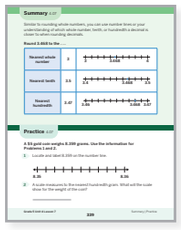
Look for students who . . .	For example . . .	Provide support . . .
Use a number line.	I could make a number line with the place value I am rounding to and determine which tick mark it is closest to.	**Strengthen** Ask, "How could you round this number without using a number line?"
Use relative distance.	If rounding to the nearest hundredth, I can determine what 2 hundredths the number is located between and round it to the closest hundredth.	**Stretch** Ask, "How could you explain how to round *any* number to *any* place value?"
Use place value understanding and the rounding convention.	I can look at the digit to the right of the place value I am rounding to. If the digit is 5 or greater, I round up, and if it is less than 5, I round down.	

Whole Class | 10 min | Suggested Pacing: Screen 11

Synthesis

Lesson Takeaway: The same rounding strategies and conventions used to round whole numbers to any place can be used to round decimals to any place.

Students using print



11 **Display** the Synthesis screen.

Ask, "What different numbers could represent the skier's stopping point? How do you know?"

Say, "Just like when rounding whole numbers, when rounding decimals, the rounded value may change depending on the place value you are rounding to."

Invite students to refer to the **Summary** during Practice or anytime during the year.

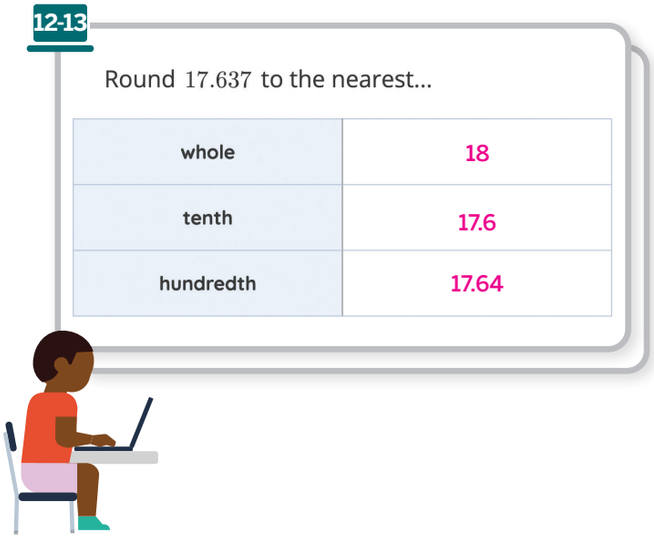
Show What You Know

Independent | 5 min |
Suggested Pacing: Screens 12–13

Students using print

(Show What You Know PDF)

Students using digital



Today's Goals

1. **Goal:** Round decimals to the nearest whole number, tenth, and hundredth.
   - In Problems 1–3 in the *Show What You Know*, students rounded a number to the nearest whole number, tenth, and hundredth.
2. **Language Goal:** Explain how to round decimals with or without number lines. **(Listening and Speaking)**
   ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 7
Practice

Students using digital

Students using print

Summary 4.07

Similar to rounding whole numbers, you can use number lines or your understanding of which whole number, tenth, or hundredth a decimal is closer to when rounding decimals.

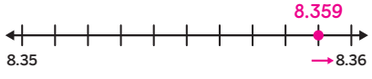
Round 3.468 to the . . .

Nearest whole number	3	3 — 3.468 — 4
Nearest tenth	3.5	3.4 — 3.468 — 3.5
Nearest hundredth	3.47	3.46 — 3.468 — 3.47

Practice 4.07

A $5 gold coin weighs 8.359 grams. Use the information for Problems 1 and 2.

1 Locate and label 8.359 on the number line.



2 A scale measures to the nearest hundredth gram. What will the scale show for the weight of the coin?

8.36 grams

Grade 5 Unit 4 Lesson 7 339 Summary | Practice

Practice 4.07

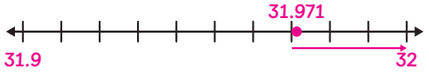
Name _____ Date _____

For Problems 3–5, round the decimal to the given place value. You can use the number line if it is helpful. Sample work shown.

3 Round 12.498 to the *nearest whole number.*

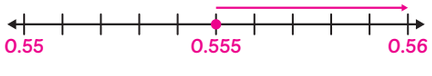
12

4 Round 31.971 to the *nearest tenth.*



32

5 Round 0.555 to the *nearest hundredth.*



0.56

6 Round 9.636 to the *nearest hundredth.*

Record your answer in the space provided.

9.64

Grade 5 Unit 4 Lesson 7 340 Practice

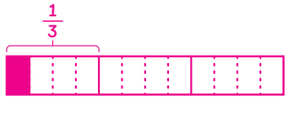
Practice 4.07

Name _____ Date _____

Spiral Review

7 4 friends equally share $\frac{1}{3}$ pounds of trail mix. How many pounds of trail mix does each friend receive? Sample work shown.

Show or explain your thinking.



answer: $\frac{1}{12}$ pounds

8 A runner completed 2 runs this week. The first run was 2.68 miles long. The second run was 3.18 miles long. What was the total length of both runs in miles? Sample work shown.

Show your thinking.

$$\begin{array}{r} {\scriptstyle 1} \\ 2.68 \\ +\ 3.18 \\ \hline 5.86 \end{array}$$

answer: 5.86 miles

For Problems 9 and 10, determine the sum. Sample work shown.

Show your thinking.

9 5.78 + 2.24

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 5.78 \\ +\ 2.24 \\ \hline 8.02 \end{array}$$

answer: 8.02

10 6.02 + 0.45

$$\begin{array}{r} 6.02 \\ +\ 0.45 \\ \hline 6.47 \end{array}$$

answer: 6.47

Grade 5 Unit 4 Lesson 7 341 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.2.C*
	2–5	1	5.2.C
Test Practice	6	1	5.2.C
Spiral Review			
	7	1	5.3.L
Fluency	8–10	1	4.4.A

*These problems build toward the standards shown.

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 7

Lesson Goal: Round decimals to the nearest whole number, tenth, and hundredth.

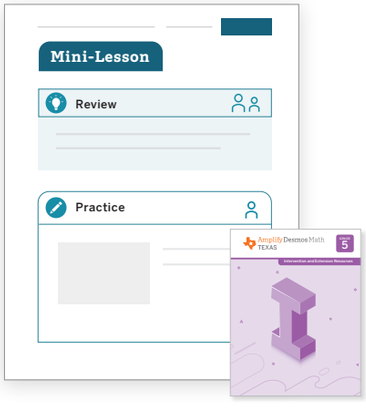
Support

Provide targeted intervention for students by using these resources.

If students round to any place value using the final digit in the number:

Respond:

- Assign the *Rounding Decimals* **Mini-Lesson.** | 15 min
- Review how numbers can be rounded to different place values and their proximity to the nearest multiple of that place value determines how it is rounded.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students round to any place using a number line:

Respond:

- Invite students to play these **Centers.** | 15 min
  Get Your Numbers in Order: Decimals
  Greatest of Them All: Decimals
  Mystery Number:
  - *Decimals*
  - ***Rounding Decimals***
- Have students complete **Lesson 7 Practice.** | 15 min
- **Item Bank**

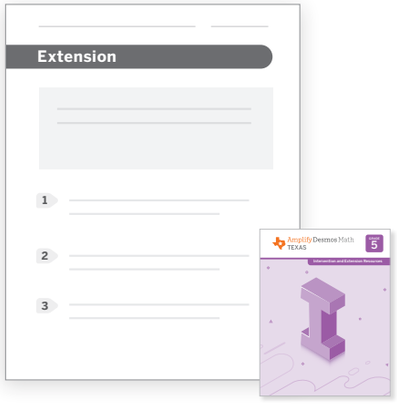
Stretch

Challenge students and extend their learning with these resources.

If students round to any place using place value understanding:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities.** | 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

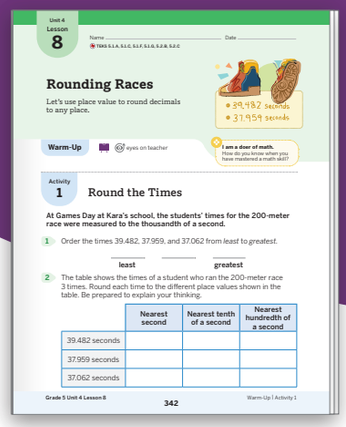
- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

Who participated in math class today? What assumptions are you making about those who did not participate? How could you leverage each of your students' ideas to support them in being seen and heard in the next math lesson?

Unit 4
Lesson
8

Student Edition pages and Presentation Screens support learning in this lesson.



Rounding Races

Rounding Decimals to the Hundredths in Context

Let's use place value to round decimals to any place.

Key Concepts

Today's Goals

1. **Goal:** Round decimals to the nearest whole, tenth, and hundredth.
2. **Goal:** Order decimals to the thousandths.
3. **Language Goal:** Explain why the rounded number can represent more than 1 possible exact number. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students order decimals to the thousandths from *least* to *greatest* or *greatest* to *least*. They use different real-world contexts to round decimals to the nearest whole, tenth, and hundredth, and they consider possible original numbers that round to a given value. Students recognize and explain that it is important to consider the situation to determine whether rounding, and to what place value, is appropriate because rounding can change the order of results. **(TEKS 5.1.A, 5.1.C, 5.1.F, 5.1.G)**

Prior Learning

In Lesson 7, students rounded decimals to the nearest whole, tenth, and hundredth using number lines and place value understanding.

Future Learning

In Lesson 9, students will add and subtract decimals to solve real-world problems.

Integrating Rigor in Student Thinking

- Students **apply** their understanding of rounding whole numbers and decimals to round decimals to any place value in the context of real-world problems.

Vocabulary

Review Vocabulary

rounding

TEKS

Addressing

5.2.C

Round decimals to tenths or hundredths.

Also Addressing: **5.2.B**

Math Process Standards: 5.1.A, 5.1.C, 5.1.F, 5.1.G

ELPS: 1.E, 1.F, 2.B, 2.E, 2.F, 3.D, 3.E, 3.F, 4.F

Building On	Building Toward
4.2.C	6.2.C
	6.2.D

Building Math Identity

I am a doer of math.
How do you know when you have mastered a math skill?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.A, 5.1.C, 5.1.F, 5.1.G, 5.2.B, 5.2.C

Warm-Up

Whole Class | 10 min

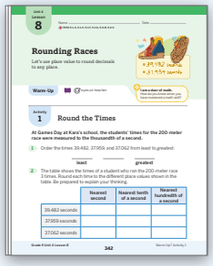
Students use the **Notice and Wonder** routine to share what they notice and wonder about a scale. They consider why the weights weigh a total of 12.32 ounces, but the scale reads 12.3 ounces, starting a discussion about rounding.

Activity 1

Pairs | 15 min

Students order race times from least to greatest and then round them to the nearest second, tenth of a second, and hundredth of a second. They apply their understanding of place value to determine multiple values that round to a given number.

Materials: Activity 1 PDF (as needed), *Rounding Process* chart (from Lesson 7)



Activity 2

Pairs | 20 min

Students apply their understanding of rounding decimals to different place values to reason whether statements about a 200-meter race are true or false. They recognize that rounding to different place values may influence the order of race times.

Materials: Activity 2 PDF
Additional Prep Cut out: Activity 2 PDF

Synthesis

Whole Class | 10 min

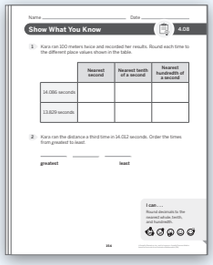
Students review and reflect on the conventions for rounding as they consider which numbers could represent a value rounded to the tenths and hundredths places.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by rounding 2 decimals to the nearest second, nearest tenth of a second, and nearest hundredth of a second. They then order 3 decimals from greatest to least.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames and word bank

ELPS 1.B, 1.E, 2.C, 2.D, 2.E, 2.F

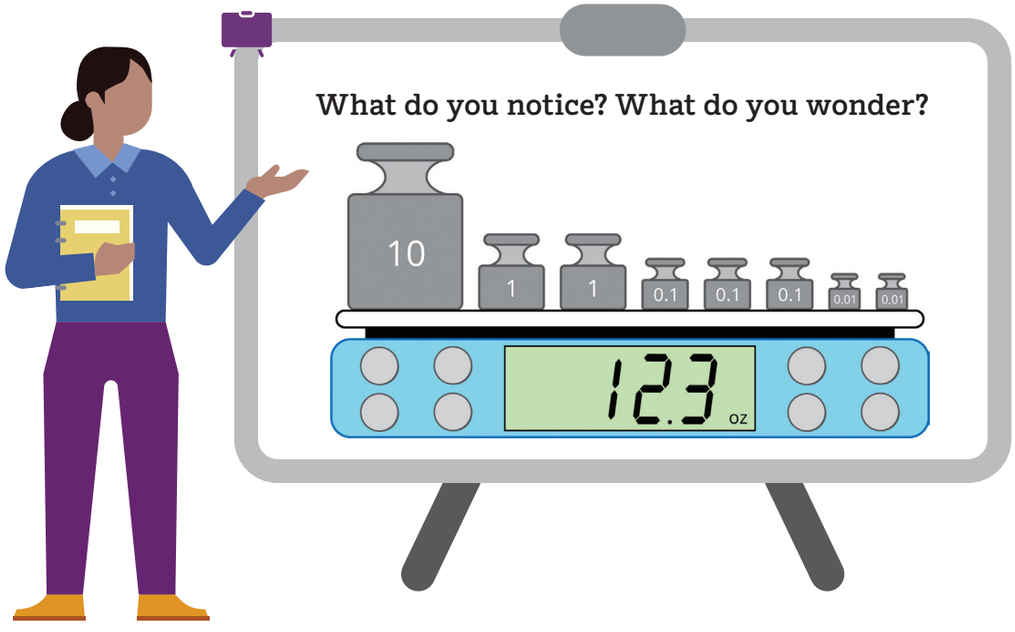
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screen

Warm-Up Notice and Wonder

Purpose: Students examine and share what they know about weights on a scale when the value shown does not represent the exact weight. As they share, students use their understanding of rounding in a real-world context.



1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Ask, "Is the scale accurate? Why or why not?"

Say, "In today's lesson, you will look at measurements and round them to different places."

Students might say . . . ELPS 2.B

I notice that the weights add up to 12.32 ounces, but the scale says the total weight is 12.3 ounces.

I notice that the scale only measures weights to the tenths.

I wonder why the scale does not read the 2 hundredths of an ounce.

I wonder what the scale would show if I added more 0.01-ounce weights.

Pairs | 15 min

Activity 1 Round the Times

Purpose: Students use place value reasoning to round decimals to the nearest whole number, tenth, and hundredth and to identify possible original values of numbers already rounded to the hundredths.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the Activity 1 PDF (as needed).

Classroom materials:

- Display the *Rounding Process* chart (from Lesson 7).

1 Launch

Read aloud the introduction and Problems 1–3.
For Problem 3, clarify that the exact finish times they identify should be times to the thousandth of a second.

Say, "As you complete Problems 2 and 3 with your partner, use the *Rounding Process* chart if it is helpful."

A **Accessibility: Conceptual processing** Provide access to the Activity 1 PDF for students who would benefit from having a pre-made number line to use for rounding.

2 Monitor

After students have completed **Problem 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What do you know about ordering from *least* to *greatest*?"
- Ask, "How have you ordered numbers before? How can that help you get started?"

3 Connect

Invite students to share their responses and reasoning for Problem 3. Continue until all possible values are shared.

Record the values on the number line.

Ask, "Why can numbers with a 5 or 6 in the tenths place round to the same number?"

Play the animation. ELPS 1.F

Key Takeaway: Say, "Different numbers may result in the same rounded value."

Unit 4 Lesson 8

Name _____ Date _____

TEKS 5.1.A, 5.1.C, 5.1.F, 5.1.G, 5.2.B, 5.2.C

Rounding Races

Let's use place value to round decimals to any place.

Warm-Up eyes on teacher

I am a doer of math.
How do you know when you have mastered a math skill?

Activity 1 Round the Times

At Games Day at Kara's school, the students' times for the 200-meter race were measured to the thousandth of a second.

1 Order the times 39.482, 37.959, and 37.062 from *least* to *greatest*.

37.062 (least), 37.959, 39.482 (greatest)

2 The table shows the times of a student who ran the 200-meter race 3 times. Round each time to the different place values shown in the table. Be prepared to explain your thinking.

	Nearest second	Nearest tenth of a second	Nearest hundredth of a second
39.482 seconds	39	39.5	39.48
37.959 seconds	38	38.0	37.96
37.062 seconds	37	37.1	37.06

Activity 1

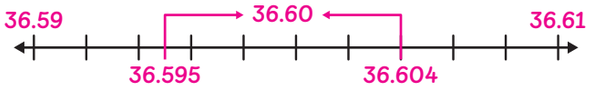
Name _____ Date _____

Round the Times (continued)

3 Another student ran the 200-meter race and their exact finish time was measured to the thousandth of a second. Their finish time rounded to the nearest hundredth was 36.60 seconds. What are 5 possible exact finish times to the thousandth of a second? Use the number line if it is helpful.

Show your thinking.

Sample response shown.



Time 1: 36.598 seconds

Time 2: 36.599 seconds

Time 3: 36.600 seconds

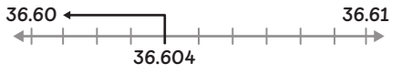
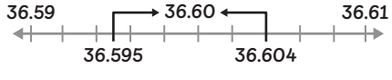
Time 4: 36.601 seconds

Time 5: 36.602 seconds

Other possible responses: 36.595, 36.596, 36.597, 36.603, and 36.604

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Reason that only numbers from 36.600 to 36.604 round to 36.60.		**Support** Ask, "What numbers would also round to 60 hundredths that do *not* have a 6 in the tenths place? Why?"
Almost there Reason that only numbers from 36.595 to 36.599 round to 36.60.		**Support** Ask, "What numbers would also round to 60 hundredths that do *not* have a 5 in the tenths place? Why?"
Reason that all numbers from 36.595 to 36.604 round to 36.60.		**Stretch** Ask, "Does your thinking apply to any decimal that is rounded to the nearest hundredth? Why or why not?"

Pairs | 20 min

Activity 2 Card Sort: Marching Miniatures

Purpose: Students use what they know about rounding decimals to different places to determine whether statements about the meter-race times are true or false.

Presentation Screens

Materials

Lesson Resources:

- Distribute one set of pre-cut cards from the Activity 2 PDF to each pair.

Short on time? Consider completing Problem 5 as a class.

1 Launch

Read aloud the introduction. ELPS 1.E

Ask, "What do you notice about the times in the table?"

Say, "The smaller the decimal, the faster the dog. You will complete Problems 4–6 with your partner."

A **Accessibility: Executive functioning** Vary the task demands for Problem 5 by selecting one of the false cards and demonstrating how to make it true. Give students time to ask clarifying questions. Then have pairs make the other false statement true.

EB **Emergent Bilinguals** Invite students to share different meanings of the term *tie*. Clarify that in this lesson a *tie* refers to 2 dogs finishing the race at the same time. ELPS 3.D, 3.E, 3.F

2 Monitor

After students have completed **Problem 4**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "Which card do you want to start with? What does it say?"
- Ask, "How could you use the table and what you know about rounding to determine whether the statement on each card is true or false?"

EB **Emergent Bilinguals** To support students as they write their responses to Problem 5, consider asking, "Will you write to describe or persuade? Will you write using a more formal or informal tone? What evidence can you include?" ELPS 4.F

3 Connect

Display the dogs' race times in order from fastest to slowest.

Use the Think-Pair-Share routine. Ask, "How would rounding each race time to different place values change the order of the race results?"

MLR **MLR8: Discussion Supports — Pressing for Details** ELPS 2.E

As students share their ideas about how the order of the race results might change, press for details in their reasoning. For example:

- If a student says, "I think they would be different." . . .
- Press for details by asking, "How do you know? How did the new times compare to the originals? What does that tell you about rounding?"

Key Takeaway: Say, "You can use what you know about place value to order decimals. When ordering decimals that have been rounded, the order depends on the place value with which they have been rounded to. When precision matters in a real-world scenario, rounding may not be helpful. Depending on which place value you round to, the order of the results can change."

Activity 2

Name _____ Date _____

Card Sort: Marching Miniatures

Kara used what she learned in the afterschool STEM lab to make her collectible miniatures move. She set up a 1-meter race between 5 of the miniatures. The table shows their finish times.

Hands-On

You and your partner will be given a set of cards.

Miniature	Time (seconds)
pug	28.626
toy poodle	28.532
corgi	28.708
Chihuahua	28.634
French bulldog	28.561

4 Sort

Use the finish times to sort the cards into 2 piles: *true* and *false*. Record the letters of the cards in the table.

True	False
A, B, E	C, D

Activity 2

Name _____ Date _____

Card Sort: Marching Miniatures (continued)

5 Rewrite 1 false statement to make it true. Sample responses shown.

statement: C

Rounding to the nearest tenth makes the toy poodle and corgi faster than their original times, but the French bulldog is slower than its original time.

or

D; The French bulldog has the same time as the pug and Chihuahua.

6 Order the miniatures' race times from *fastest* to *slowest*.

28.532, 28.561, 28.626, 28.634, 28.708

fastest slowest

Presentation Screens

D Differentiation | Teacher Moves

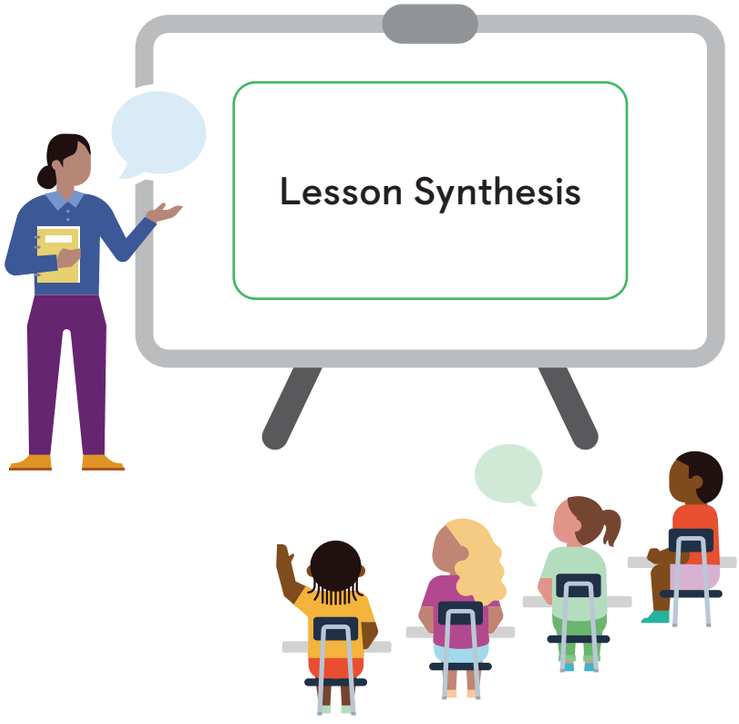
Look for students who . . .	For example . . .	Provide support . . .
Almost there Attend to some of the information on the cards.	toy poodle: 28.532 → 28.5 corgi: 28.708 → 28.7 Card C is true because the rounding makes the toy poodle and corgi faster.	**Support** Ask, "What happens to the time of the French bulldog when rounded to the nearest tenth of a second?"
Round the times to the place value specified on the card and then reason if the card is true or false.	toy poodle: 28.532 → 28.5 corgi: 28.708→28.7 French bulldog: 28.561 → 28.6 Card C is false. The rounded time for the French bulldog is slower than its original time.	**Stretch** Ask, "How does this strategy help you rewrite a false statement in Problem 4?"

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Decimals can be ordered least to greatest and greatest to least. When decimals are rounded prior to ordering, the order depends on the place value with which they are rounded to.



Ask:

- "What number could I be thinking about?"
- "Why could it be more than 1 number?"
- "What is a number it could *not* be? Why?"

Say, "Different strategies can be used to round decimals. The rounding conventions explain why more than 1 number can be rounded to the same value."

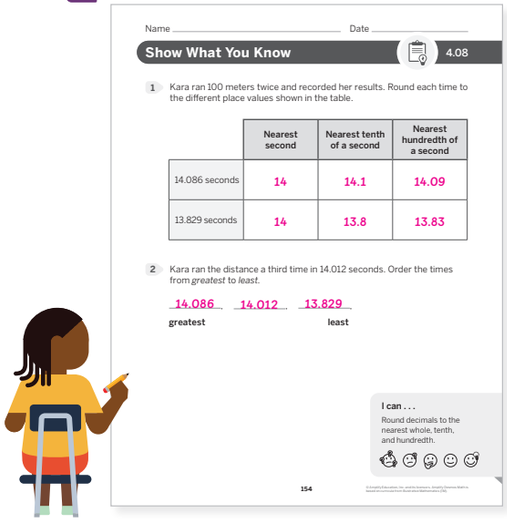
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF



Name _____ Date _____

Show What You Know 4.08

1 Kara ran 100 meters twice and recorded her results. Round each time to the different place values shown in the table.

	Nearest second	Nearest tenth of a second	Nearest hundredth of a second
14.086 seconds	14	14.1	14.09
13.829 seconds	14	13.8	13.83

2 Kara ran the distance a third time in 14.012 seconds. Order the times from *greatest* to *least*.

14.086 (greatest) 14.012 13.829 (least)

I can . . .
Round decimals to the nearest whole, tenth, and hundredth.

154

Today's Goals

1. **Goal:** Round decimals to the nearest whole, tenth, and hundredth.
   - In Problem 1 in the *Show What You Know*, students rounded 2 decimals to the nearest whole, tenth, and hundredth.
2. **Goal:** Order decimals to the thousandths.
   - In Problem 2 in the *Show What You Know*, students ordered 3 decimals from greatest to least.
3. **Language Goal:** Explain why the rounded number can represent more than 1 possible exact number. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 8
Practice

Students using digital

Students using print

Summary 4.08

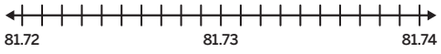
A variety of numbers round to the same number, which is why context matters and why many place values are included for certain contexts.

The table shows the times of a student who ran the 200-meter race twice.

	Nearest second	Nearest tenth of a second	Nearest hundredth of a second
48.561	49	48.6	48.56
48.596	49	48.6	48.60

Practice 4.08

1 Rounded to the nearest hundredth, a luge rider's fastest speed was 81.73 miles per hour. Write 10 different possible speeds that could have been the rider's fastest speed to the thousandth of a mile per hour. Use the number line if it is helpful.



81.725 81.726 81.727 81.728 81.729

81.730 81.731 81.732 81.733 81.734

Practice 4.08

Name _____ Date _____

2 The table shows all-around scores from a gymnastic meet. Round each score to the different place values shown in the table.

	Nearest whole number	Nearest tenth	Nearest hundredth
91.402	91	91.4	91.40
91.471	91	91.5	91.47
91.084	91	91.1	91.08
90.975	91	91.0	90.98

3 Order the scores 91.402, 91.471, 91.084, and 90.975 from *greatest* to *least*.

91.471, 91.402, 91.084, 90.975

greatest least

4 The table shows the weights of different animals at the shelter. Which weights would be rounded to 33.8 as the nearest tenth?

Select **THREE** correct answers.

Weights
● 33.802
● 33.78
○ 33.18
● 33.844
○ 33.885

Practice 4.08

Name _____ Date _____

Spiral Review

5 Determine the quotient 1,404 ÷ 36. Sample work shown.

Show your thinking.

$$\begin{array}{r} 9 \\ 10 \\ 20 \\ \hline 36\overline{)1404} \\ -\ 720 \\ \hline 684 \\ -\ 360 \\ \hline 324 \\ -\ 324 \\ \hline 0 \end{array}$$

20 + 10 + 9 = 39

answer: 39

For Problems 6 and 7, determine the difference.

Show your thinking.

6 3.59 – 1.72

$$\begin{array}{r} 2\ 15 \\ 3.59 \\ -\ 1.72 \\ \hline 1.87 \end{array}$$

answer: 1.87

7 10.63 – 8.49

$$\begin{array}{r} 10\ 513 \\ 10.63 \\ -\ 8.49 \\ \hline 2.14 \end{array}$$

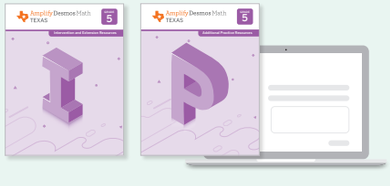
answer: 2.14

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 2	2	5.2.C
	3	2	5.2.B
Test Practice	4	1	5.2.C
Spiral Review			
Fluency	5	1	5.3.C
Fluency	6, 7	1	4.4.A, 5.3.K*

*These problems build toward the standard shown

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 8

Lesson Goal: Round decimals to the nearest whole, tenth, and hundredth.

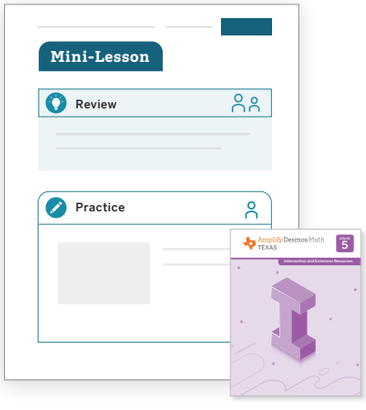
Support

Provide targeted intervention for students by using these resources.

If students round a given decimal to the nearest whole:

Respond:

- Assign the *Rounding Times Given in Seconds* **Mini-Lesson. |** 15 min
- Revisit Lesson 7.



Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students round a given decimal to the nearest whole and tenth:

Respond:

- Invite students to play these **Centers. |** 15 min
  Get Your Numbers in Order: Decimals
  Greatest of Them All: Decimals
  Mystery Number:
  - *Decimals*
  - ***Rounding Decimals***
- Have students complete **Lesson 8 Practice. |** 15 min
- **Item Bank**

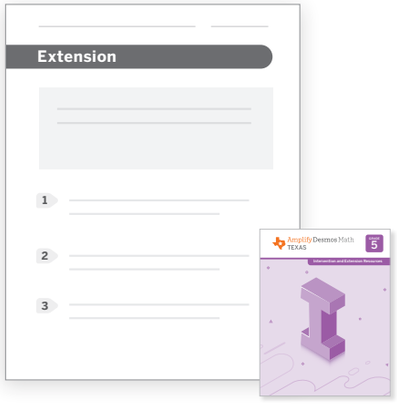
Stretch

Challenge students and extend their learning with these resources.

If students round a given decimal to the nearest whole, tenth, and hundredth:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

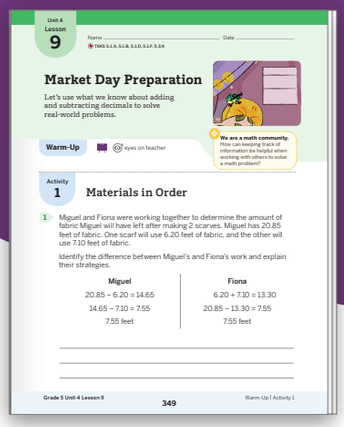
- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

What strategy did you anticipate today? What did you not anticipate?

Unit 4
Lesson
9

Student Edition pages and Presentation Screens support learning in this lesson.


Unit 4 Lesson 9

Market Day Preparation

Let's use what we know about adding and subtracting decimals to solve real-world problems.

Warm-Up

Activity 1 Materials in Order

1 Miguel and Fiona were working together to determine the amount of fabric Miguel will have left after making 2 scarves. Miguel has 20.85 feet of fabric. One scarf will use 6.20 feet of fabric, and the other will use 7.10 feet of fabric.

Identify the difference between Miguel's and Fiona's work and explain their strategies.

Miguel	Fiona
20.85 − 6.20 = 14.65 14.65 − 7.10 = 7.55 7.55 feet	6.20 + 7.10 = 13.30 20.85 − 13.30 = 7.55 7.55 feet

Grade 5 Unit 4 Lesson 9 349 Warm-Up | Activity 1

Market Day Preparation

Adding and Subtracting Decimals in Real-World Problems

Let's use what we know about adding and subtracting decimals to solve real-world problems.

Key Concepts

Today's Goals

1. **Goal:** Fluently add and subtract positive rational numbers.
2. **Language Goal:** Compare different strategies used to solve a multi-step problem involving addition and subtraction of decimals to the hundredths. **(Listening, Speaking, and Writing)** **ELPS 1.E, 2.E, 2.F, 4.D, 4.F**

Connections and Coherence

Students compare 2 strategies for solving a story problem to determine that there is often more than 1 way to solve multi-step problems involving addition and subtraction of decimals. They then analyze story problems involving both decimals and fractions and use their understanding of equivalent decimals and fractions to formulate a plan for solving. **(TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.F)**

Prior Learning

In Grade 4, students added and subtracted whole numbers and decimals to the hundredths place using the standard algorithm.

Future Learning

In Lesson 10, students will represent and solve for multiplication of decimals with products to the hundredths using objects.

Integrating Rigor in Student Thinking

- Students strengthen their **fluency** with adding and subtracting decimals to the hundredths.
- Students **apply** their understanding of addition and subtraction strategies to solve multi-step story problems.

Vocabulary

Review Vocabulary

difference

sum

TEKS

Addressing

5.3.K

Fluently add and subtract positive rational numbers.

Math Process Standards: 5.1.A, 5.1.B, 5.1.D, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.A, 3.E, 3.F, 3.G, 3.H, 4.D, 4.F

Building On

4.4.A

Building Math Identity

We are a math community.
How can keeping track of information be helpful when working with others to solve a math problem?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

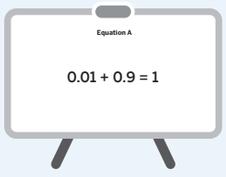
TEKS: 5.1.A, 5.1.B, 5.1.D, 5.1.F, 5.1.G, 5.3.K

Warm-Up

Fluency

Whole Class | 10 min

Students use the **True or False?** routine to determine whether a series of decimal addition and subtraction equations are true or false and justify their reasoning. They have the opportunity to reason using strategies that may include place value.
(TEKS 5.1.G)



Activity 1

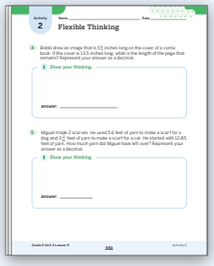
Pairs | 15 min

Students compare 2 methods for determining the answer to a multi-step story problem. They will then use either method to solve multi-step story problems, and conclude that both methods are efficient ways for solving.

Activity 2

Pairs | 20 min

Students analyze a multi-step story problem involving decimals and fractions to determine strategies for solving. They use the **Gallery Tour** routine to compare different ways to solve the same multi-step story problem.



Synthesis

Whole Class | 10 min

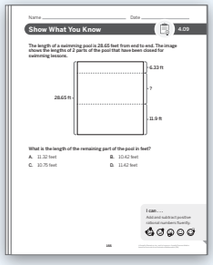
Students review and reflect on what they know about decimal addition and subtraction after completing this sub-unit.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by adding and subtracting positive rational numbers fluently.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F, 4.C, 4.D, 4.F

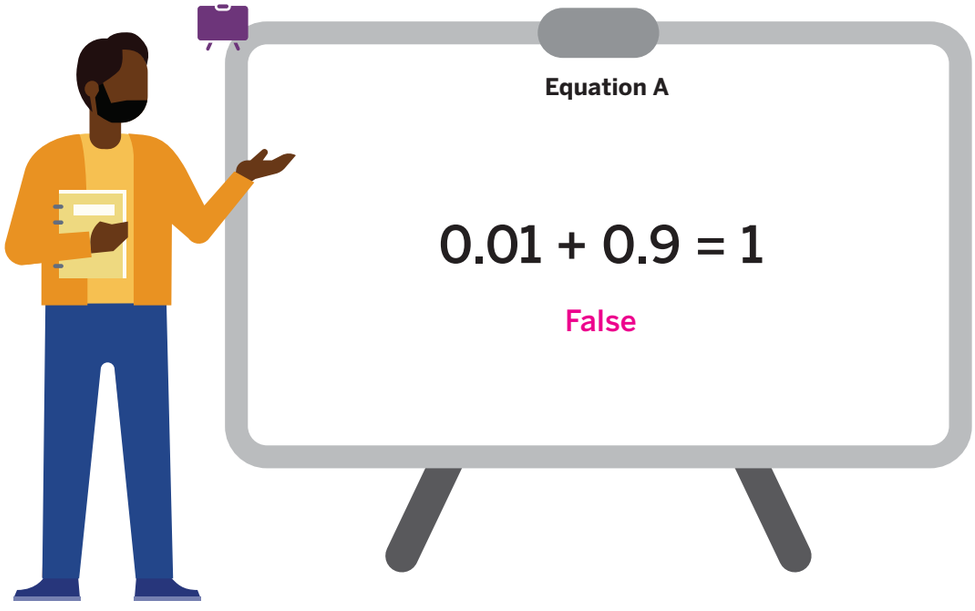
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** and **write** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** and **write** using a variety of sentence types.	Students **listen** to spoken English and **speak** and **write** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screen

Warm-Up True or False? Fluency

Purpose: Students analyze equations involving decimal addition and subtraction, without evaluating, to develop strategies for adding and subtracting.



Equation B

0.01 + 0.99 = 1

True

Equation C

1.0 − 0.9 = 0.10

True

Equation D

1.0 − 0.01 = 0.09

False

Why these problems? These equations lend themselves to preparing students to add and subtract fluently in Activity 1.

1 Launch

Use the True or False? routine.

Display 1 equation at a time.

Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

Record 2 or 3 students' responses, asking for their reasoning and allowing others to agree or disagree. Keep each equation displayed as you progress to the next.

Repeat with each equation.

Ask, "How did you use your understanding of place value to reason without evaluating?"

Say, "In today's lesson, you will use addition and subtraction strategies and place value reasoning to add and subtract decimals."

Students might say . . . ELPS 2.B, 2.C, 2.D, 2.E

1: False. 1 hundredth and 9 tenths is 91 hundredths.

2: True. 99 hundredths is 1 hundredth less than 1 whole.

3: True. 1 whole is the same as 10 tenths, so 10 tenths minus 9 tenths is 1 tenth, or 10 hundredths.

4: False. 1 hundredth less than 1 whole is 99 hundredths.

Pairs | 15 min

Activity 1 Materials in Order

Purpose: Students apply their understanding of addition and subtraction with decimals to solve real-world problems.

Presentation Screens

Short on time? Consider completing Problem 3 as a class.

1 Launch

Read aloud Problem 1.

Say, "Work with your partner to solve Problems 1–3."

EB **Emergent Bilinguals** Encourage students to reread the introduction on their own and then summarize it with a partner. If possible, pair students with peers who speak the same primary language so they can discuss in their primary language. ELPS 3.E

2 Monitor

While students complete **Problem 3**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What do you notice about Miguel's work? What do you notice about Fiona's work?"
- Ask, "What did Miguel and Fiona do differently?"

EB **Emergent Bilinguals** To support students as they write their responses to Problem 1, consider asking, "Will you write to describe information or to persuade someone with your opinion? Will you write using a more formal or informal tone? What evidence can you include?" ELPS 4.F

3 Connect

Use the Think-Pair-Share routine. Invite students to take turns sharing their responses to Problem 3.

Display 2 strategies for determining the length of the remaining part of the poster. Ask, "What is similar about both strategies for solving? What is different?"

Say, "When solving problems where the whole and 2 parts are known, you can add the 2 known parts together before taking away from the whole. Or, you can take each part away from the whole to determine the answer."

Key Takeaway: Say, "Many different strategies can be used to solve multi-step story problems involving addition and subtraction of decimals. You can use what you know about adding and subtracting decimals to solve real-world problems."

Unit 4 Lesson 9

Name _____ Date _____

TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.F, 5.3.K

Market Day Preparation

Let's use what we know about adding and subtracting decimals to solve real-world problems.

We are a math community. How can keeping track of information be helpful when working with others to solve a math problem?

Warm-Up eyes on teacher

Activity 1 Materials in Order

1 Miguel and Fiona were working together to determine the amount of fabric Miguel will have left after making 2 scarves. Miguel has 20.85 feet of fabric. One scarf will use 6.20 feet of fabric, and the other will use 7.10 feet of fabric.

Identify the difference between Miguel's and Fiona's work and explain their strategies. Sample response shown.

Miguel	Fiona
20.85 – 6.20 = 14.65	6.20 + 7.10 = 13.30
14.65 – 7.10 = 7.55	20.85 – 13.30 = 7.55
7.55 feet	7.55 feet

Miguel subtracted the amount of fabric for both scarves from the total, while Fiona added the scarf lengths together before subtracting.

Activity 1

Name _____ Date _____

Materials in Order (continued)

2 Kara had a 2 liter bottle of paint. She put 0.59 liters of paint in one container and 0.82 liters of paint in a second container. How many liters of paint remained in the bottle? Sample work shown.

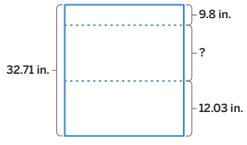
Show your thinking.

$$\begin{array}{r} {\scriptstyle 1} \\ 82 \text{ hundredths} \\ +\ 59 \text{ hundredths} \\ \hline 141 \text{ hundredths} \end{array} \qquad \begin{array}{r} 200 \text{ hundredths} \\ -\ 141 \text{ hundredths} \\ \hline 59 \text{ hundredths} \end{array}$$

answer: 0.59 liters

3 Bobbi cut paper to make a poster for Market Day. The image shows the lengths of the top and bottom of the poster that Bobbi cut off.

What is the length of the remaining part of the poster in inches?



Show your thinking.

Sample work shown.

$$9.8 + 12.03 = 21.83$$
$$32.71 - 21.83 = (32.71 - 21) - 0.83$$
$$= 11.71 - 0.83 = 10.71 + (1 - 0.83)$$
$$= 10.71 + 0.17 = 10.88$$

answer: 10.88 inches

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Solve using only 1 part of the information.	32.71 – 9.80 = 22.91 22.91 inches	**Support** Ask, "How many parts are represented in the image? How many parts are represented in your work?"
Solve by subtracting each part from the whole to determine the unknown.	32.71 – 9.80 = 22.91 22.91 – 12.03 = 10.88, so 10.88 inches	**Stretch** Ask, "Will this strategy always work in addition and subtraction of decimal problems? When is this strategy most helpful?"
Solve by adding the 2 known parts before subtracting from the whole to determine the unknown.	9.80 + 12.03 = 21.83 32.71 – 21.83 = 10.88, so 10.88 inches	

Pairs | 20 min

Activity 2 Flexible Thinking

Purpose: Students analyze addition and subtraction story problems involving decimals and fractions to determine a plan for solving.

Presentation Screens

Short on time? Consider comitting Problem 6.

1 Launch

MLR **MLR6: Three Reads** ELPS 1.E, 2.F, 3.A, 3.F, 3.G, 3.H

Read Problem 4 aloud three times.

- **Read 1:** Say, "Tell your partner what happened in the problem without using any numbers."
- **Read 2:** Say, "Name the numbers and tell what they mean in the problem."
- **Read 3:** Ask, "What do you know about the size of the answer?"

Say, "Work with your partner to complete Problems 4–7."

A **Accessibility: Visual-spatial processing** Suggest students underline, highlight, or circle important information in each story problem before solving.

2 Monitor

While students complete **Problem 5**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What do you notice about the numbers in the problem?"
- Ask, "What do you need to do first?"

3 Connect

Use the Gallery Tour routine. Say, "We will do a Gallery Tour of Problem 5. Consider the different strategies your classmates used to determine the amount of yarn Miguel had left over."

A **Accessibility: Memory and attention** Provide students with prompts to guide their reviews during the Gallery Tour, including "What do you notice about how this pair determined the answer? What do you wonder? What questions do you have?"

Use the Think-Pair-Share routine. Ask:

- "How are all the strategies similar? How are they different?"
- "How did your classmates work with both fractions and decimals?"
- "Why did each strategy result in the same answer?"

Key Takeaway: Say, "There are often different ways to solve multi-step problems to get the same result, and it can be helpful to think flexibly about how to add or subtract decimals and fractions. In scenarios where both decimals and fractions are involved, you can identify the equivalent decimals or fractions and then add or subtract."

Student Edition

Activity 2

Name _____ Date _____

Flexible Thinking

4 Bobbi drew an image that is $5\frac{1}{4}$ inches long on the cover of a comic book. If the cover is 13.5 inches long, what is the length of the page that remains? Represent your answer as a decimal. **Sample work shown.**

Show your thinking.

$$13.5 - 5.25 = (13 - 5) + (0.5 - 0.25)$$
$$8 + 0.25$$
$$= 8.25$$

answer: 8.25 inches

5 Miguel made 2 scarves. He used 5.6 feet of yarn to make a scarf for a dog and $3\frac{2}{10}$ feet of yarn to make a scarf for a cat. He started with 12.85 feet of yarn. How much yarn did Miguel have left over? Represent your answer as a decimal. **Sample work shown.**

Show your thinking.

$$12.85 - (5.6 + 3.2)$$
$$12.85 - 8.80$$
$$= 4.05$$

answer: 4.05 feet

Activity 2

Name _____ Date _____

Flexible Thinking (continued)

6 Jonathan measured the lengths in centimeters of 3 puzzle pieces. One measured 2.89 centimeters, the second measured $2\frac{3}{4}$ centimeters, and the third measured 2.1 centimeters. What is the total length of the puzzle pieces in centimeters? **Sample work shown.**

Show your thinking.

$$2.89 + 2.75 + 2.10 = 6 + (0.89 + 0.75 + 0.10)$$
$$= 6 + (0.99 + 0.75) = 6 + 1.74 = 7.74$$

answer: 7.74 centimeters

7 A baker started the week with 120 cups of flour. The table shows the amount of flour the baker used each day.

Monday	Tuesday	Wednesday	Thursday	Friday
26.35 cups	$22\frac{3}{4}$ cups	$25\frac{1}{5}$ cups	19.55 cups	11.95 cups

How much flour did the baker have left at the end of the week?

Show your thinking.

Sample work shown.

$$\begin{array}{r} {\scriptstyle 2\ 1\ 1} \\ 26.35 \\ 22.75 \\ 25.20 \\ 19.55 \\ +\ 11.95 \\ \hline 105.80 \end{array} \qquad \begin{array}{r} {\scriptstyle 9} \\ {\scriptstyle 1\ 10\ 10} \\ 120.00 \\ -\ 105.80 \\ \hline 14.20 \end{array}$$

answer: 14.20 cups

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Solve using whole number understanding and represent the answer as a whole number.	1,285 hundredths − 560 hundredths + 320 hundredths 1,285 − 880 = 405 405 feet	**Support** Ask, "Using whole number reasoning can be helpful for adding and subtracting decimals fluently. How can you use the information in the story problem to evaluate the reasonableness of your answer?"
Solve using equivalent fractions and represent the answer in decimal form.	$12\frac{85}{100} - 5\frac{60}{100} + 3\frac{20}{100}$ $= 12\frac{85}{100} - 8\frac{80}{100}$ $= 4\frac{5}{100}$ 4.05 feet	**Stretch** Ask, "Would you use the same strategy when adding or subtracting with fractions such as $\frac{1}{3}$? Why or why not?"
Solve using equivalent decimals and represent the answer in decimal form.	12.85 − (5.6 + 3.2) = 12.85 − 8.80 = 4.05 4.05 feet	

Whole Class | 10 min

Presentation Screens

Synthesis

Lesson Takeaway: There are often different ways to solve multi-step problems. It can be helpful to consider known information and how that information will be used before evaluating the problem when both fractions and decimals are involved.

Use the Think-Pair-Share routine. Invite students to reflect on what they have learned about addition and subtraction with decimals. Encourage them to use the sentence stems to structure their conversations with their partners.

Say, "In this sub-unit, you have seen that there are many different strategies to add and subtract decimals to the hundredths. When solving real-world, multi-step problems, it can be helpful to consider what information you have and how you will use that information *before* evaluating the problem."

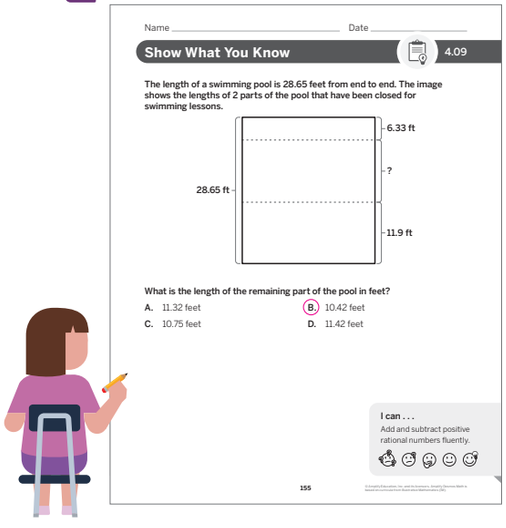
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF



Name _____ Date _____

Show What You Know 4.09

The length of a swimming pool is 28.65 feet from end to end. The image shows the lengths of 2 parts of the pool that have been closed for swimming lessons.

What is the length of the remaining part of the pool in feet?

A. 11.32 feet
B. 10.42 feet
C. 10.75 feet
D. 11.42 feet

I can . . .
Add and subtract positive rational numbers fluently.

155

Today's Goals

1. **Goal:** Fluently add and subtract positive rational numbers.
   - In the *Show What You Know*, students added and subtracted decimals to solve a multi-step story problem.
2. **Language Goal:** Compare different strategies used to solve a multi-step problem involving addition and subtraction of decimals to the hundredths. **(Listening, Speaking, and Writing)** ELPS 1.E, 2.E, 2.F, 4.D, 4.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 9
Practice

Students using digital

Students using print

Summary 4.09

There are often different ways to solve multi-step problems to get the same result. It can be helpful to examine the information in the story problem before determining how you will evaluate. When both decimals and fractions are involved, it is helpful to determine either equivalent fractions or equivalent decimals before adding or subtracting.

Miguel made 2 scarves from 20 feet of fabric. If one scarf was 8.25 feet and the other was $6\frac{1}{2}$ feet, how much fabric did he have left? Represent your answer as a decimal.

Subtract (decimal form)	Add then subtract (decimal form)	Subtract (fraction form)	Add then subtract (fraction form)
$20 - 8.25 = 11.75$ $11.75 - 6.50$ $= 5.25$ feet	$8.25 + 6.50 = 14.75$ $20 - 14.75$ $= 5.25$ feet	$20 - 8\frac{1}{4} = 11\frac{3}{4}$ $11\frac{3}{4} - 6\frac{2}{4} = 5\frac{1}{4}$ $5\frac{1}{4} = 5.25$ feet	$8\frac{1}{4} + 6\frac{2}{4} = 14\frac{3}{4}$ $20 - 14\frac{3}{4} = 5\frac{1}{4}$ $5\frac{1}{4} = 5.25$ feet

Practice 4.09

1 An athlete set a goal to run 200 miles in 3 months. She ran 60.8 miles in May and 72.14 miles in June. How many miles does the athlete have to run in July to reach her goal? Sample work shown.

Show your thinking.

$200 - 60.80 = 139.20$

$139.20 - 72.14 = (139 - 72) + (0.20 - 0.14)$

$= 67 + 0.06 = 67.06$ miles

answer: 67.06 miles

Practice 4.09

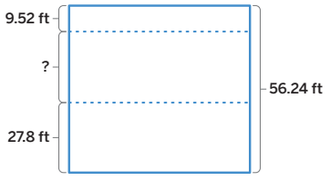
Name _____ Date _____

2 Shawn bought a new book. The regular price of the book is $15.60. Shawn paid $1.75 less than the regular price for the book. Shawn also bought a new bookmark for $2.36. What is the total amount of money Shawn paid for the book and bookmark?

(A) $19.71 (B) $11.49

(C) $16.21 (D) $12.49

3 An artist painted a mural on a wall. The artist painted the top of the wall and the bottom of the wall. The image shows the heights of the 2 parts of the wall that have been painted.



What is the height of the remaining part of the wall in feet?

Show your thinking.

Sample work shown.

$27.80 + 9.52 = 37.32$

$56.24 - 37.32 = (56.24 - 37) - 0.32$

$19.24 - 0.32 = 18.92$

answer: 18.92 feet

Practice 4.09

Name _____ Date _____

4 Kara wanted to see how long it would take to paint each of the miniatures. She recorded the times in the table.

Miniature	Unicorn	Goblin	Knight	Ogre
Time (min)	15.75	$9\frac{1}{2}$	18.25	12 1/4

How long did it take Kara to paint the miniatures altogether? Represent your answer in decimal form. Sample work shown.

Show your thinking.

$$\begin{array}{r} {\scriptstyle 2\,1\ 1} \\ 15.75 \\ 18.25 \\ 12.25 \\ +\ \ 9.50 \\ \hline 55.75 \end{array}$$

answer: 55.75 minutes

Spiral Review

For Problems 5 and 6, determine the product. Sample work shown.

Show your thinking.

5 35×109

$$\begin{array}{r} {\scriptstyle 2\ 4} \\ 109 \\ \times\ \ 35 \\ \hline 545 \\ +\ 3,270 \\ \hline 3,815 \end{array}$$

answer: 3,815

6 246×61

$$\begin{array}{r} {\scriptstyle 2\ 3} \\ 246 \\ \times\ \ 61 \\ \hline 246 \\ +\ 14,760 \\ \hline 15,006 \end{array}$$

answer: 15,006

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Fluency	1	2	5.3.K
Test Practice	2	1	5.3.K
Fluency	3, 4	2	5.3.K
Spiral Review			
Fluency	5, 6	1	5.3.B

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 9

Lesson Goal: Fluently add and subtract positive rational numbers.

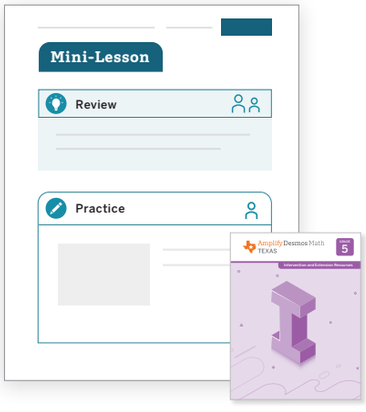
Support

Provide targeted intervention for students by using these resources.

If students make a calculation error:

Respond:

- Assign the *Solving Real-World Problems Involving Adding and Subtracting Decimals* Mini-Lesson. | 15 min
- Invite students to discuss strategies for solving multi-step story problems with a partner.



Strengthen

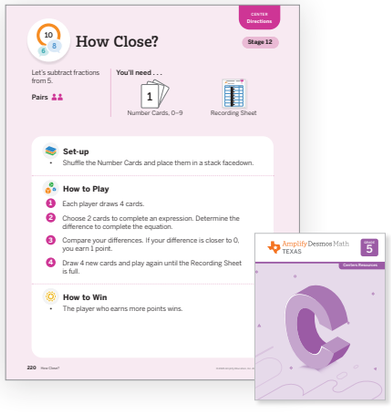
Reinforce students' understanding of the concepts assessed by using these resources.

If students add and subtract decimals to the hundredths:

Respond:

- Invite students to play these **Centers.** | 15 min
  How Close?:
  - *Subtract Fractions From 5*
  - *Add and Subtract Within 100*

  Target Numbers:
  - *Add Tenths or Hundredths*
  - ***Subtract Tenths or Hundredths***
- Have students complete **Lesson 9 Practice.** | 15 min
- **Item Bank**



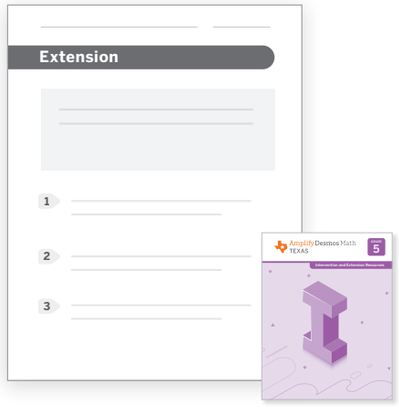
Stretch

Challenge students and extend their learning with these resources.

If students fluently add and subtract decimals to the hundredths:

Respond:

- Invite students to explore the **Sub-Unit 1 Extension Activities.** | 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

Reflect on a time your thinking changed about something in class recently. How will you alter your teaching practice to incorporate your new understanding?

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Quiz: Sub-Unit 1

Independent | 20 min

Facilitation: Assign this Sub-Unit Quiz at the end of Sub-Unit 1 to evaluate students' proficiency with the key concepts and skills addressed in this sub-unit.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problem(s)	Concept or skill	DOK	TEKS
1	Identifying different representations of a multi-digit decimal	2	5.2.A *(S)*
2	Comparing decimals to the thousandths	1	5.2.B *(R)*
3, 4	Rounding decimals to any place	1	5.2.C *(S)*
5	Adding decimals to the hundredths	2	5.3.K *(R)*
6	Subtracting decimals to the hundredths	1	5.3.K *(R)*

Assessment Resources

- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources

Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

During Sub-Unit 2, if students need further review or practice with concepts or skills, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

PDF *Assessment Resource PDF*

Digital

Unit 4
Quiz: Sub-Unit 1

Name _____ Date _____

Quiz: Sub-Unit 1

Unit 5.4

1 Select **THREE** representations of 0.631.

- **A.** six hundred thirty-one hundredths
- **B.** (3 × 0.1) + (6 × 0.01) + (1 × 0.001)
- **C.** $\frac{631}{1,000}$
- **D.** six hundred thirty-one thousandths
- **E.** (6 × 0.1) + (3 × 0.01) + (1 × 0.001)

2 Complete the comparison statement using <, >, or =.

62.5 ___>___ 62.059

Show or explain your thinking.

Sample work shown.

Both numbers have 62 ones, so I compared the digits in the tenths place. 5 tenths is greater than 0 tenths, so 62.5 is greater than 62.059.

3 Round 13.728 to the nearest tenth.

13.7

4 Round 13.728 to the nearest hundredth.

13.73

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Name _____ Date _____

Quiz: Sub-Unit 1 (continued)

5 Priya ran 1.9 miles on Saturday and 2.34 miles on Sunday. How many miles did Priya run altogether?

Show your thinking.

Sample work shown.

$$\begin{array}{r} {\scriptstyle 1} \\ 2.34 \\ +\ 1.90 \\ \hline 4.24 \end{array}$$

answer: 4.24 miles

6 Determine the difference.

1 – 0.15

Show or explain your thinking.

Sample work shown.

$$\begin{array}{r} {\scriptstyle 0\ \ 9\ 10} \\ 1.00 \\ -\ 0.15 \\ \hline 0.85 \end{array}$$

answer: 0.85

D Differentiation (Quiz: Sub-Unit 1)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goals	Problem(s)	Respond to Student Thinking

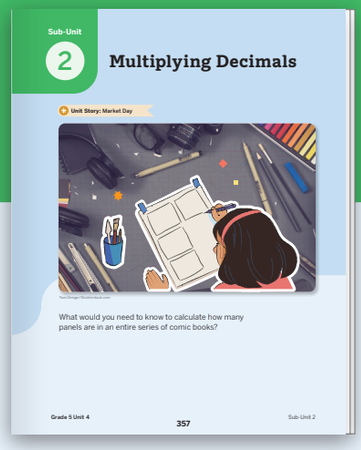
Sub-Unit 1:
• Read, write, and represent decimals to the thousandths, including in expanded form and expanded notation.
• Compare and order two decimals to the thousandths using the symbols >, <, or =.
• Round decimals to tenths or hundredths.
• Add and subtract decimals to the hundredths using strategies based on place value.
	1	**Support**
		• **Mini-Lessons:**
		  • *Representing Decimals* (ML 4.02)
		  • *Writing Decimals in Expanded Notation* (ML 4.03)

	2	**Support** • **Mini-Lesson:** *Comparing Decimals to the Thousandths* (ML 4.06) • **Center:** *Get Your Numbers in Order: Decimals*
	3, 4	**Support** • **Mini-Lesson:** *Rounding Decimals* (ML 4.07)
	5	**Support** • **Mini-Lesson:** *Solving Real-World Problems Involving Adding and Subtracting Decimals* (ML 4.09) • **Teacher Move:** Have students review the problem using estimation. Then provide another opportunity for students to solve a real-world problem involving addition of decimals.
	6	**Support** • **Center:** *How Close?, Subtract Decimals From 1*

Notes:

Sub-Unit 2

Multiplying Decimals



Sub-Unit 2 Goals

- Multiply decimals with products resulting in the hundredths using place value reasoning and properties of operations.

Progression of TEKS in Sub-Unit 2

- **Lessons 10–11:** Students use base-ten blocks, whole number reasoning, and the Associative and Distributive Properties of Multiplication to determine the products of decimals to the hundredths and whole numbers.
- **Lessons 12–13:** Students use hundredths models and area models to multiply decimal factors to the hundredths.

Sub-Unit 2 Progression	Lesson 10	Lesson 11	Lesson 12	Lesson 13
Number operations				
TEKS 5.3.D	●	●	●	●
TEKS 5.3.E	●	●	●	●

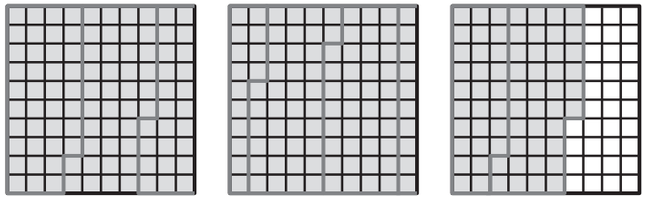
Coming up Next

- **Sub-Unit 3, Lessons 14–17:**
  - » Number Operations: **TEKS 5.3.A, 5.3.F, 5.3.G**

Math That Matters Most

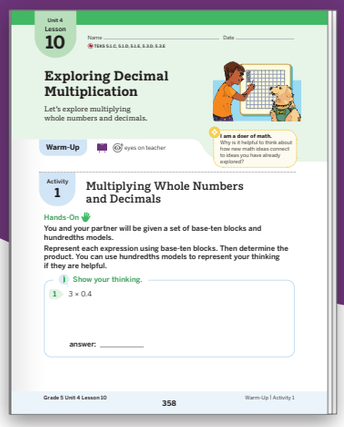
Sub-Unit 2: Use place value reasoning and properties of operations to multiply decimals to hundredths by whole numbers and decimals to hundredths.

Progression of Strategies, Skills, or Language

Progression	For example . . .
Multiplying a whole number and a decimal less than 1.	12 × 0.02 0.01 □ 12 groups of 2 hundredths □□ □□ □□ □□ □□ □□ □□ □□ □□ □□ □□ □□ $12 \times \frac{2}{100} = \frac{24}{100}$ 12 × 2 hundredths = 24 hundredths 24 hundredths = 0.24
Multiplying a whole number and a decimal greater than 1.	9 × 4.32 = (9 × 4) + (9 × 0.3) + (9 × 0.02) = 36 + 2.7 + 0.18 = 38.88
Representing multiplication of whole numbers by decimals with hundredths models.	7 × 0.38 = **2.66** 
Representing products of decimals with area models.	21.5 × 3.5 20 1 0.5 3: 60 3 1.5 0.5: 10 0.5 0.25 60 + 10 + 3 + 0.5 + 1.5 + 0.25 = 75.25

Unit 4
Lesson
10

Student Edition pages and Presentation Screens support learning in this lesson.


Unit 4 Lesson 10

Exploring Decimal Multiplication

Let's explore multiplying whole numbers and decimals.

Warm-Up

Activity 1 Multiplying Whole Numbers and Decimals

Hands-On

You and your partner will be given a set of base-ten blocks and hundredths models.

Represent each expression using base-ten blocks. Then determine the product. You can use hundredths models to represent your thinking if they are helpful.

Show your thinking.

1 3 × 0.4

answer: _____

Grade 5 Unit 4 Lesson 10 358 Warm-Up | Activity 1

Exploring Decimal Multiplication

Making Sense of Decimal Multiplication

Let's explore multiplying whole numbers and decimals.

Key Concepts

Today's Goals

1. **Goal:** Multiply whole numbers and decimals less than 1 to the hundredths using any representation or strategy.
2. **Language Goal:** Compare different strategies for multiplying a whole number and a decimal to the tenths or hundredths. **(Listening and Speaking)**
   ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students apply their understanding of whole number multiplication to represent and solve multiplication of whole numbers and decimals less than 1. The number cases are limited to decimals that have some tenths *or* some hundredths. Students are encouraged to use any strategy that makes sense to them and are provided with base-ten blocks and hundredths models to use. **(TEKS 5.1.C, 5.1.D, 5.1.E)**

Prior Learning

In Grade 4, students represented the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15.

Future Learning

In Lesson 11, students will use multiple strategies to determine the product of a whole number and decimals greater than and less than 1.

Integrating Rigor in Student Thinking

- Students **apply** their understanding of whole number multiplication to multiply whole numbers and decimals greater than and less than 1.

Vocabulary

Review Vocabulary

decimal

TEKS

Addressing

5.3.D

Represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models.

Also Addressing: **5.3.E**

Math Process Standards: 5.1.C, 5.1.D, 5.1.E

ELPS: 1.B, 1.E, 2.B, 2.C, 2.D, 2.E, 2.F

Building On	Building Toward
4.4.C	6.3.E

Building Math Identity

I am a doer of math.

Why is it helpful to think about how new math ideas connect to ideas you have already explored?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance 60 min

TEKS: 5.1.C, 5.1.D, 5.1.E, 5.3.D, 5.3.E

Warm-Up Fluency

Whole Class | 10 min

Students use the **How Many Do You See?** routine, in which they look at and describe the different ways they see different arrangements of units that represent 1 or 0.1.

Activity 1

Pairs | 35 min

Students use any strategy to multiply whole numbers by a number of tenths or a number of hundredths. They compare different representations and strategies, connecting their work to multiplying whole numbers.

Manipulative Kit: base-ten blocks
Materials: *Hundredths Models* PDF (optional)

Synthesis

Whole Class | 10 min

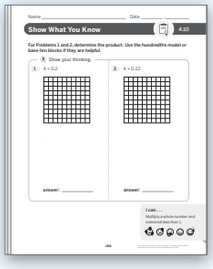
Students review and reflect on the size of products when multiplying a whole number by a decimal less than 1.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by multiplying a whole number and a decimal less than 1.

Manipulative Kit: base-ten blocks (as needed)
Materials: *Show What You Know* PDF



Math Language Development

EB Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

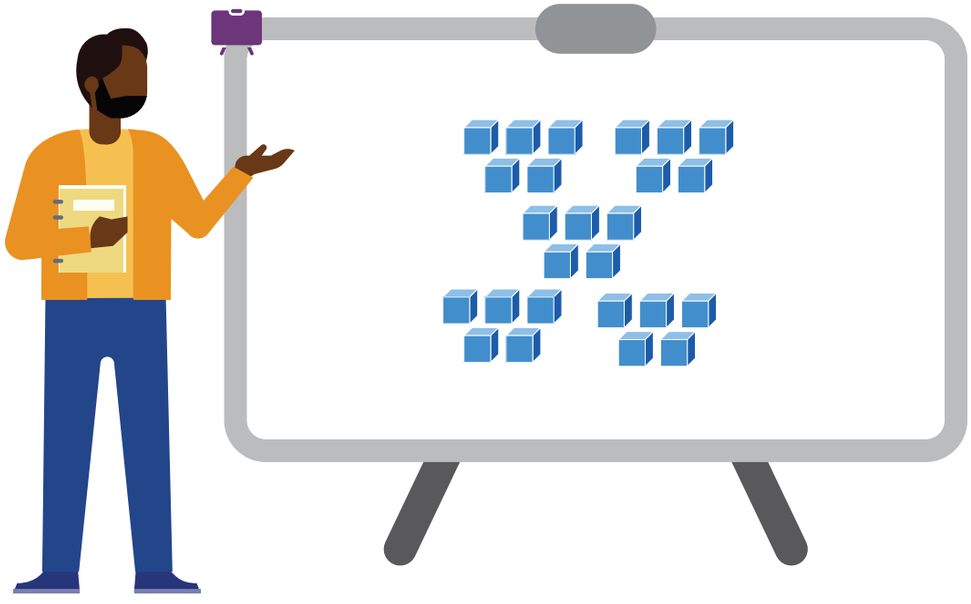
Whole Class | 10 min

Presentation Screen

Warm-Up How Many Do You See?

Fluency

Purpose: Students determine the number of units when the units are arranged in equal-sized groups. This prepares them to explore multiplication with decimals in this lesson.



Why this image? This image lends itself to seeing equal groups as multiplication.

1 Launch

Use the How Many Do You See? routine.

Display the image and ask, "How many do you see? How do you see them?"

2 Connect

Record students' responses as they share, honoring all explanations and keeping responses displayed.

Ask (if not yet mentioned during discussion), "Where do you see multiplication in this image?"

Students might say . . . ELPS 2.C, 2.D

I see 5 groups of 5 ones.

I see 5 groups of 5 hundredths.

Because 5 groups of 5 is 25, I see 25.

I see 25 hundredths because there are 5 groups of 5 hundredths.

Pairs | 35 min

Activity 1 Multiplying Whole Numbers and Decimals

Purpose: Students use base-ten blocks and area models to determine the product of a whole number and a decimal.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the *Hundredths Models* PDF (optional).

Manipulative Kit:

- Provide students with access to 12 base-ten units, one hundreds flat, and 12 tens rods. (optional)

Short on time? Consider completing Problem 5 as a class.

1 Launch

Read aloud the introduction and directions. ELPS 1.E

Ask, "Will the product be greater than or less than the factors? Why does that make sense?"

Say, "Complete Problems 1–5 with your partner. Then join another pair to complete Problem 6."

Provide access to base-ten blocks and the *Hundredths Models* PDF.

A **Accessibility: Visual-spatial processing** Guide visualization by having students begin with modeling the second factor in Problem 1 and drawing a corresponding diagram in their workspace.

2 Monitor

After students have completed **Problem 2**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What does the multiplication expression represent?"
- Ask, "How can you build 3 groups of 0.4 with base-ten blocks?"

3 Connect

MLR This Connect is structured using the *MLR7: Compare and Connect* routine. ELPS 1.B, 1.E, 2.B, 2.D, 2.E

Invite students to share their representations and strategies for Problem 2 using base-ten blocks.

Record students' representations and strategies.

Use the Think-Pair-Share routine. Ask:

- "How are these strategies similar? How are they different?"
- "Did you use the same strategy to solve each problem? Why or why not?"
- "How was your thinking similar to your work with multiplying whole numbers?"

EB **Emergent Bilinguals** Use wait time to allow students to formulate and rehearse their responses, in their own words, before sharing with the class. ELPS 1.E, 2.D, 2.F

Key Takeaway: Say, "When multiplying a whole number and a decimal, 1 way to represent the product is with equal groups using base-ten blocks or a hundredths model. The whole number in the expression can be used to represent the number of equal groups and the decimal can be used to represent the number in each group. Then you can find the total value of the base-ten blocks or the total value shaded on the hundredths model to determine the product."

Student Edition

Unit 4
Lesson
10

Name _____ Date _____

TEKS 5.1.C, 5.1.D, 5.1.E, 5.3.D, 5.3.E

Exploring Decimal Multiplication

Let's explore multiplying whole numbers and decimals.

Warm-Up eyes on teacher

I am a doer of math.
Why is it helpful to think about how new math ideas connect to ideas you have already explored?

Activity 1

Multiplying Whole Numbers and Decimals

Hands-On

You and your partner will be given a set of base-ten blocks and hundredths models.

Represent each expression using base-ten blocks. Then determine the product. You can use hundredths models to represent your thinking if they are helpful. Sample work shown.

Show your thinking.

1 3 × 0.4

4 tenths + 4 tenths + 4 tenths = 12 tenths

answer: 1.2

Activity 1

Name _____ Date _____

Multiplying Whole Numbers and Decimals (continued)

Show your thinking.

2 3 × 0.04

12 hundredths
= 1 tenth + 2 hundredths

answer: 0.12

3 5 × 0.4

$5 \times \frac{4}{10} = \frac{20}{10}$

$\frac{20}{10} = 2$

answer: 2

4 12 × 0.02

12 × 2 hundredths
= 24 hundredths
24 hundredths = 0.24

answer: 0.24

5 At market day, Kara sold 9 miniature unicorns for $0.70 each. How much money did she make from selling miniature unicorns?

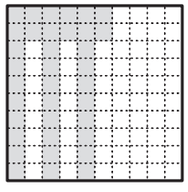
9 × 7 tenths = 63 tenths
63 tenths = 6.3 = $6.30

answer: $6.30

6 Discuss Oral activity: No writing expected.
Join with another pair.
How are your strategies for Problems 1–5 similar? How are they different?

Presentation Screens

D Differentiation | Teacher Moves

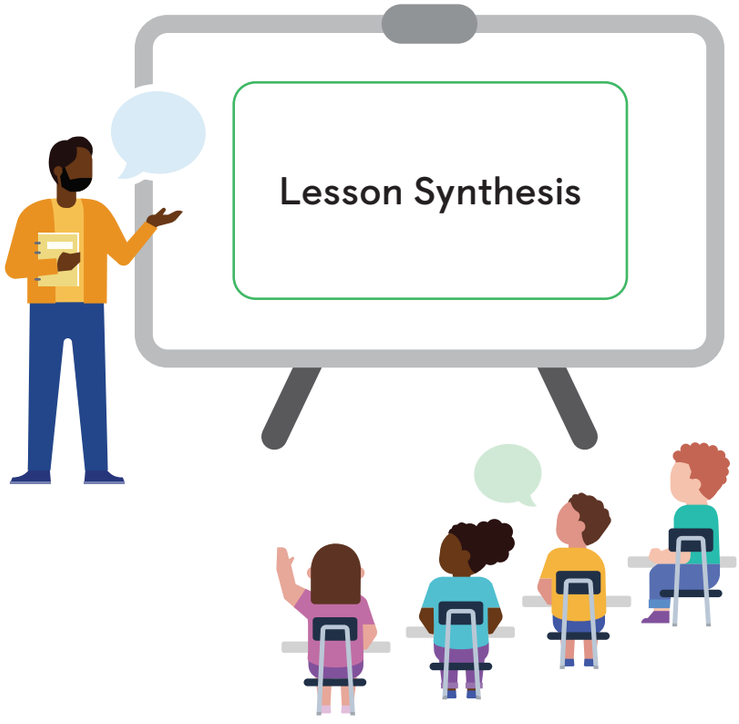
Look for students who . . .	For example . . .	Provide support . . .
Use grids.		**S Strengthen** Ask, "How could you multiply without using a model?"
Use repeated addition.	0.04 + 0.04 + 0.04 = 0.12 or 4 hundredths + 4 hundredths + 4 hundredths = 12 hundredths or 0.12	**S Strengthen** Ask, "Would you use the same strategy when multiplying 14 × 0.03? Why or why not?"
Use fractions.	$3 \times \frac{4}{100} = \frac{12}{100}$ or 0.12	**S Stretch** Ask, "How can you predict whether the product will be greater or less than 1?"
Use whole number facts.	3 × 4 = 12, so 3 × 4 hundredths = 12 hundredths	

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Base-ten blocks and hundredths models can be useful tools for determining the product of a whole number and a decimal.



Say, "Here is an incorrect equation."

Use the Think-Pair-Share routine. Ask, "Why does the product 0.2 not make sense?"

Ask, "How could you use a base-ten blocks or a hundredths model to prove that 0.2 is not 5 times as many as 0.4?"

Say, "Just like when multiplying a whole number and a fraction less than 1, when multiplying a whole number and a decimal less than 1, the product will be less than the whole number and greater than the decimal factor."

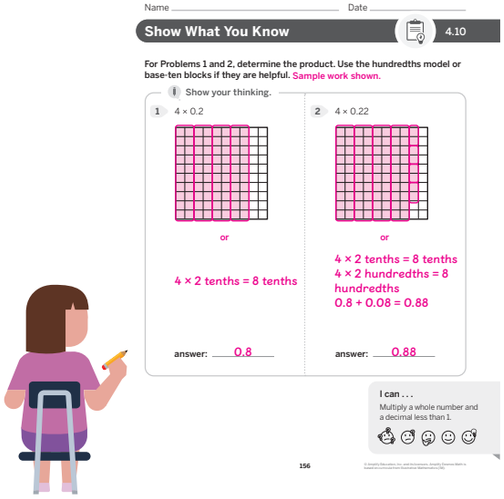
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.10

For Problems 1 and 2, determine the product. Use the hundredths model or base-ten blocks if they are helpful. Sample work shown.

Show your thinking.

1 4 × 0.2

or

4 × 2 tenths = 8 tenths

answer: 0.8

2 4 × 0.22

or

4 × 2 tenths = 8 tenths
4 × 2 hundredths = 8 hundredths
0.8 + 0.08 = 0.88

answer: 0.88

I can . . .
Multiply a whole number and a decimal less than 1.

156

Today's Goals

1. **Goal:** Multiply whole numbers and decimals less than 1 to the hundredths using any representation or strategy.
   - In the *Show What You Know*, students used base-ten blocks, hundredths grids, and/or area models to multiply whole numbers and decimals less than 1.
2. **Language Goal:** Compare different strategies for multiplying a whole number and a decimal to the tenths or hundredths. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

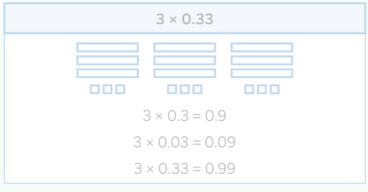
Lesson 10
Practice

Students using digital

Students using print

Summary 4.10

Multiplying with decimals is similar to multiplying with whole numbers. You can use base-ten blocks and models to represent your thinking.



Practice 4.10

For Problems 1 and 2, use the number bank.

Number Bank					
4.0	0.4	0.04	2.4	0.24	24

1 Make the equation true. $\boxed{4.0} \times 0.6 = 2.4$

2 Make the equation true. $0.4 \times 0.6 = \boxed{0.24}$

Grade 5 Unit 4 Lesson 10 360 Summary | Practice

Practice 4.10

Name _____ Date _____

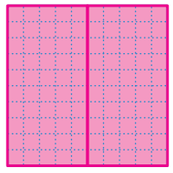
For Problems 3–5, determine the value of the expression. You can use the hundredths model to represent your thinking if it is helpful.
Sample work shown.

Show your thinking.

3 2 × 0.5

2 groups of 5 tenths is 10 tenths, or 1.

or

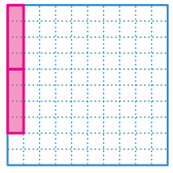


answer: 1

4 2 × 0.04

2 × 4 hundredths = 8 hundredths

or



answer: 0.08

Grade 5 Unit 4 Lesson 10 361 Practice

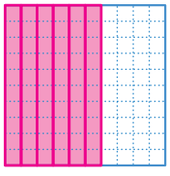
Practice 4.10

Name _____ Date _____

5 6 × 0.1

$6 \times \frac{1}{10} = \frac{6}{10} = 0.6$

or



answer: 0.6

Spiral Review

6 What is the perimeter of a rectangular garden that is $2\frac{1}{2}$ feet by $6\frac{1}{4}$ feet?

Show your thinking.

$2\frac{1}{2} + 2\frac{1}{2} + 6\frac{1}{4} + 6\frac{1}{4} = 5 + 12\frac{2}{4}$
$= 17\frac{2}{4} = 17\frac{1}{2}$

answer: $17\frac{1}{2}$ feet

For Problems 7–10, determine the value of the expression.

7 4 × 4 16

8 2 × 7 14

9 35 ÷ 7 5

10 15 ÷ 5 3

Grade 5 Unit 4 Lesson 10 362 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1, 2	2	5.3.E
	3–5	2	5.3.D, 5.3.E
Spiral Review			
	6	1	5.3.K, 5.4.H
Fluency	7, 8	1	4.4.D
	9, 10	1	4.4.E

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 10

Lesson Goal: Multiply whole numbers and decimals less than 1 to the hundredths using any representation or strategy.

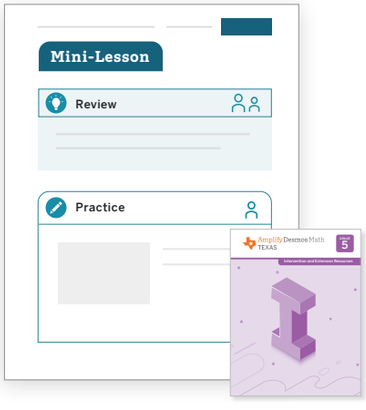
Support

Provide targeted intervention for students by using these resources.

If students multiply whole numbers and decimals using only base-ten blocks:

Respond:

- Assign the *Connecting Whole Number and Decimal Multiplication* **Mini-Lesson. |** 15 min
- Review strategies for multiplying different place values.
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



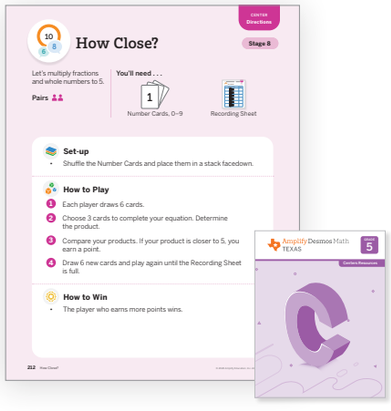
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students multiply whole numbers and decimals using the hundredths model:

Respond:

- Invite students to play this **Center. |** 15 min
  How Close?:
  Multiply to 100
  Multiply to 3,000
  Match It: Multiplication Representations
- Have students complete **Lesson 10 Practice. |** 15 min
- **Item Bank**



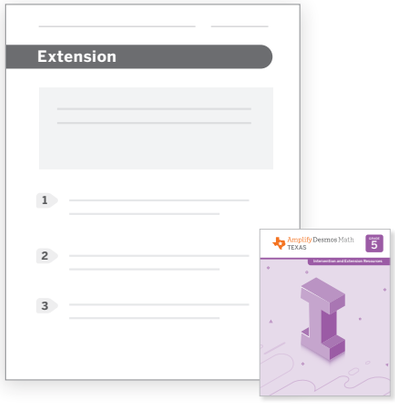
Stretch

Challenge students and extend their learning with these resources.

If students multiply whole numbers and decimals using different strategies or representations:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

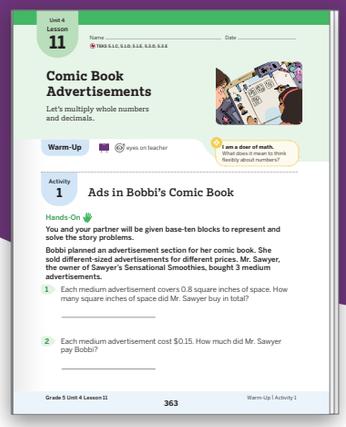
- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

Professional Learning

Identify who has been sharing their ideas in class lately. Make a note of students whose ideas have not been shared and look for an opportunity for them to share their thinking in the next lesson.

Unit 4
Lesson
11

Student Edition pages and Presentation Screens support learning in this lesson.



Comic Book Advertisements

Multiplying Whole Numbers and Decimals Less Than or Greater Than 1

Let's multiply whole numbers and decimals.

Key Concepts

Today's Goals

1. **Goal:** Multiply a whole number and a decimal using place value understanding and properties of operations.
2. **Goal:** Represent multiplication of whole numbers and decimals using base-ten blocks.
3. **Language Goal:** Compare different strategies used to multiply a whole number and a decimal to the hundredths place. **(Listening and Speaking)**
   ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use their understanding of decimal place value and whole number multiplication to solve real-world problems in which a whole number and a decimal to the hundredths place are multiplied. They describe and compare different strategies used to determine products, including the Distributive Property. **(TEKS 5.1.C, 5.1.D, 5.1.E)**

Prior Learning

In Lesson 10, students represented multiplication of decimals with products to the hundredths using objects and pictorial models.

Future Learning

In Lesson 12, students will use hundredths models and place value understanding to make sense of multiplication of 2 decimals less than 1.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of how to multiply a whole number and a decimal to the hundredths.

Vocabulary

Review Vocabulary

decompose	*factor*
Distributive Property	*product*

TEKS

Addressing

5.3.E

Solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers.

Also Addressing: **5.3.D**

Math Process Standards: 5.1.C, 5.1.D, 5.1.E

ELPS: 1.B, 1.E, 1.F, 2.B, 2.C, 2.D, 2.E, 2.F

Building On	Building Toward
5.2.A	**6.4.E**

Building Math Identity

I am a doer of math.

What does it mean to think flexibly about numbers?

Invite students to reflect on this question as they complete this lesson.

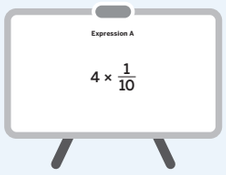
Lesson at a Glance 60 min

TEKS: 5.1.C, 5.1.D, 5.1.E, 5.3.D, 5.3.E

Warm-Up Fluency

Whole Class | 10 min

Students use the **Number Talk** routine, in which they look for structure and use repeated reasoning based on their own previous strategies or the strategies of others as they study a sequence of multiplication expressions.



Activity 1

Pairs | 20 min

Students use their understanding of place value and whole number multiplication to multiply the same whole number and related decimals in an area context. They compare strategies and see that they can use the Distributive Property to multiply with decimals.

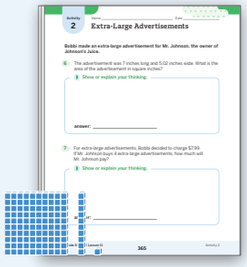
Manipulative Kit: base-ten blocks
Materials: *Hundredths Models* PDF

Activity 2

Pairs | 15 min

Students apply their work from Activity 1 to determine the product of a whole number and a decimal greater than 1. They compare strategies used to determine the amount of space covered by and cost of an advertisement in a comic book.

Manipulative Kit: base-ten blocks
Materials: *Hundredths Models* PDF



Synthesis

Whole Class | 10 min

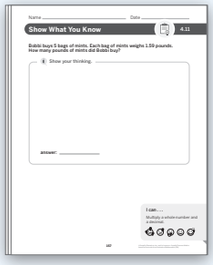
Students review and reflect on the size of a product when multiplying whole numbers and different-sized decimal factors.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by determining the product of a whole number and a decimal to the hundredths.

Manipulative Kit: base-ten blocks (as needed)
Materials: *Hundredths Models* PDF, *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

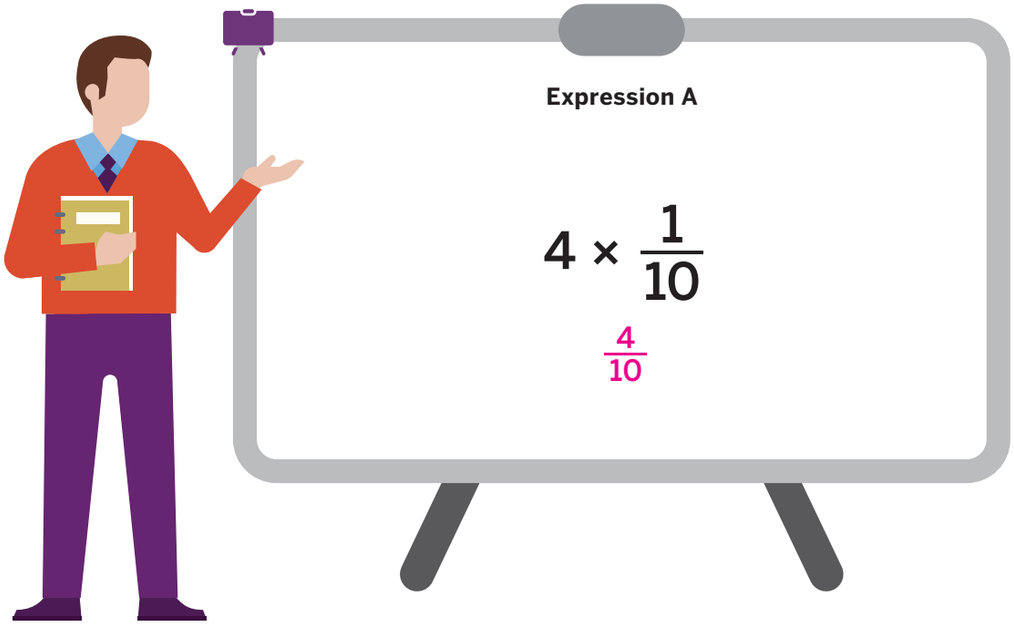
Whole Class | 10 min

Presentation Screen

Warm-Up Number Talk

Fluency

Purpose: Students evaluate multiplication expressions involving a whole number and a fraction less than 1 to develop strategies for multiplying a whole number and a decimal less than 1.



Expression B

$4 \times \frac{2}{10}$

$\frac{8}{10}$

Expression C

$4 \times \frac{1}{100}$

$\frac{4}{100}$

Expression D

$4 \times \frac{2}{100}$

$\frac{8}{100}$

Why these problems? These expressions lend themselves to making connections between fraction multiplication and decimal multiplication.

1 Launch

Use the Number Talk routine.

Display 1 expression at a time.

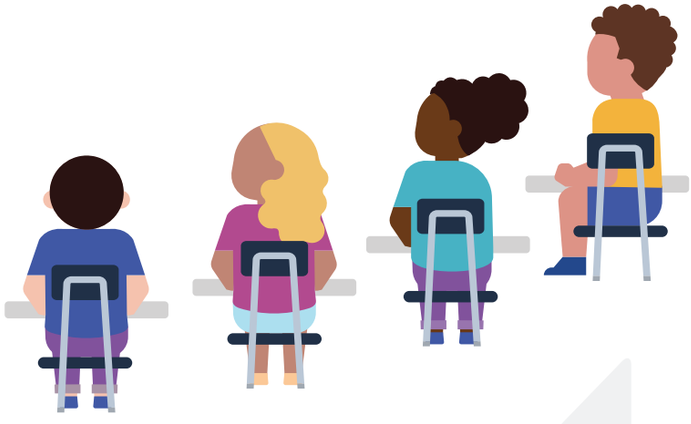
Say, "Take your time to find the value mentally. Give me a signal when you have an answer and can explain how you determined it."

2 Connect

Record products as fractions and as decimals and 2 or 3 strategies as students share, honoring all strategies and keeping expressions and work displayed.

Repeat with each expression, spending the most time discussing Expressions B and D.

Ask (if not yet mentioned during discussion), "How might this thinking be helpful as you multiply with decimals?"



Students might say . . . ELPS 2.C, 2.D, 2.E

A: $\frac{4}{10}$ *because I know that 4 groups of* $\frac{1}{10}$ *is* $\frac{4}{10}$.

B: $\frac{8}{10}$ *because* $\frac{2}{10}$ *is double* $\frac{1}{10}$, *so double* $\frac{4}{10}$ *is* $\frac{8}{10}$.

C: $\frac{4}{100}$ *because 4 × 1 hundredth is 4 hundredths.*

D: $\frac{8}{100}$ *because 4 groups of 2 hundredths is 8 hundredths.*

Pairs | 20 min

Activity 1 Ads in Bobbi's Comic Book

Purpose: Students determine the products of whole number and decimals to consider how the Distributive Property can be used to solve.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the *Hundredths Grids* PDF (as needed).

Manipulative Kit:

- Distribute base-ten blocks to each pair.

Short on time? Consider completing Problem 4 as a class.

1 Launch

Read aloud the introduction. ELPS 1.E

Use the Think-Pair-Share routine. Ask, "How could you represent the size of the advertisement using base-ten blocks?"

Say, "Complete Problems 1–4 with your partner. Then complete Problem 5 with another pair."

A **Accessibility: Conceptual processing** Provide access to the *Hundredths Models* PDF for students who would benefit from representing the problems on grids to make sense of multiplying with a decimal.

2 Monitor

After students have completed **Problem 4**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "How is this problem similar to the problems you solved in the previous lesson? How can that help you get started?"
- Ask, "If the dimensions were 4 inches by 8 inches, how would you determine the area? How can you use that to help you get started?"

3 Connect

Invite pairs to share their responses and strategies for Problem 4. Highlight strategies in which students decompose the decimal into a number of tenths and a number of hundredths and use the distributive property to determine the product. Encourage students to share their thinking using base-ten blocks or area models.

MLR **MLR7: Compare and Connect** ELPS 1.B, 1.E, 2.B, 2.D, 2.E

Record students' strategies. Ask,

- "How are these strategies similar? How are they different?"
- "How is using the Distributive Property to multiply a whole number and a decimal similar to multiplying two whole numbers?"

Record students' strategies.

Key Takeaway: Say, "You can use base-ten blocks and area models to show how you decomposed a decimal into a number of tenths and a number of hundredths. Then you can use the model to explain how you used the Distributive Property to determine the product."

Student Edition

Unit 4 Lesson **11**

Name _____ Date _____

TEKS 5.1.C, 5.1.D, 5.1.E, 5.3.D, 5.3.E

Comic Book Advertisements

Let's multiply whole numbers and decimals.

Warm-Up eyes on teacher

I am a doer of math.
What does it mean to think flexibly about numbers?

Activity **1**

Ads in Bobbi's Comic Book

Hands-On

You and your partner will be given base-ten blocks to represent and solve the story problems.

Bobbi planned an advertisement section for her comic book. She sold different-sized advertisements for different prices. Mr. Sawyer, the owner of Sawyer's Sensational Smoothies, bought 3 medium advertisements.

1 Each medium advertisement covers 0.8 square inches of space. How many square inches of space did Mr. Sawyer buy in total?

2.4 square inches

2 Each medium advertisement cost $0.15. How much did Mr. Sawyer pay Bobbi?

$0.45

Activity **1**

Name _____ Date _____

Ads in Bobbi's Comic Book (continued)

3 Ms. Baker, the owner of Baker's Bakery, bought 3 small advertisements. Each small advertisement cost $0.05. How much did Ms. Baker pay Bobbi?

Show or explain your thinking.

Sample work shown.

3 × 5 hundredths = 15 hundredths

15 hundredths = 0.15

answer: $0.15

4 Ms. Dwyer, the owner of Dwyer's Discount Den, bought 1 large advertisement that is 3 inches long and 0.85 inches wide. What is the area of the large advertisement? Use any strategy to solve.

Sample work shown.

Show or explain your thinking.

	8 tenths	5 hundredths
3	24 tenths	15 hundredths

2.4 + 0.15 = 2.55

answer: 2.55 square inches

5 Discuss Oral activity: No writing expected.

Share and compare your work for Problem 4 with another pair. What is similar? What is different?

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Determine the whole number product.	3 × 85 = 255	**Support** Ask, "What is a reasonable estimate for 3 × 0.85? How does that help you to rethink your product?"
Use an equivalent expression involving a fraction.	$3 \times 0.85 = 3 \times \frac{85}{100}$ $= \frac{255}{100}$ or 2.55	**Strengthen** Ask, "How could you rewrite your equation to represent the individual place values of the 8 and 5?"
Connect their work across problems.	0.85 = 0.8 + 0.05, so the product is 2.4 + 0.15 = 2.55 because it is the sum of the products in Problems 1 and 2.	**Strengthen** Ask, "How could you record all your thinking with 1 equation?"
Use the Distributive Property.	3 × 0.85 = (3 × 0.8) + (3 × 0.05) = 2.4 + 0.15 = 2.55	**Stretch** Ask, "How would your strategy change if you were multiplying 3 × 2.85? Why?"

Pairs | 15 min

Activity 2 Extra-Large Advertisements

Purpose: Students determine the products of whole number and decimals to consider how the Distributive and Associative Properties can be used.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the *Hundredths Grid* PDF (as needed).

Manipulative Kit:

- Distribute base-ten blocks to each pair (as needed).

1 Launch

Read aloud the introduction and Problem 6. ELPS 1.E

Ask, "Will the advertisement cover more or less than 7 square inches on the page? How do you know?"

Say, "Complete Problem 6 independently. Join your partner to complete Problems 7–9."

A **Accessibility: Visual-spatial processing** Guide visualization of Problem 5 by representing the ad with a rectangle and labeling its dimensions.

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together for Problem 5. This will provide a structured opportunity for multilingual learners to interact with and receive feedback from their peers with varied backgrounds. ELPS 1.E, 2.C, 2.D

2 Monitor

After students have completed **Problem 8**, refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How is this problem similar to the problems in Activity 1? How can that help you get started?"
- Ask, "If the dimensions were 9 inches and 432 inches, how would you determine the area? How can you use that thinking for the dimensions 9 inches and 4.32 inches?"

3 Connect

Invite students to share their responses and strategies for Problem 8.

Use the Think-Pair-Share routine. Ask,

- "How are these strategies similar? How are they different?"
- "How is multiplying a whole number and a decimal greater than 1 similar to multiplying a whole number and a decimal less than 1? How is it different?"

Record students' strategies.

Key Takeaway: Say, "When multiplying a whole number and a decimal greater than 1, you can use the Distributive Property just as you did when the decimal was less than 1. When a decimal is greater than 1, you can decompose the number into a whole number, a number of tenths and a number of hundredths and multiply the parts separately."

Student Edition

Activity 2

Name _____ Date _____

Extra-Large Advertisements

Bobbi made an extra-large advertisement for Mr. Johnson, the owner of Johnson's Juice.

6 The advertisement was 7 inches long and 5.02 inches wide. What is the area of the advertisement in square inches? Sample work shown.

Show or explain your thinking.

	5 ones	2 hundredths
7	35 ones	14 hundredths

35 + 0.14 = 35.14

answer: 35.14 square inches

7 For extra-large advertisements, Bobbi decided to charge $7.99. If Mr. Johnson buys 4 extra-large advertisements, how much will Mr. Johnson pay? Sample work shown.

Show or explain your thinking.

4 × 7.99 = (4 × 7) + (4 × 0.9) + (4 × 0.09)
= 28 + 3.6 + 0.36 = 31.6 + 0.36
= 31.96

answer: $31.96

Activity 2

Name _____ Date _____

Extra-Large Advertisements (continued)

Bobbi made an extra-large advertisement for Mr. Frost, the owner of Frost's Frosties.

8 The advertisement was 9 inches long and 4.32 inches wide. What is the area of the advertisement in square inches? Sample work shown.

Show or explain your thinking.

9 × 4.32 = (9 × 4) + (9 × 0.3) + (9 × 0.02)
= 36 + 2.7 + 0.18
= 38.88

answer: 38.88 square inches

9 Discuss

Share and compare your work with your partner. What is similar? What is different?

Oral activity: No writing expected. Sample response shown.

We both multiplied 9 × 4.32. I decomposed 4.32 by place value and multiplied each part by 9. My partner multiplied 9 × 432 and then multiplied by 0.01.

Presentation Screens

D Differentiation | Teacher Moves

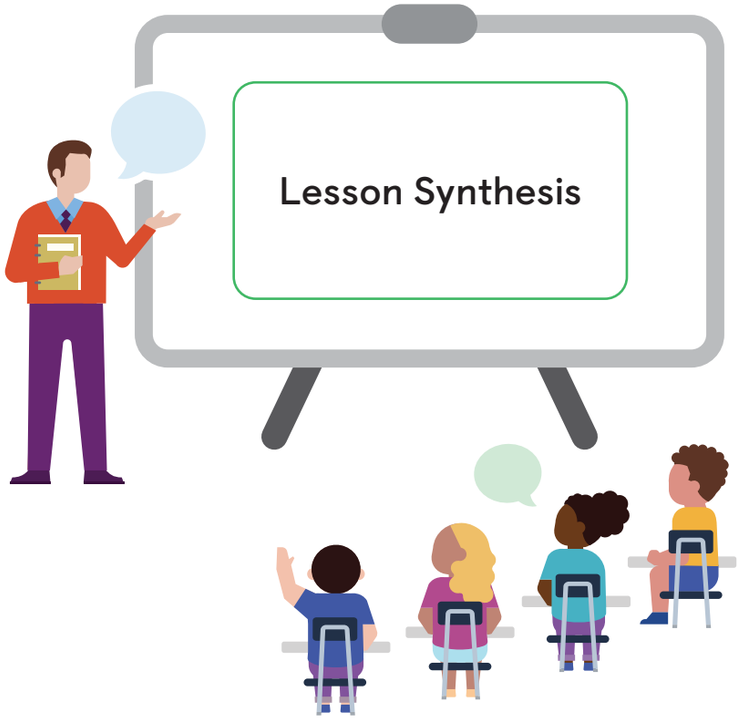
Look for students who . . .	For example . . .	Provide support . . .
Almost there Determine the whole number product.	9 × 432 = 3,888	**Support** Ask, "What is a reasonable estimate for 9 × 4.32? How does that help you rethink your product?"
Use the Distributive Property.	(9 × 4) + (9 × 0.3) + (9 × 0.02) = 36 + 2.7 + 0.18 = 38.88	**Strengthen** Ask, "How could you evaluate this expression by multiplying only once?"
Use whole number and place value reasoning.	9 × 432 = 3,888 3,888 hundredths = 38.88	**Stretch** Ask, "How would your strategy change if you were multiplying 9 × 43.2? Why?"
Use the associative property.	9 × 4.32 = (9 × 432) × 0.01	

Whole Class | 10 min

Presentation Screen

Synthesis

Lesson Takeaway: Base-ten blocks and area models are useful tools for determining the product of a whole number and a decimal using the Distributive Property.



Say, "Here is the equation from Problem 7."

Ask, "What do you notice about the size of the product? How could you use base-ten blocks or the area model to explain why that makes sense? How can you use the context of money in the story problem to explain why the product makes sense?"

Play the animation. ELPS 1.F

Say, "Just like when multiplying with fractions, when you multiply a whole number and a decimal greater than 1, the product is greater than both factors."

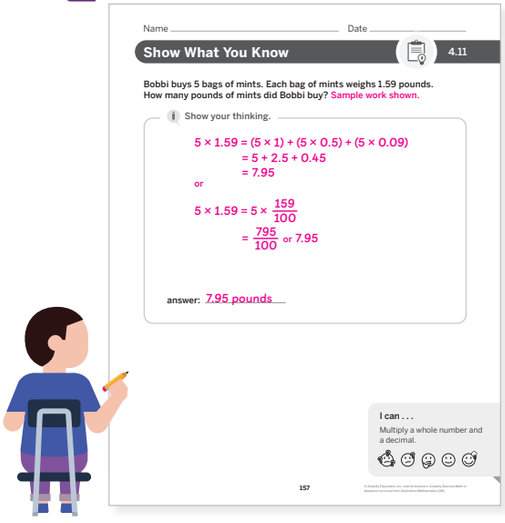
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.11

Bobbi buys 5 bags of mints. Each bag of mints weighs 1.59 pounds. How many pounds of mints did Bobbi buy? Sample work shown.

Show your thinking.

$5 \times 1.59 = (5 \times 1) + (5 \times 0.5) + (5 \times 0.09)$
$= 5 + 2.5 + 0.45$
$= 7.95$

or

$5 \times 1.59 = 5 \times \frac{159}{100}$
$= \frac{795}{100}$ or 7.95

answer: 7.95 pounds

I can . . .
Multiply a whole number and a decimal.

157

Today's Goals

1. **Goal:** Multiply a whole number and a decimal using place value understanding and properties of operations.
   - In the *Show What You Know*, students multiplied a whole number by a decimal.
2. **Goal:** Represent multiplication of whole numbers and decimals using base-ten blocks.
3. **Language Goal:** Compare different strategies used to multiply a whole number and a decimal to the hundredths place. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 11
Practice

Students using digital

Students using print

Summary 4.11

You can use familiar strategies, including the associative and Distributive Properties, to multiply a whole number and a decimal.

5×0.53

Whole numbers	5×53
Associative property	$(5 \times 53) \times 0.01$
Distributive Property	$(5 \times 0.5) + (5 \times 0.03)$

Practice 4.11

1 Match each expression with its product.

Expression	Product
a. 4×0.7	b 8.28
b. 4×2.07	d 4.08
c. 4×0.12	a 2.8
d. 4×1.02	c 0.48

Grade 5 Unit 4 Lesson 11 367 Summary | Practice

Practice 4.11

Name _____ Date _____

2 The table shows expressions and corresponding values. Determine if each expression represents the value.
Select **THREE** correct answers.

Expression	Value
● 8×0.9	7.2
○ 6×0.02	4.8
● 2×3.15	6.3
○ 7×0.3	0.21
● 9×1.1	9.9

3 Priya found 12 nickels while walking around her neighborhood. How much money did Priya find? Sample work shown.

Show or explain your thinking.

12×0.05
12×5 hundredths $= 60$ hundredths
$= 0.60$

answer: $0.60

4 5 cats each weigh 6.31 pounds. How much do the cats weigh in all?

Show or explain your thinking.

Sample work shown.

$5 \times 6.31 = 5 \times \frac{631}{100}$

$= \frac{3,155}{100}$ or 31.55

answer: 31.55 pounds

Grade 5 Unit 4 Lesson 11 368 Practice

Practice 4.11

Name _____ Date _____

Spiral Review

5 Determine the product 532×87 using the standard algorithm.

Show your thinking.

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ {\scriptstyle 2\ 1} \\ 532 \\ \times\ \ 87 \\ \hline 3,724 \\ +\ 42,560 \\ \hline 46,284 \end{array}$$

answer: 46,284

For Problems 6–13, determine the value of the expression.

6 9×8 72

7 7×11 77

8 4×9 36

9 8×4 32

10 $50 \div 5$ 10

11 $11 \div 11$ 1

12 $35 \div 7$ 5

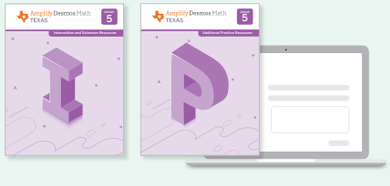
13 $88 \div 11$ 8

Grade 5 Unit 4 Lesson 11 369 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.3.E
Test Practice	2	2	5.3.E
	3, 4	2	5.3.D, 5.3.E
Spiral Review			
Fluency	5	1	5.3.B
	6–9	1	4.4.D
	10–13	1	4.4.E, 5.3.C

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 11

Lesson Goal: Multiply a whole number and a decimal using place value understanding and properties of operations.

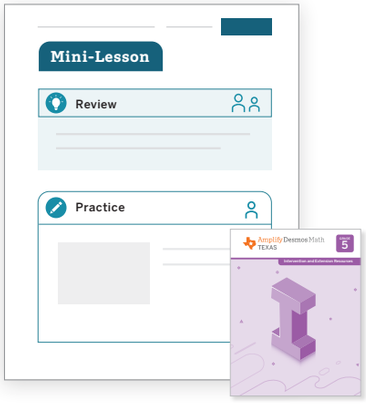
Support

Provide targeted intervention for students by using these resources.

If students represent the product as a whole number:

Respond:

- Assign the *Multiplying Decimals by Whole Numbers* **Mini-Lesson.** | 15 min
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



Strengthen

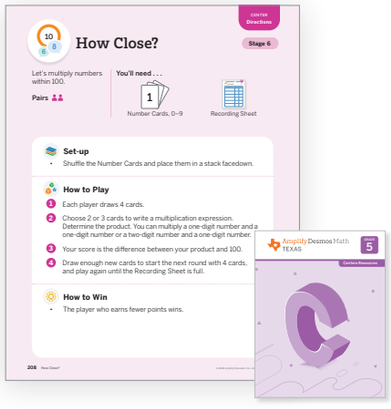
Reinforce students' understanding of the concepts assessed by using these resources.

If students multiply a whole number and a decimal using base-ten blocks or area models:

Respond:

- Invite students to play these **Centers.** | 15 min
  How Close:
  - *Multiply to 100*
  - *Multiply to 3,000*

  Match It: Multiplication Representations
- Have students complete **Lesson 11 Practice.** | 15 min
- **Item Bank**



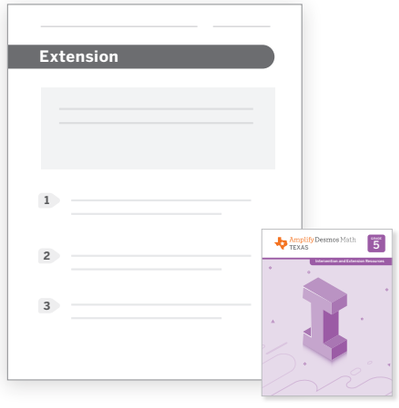
Stretch

Challenge students and extend their learning with these resources.

If students multiply a whole number and a decimal using the Distributive Property:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities.** | 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

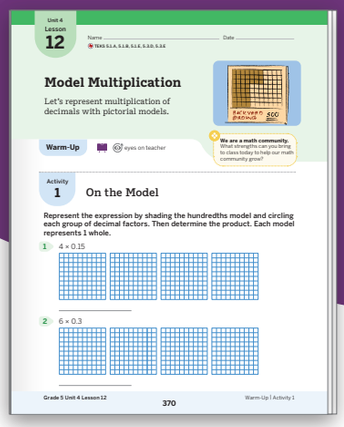
- English/Spanish cognates
- Frayer model templates
- Vocabulary routines

Professional Learning

What connections did students make between the different strategies shared? What questions did you ask to help make the connections more visible?

Unit 4
Lesson
12

Student Edition pages and Presentation Screens support learning in this lesson.



Model Multiplication

Representing Multiplication of Decimals With Pictorial Models

Let's represent multiplication of decimals with pictorial models.

Key Concepts

Today's Goals

1. **Goal:** Represent multiplication of decimals using pictorial models.
2. **Goal:** Solve real-world story problems involving products of decimals to the hundredths using strategies based on place value.
3. **Language Goal:** Explain how representations can be used to identify the product of a whole number and a decimal to the hundredths. **(Listening, Speaking, and Reading)** ELPS 1.E, 2.E, 2.F, 3.H

Connections and Coherence

Students use hundredths models to multiply whole numbers by decimals, including within story problems involving money. They then analyze a hundredths model that represents the product of 2 decimal factors and conclude through peer discussion that the product can be determined by examining where the factors overlap on the hundredths model. Students discover that hundredths models are a useful tool for multiplying and how factors are represented on hundredths models differs depending on the place value of each factor. **(TEKS 5.1.A, 5.1.B, 5.1.E)**

Prior Learning

In Lesson 11, students multiplied whole numbers and decimals using strategies based on place value

Future Learning

In Lesson 13, students will represent and solve for products of decimals using area models.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of representing multiplication of whole numbers and decimals and decimals and decimals using pictorial models.

Vocabulary

Review Vocabulary

factor

product

TEKS

Addressing

5.3.D

Represent multiplication of decimals with products to the hundredths using pictorial models, including area models.

Also Addressing: **5.3.E**

Math Process Standards: 5.1.A, 5.1.B, 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.A, 3.E, 3.G, 3.H

Building On	Building Toward
5.2.A	6.4.G

Building Math Identity

We are a math community.
What strengths can you bring to class today to help our math community grow?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance 60 min

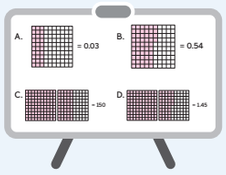
TEKS: 5.1.A, 5.1.B, 5.1.E, 5.1.F, 5.1.G, 5.3.D, 5.3.E

Warm-Up Fluency

Whole Class | 10 min

Students use the **True or False?** routine to determine whether a series of whole number and decimal multiplication equations are true or false and justify their reasoning. They have the opportunity to reason using strategies that may include place value.

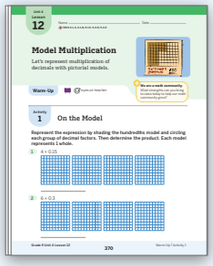
(TEKS 5.1.F, 5.1.G)



Activity 1

Pairs | 15 min

Students use hundredths models to determine the products of whole numbers and decimals, including real-world story problems. They determine that the whole number factor represents the number of groups, and the decimal factor represents the amount in each group.

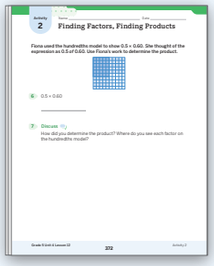


Activity 2

Pairs | 20 min

Students analyze a completed hundredths model to discover that, when multiplying 2 decimals, the product can be found where the factors overlap. They apply this strategy to determine the products of problems involving the multiplication of 2 decimals.

Materials: colored pencils (as needed)



Synthesis

Whole Class | 10 min

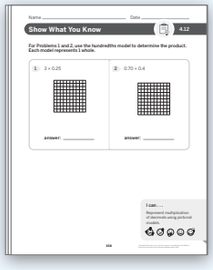
Students review and reflect on what they know about representing whole number and decimal and decimal and decimal multiplication.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by representing the multiplication of decimals and whole numbers and decimals and decimals using pictorial models.

Materials: *Show What You Know* PDF, colored pencils (as needed)



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F, 3.C, 3.F

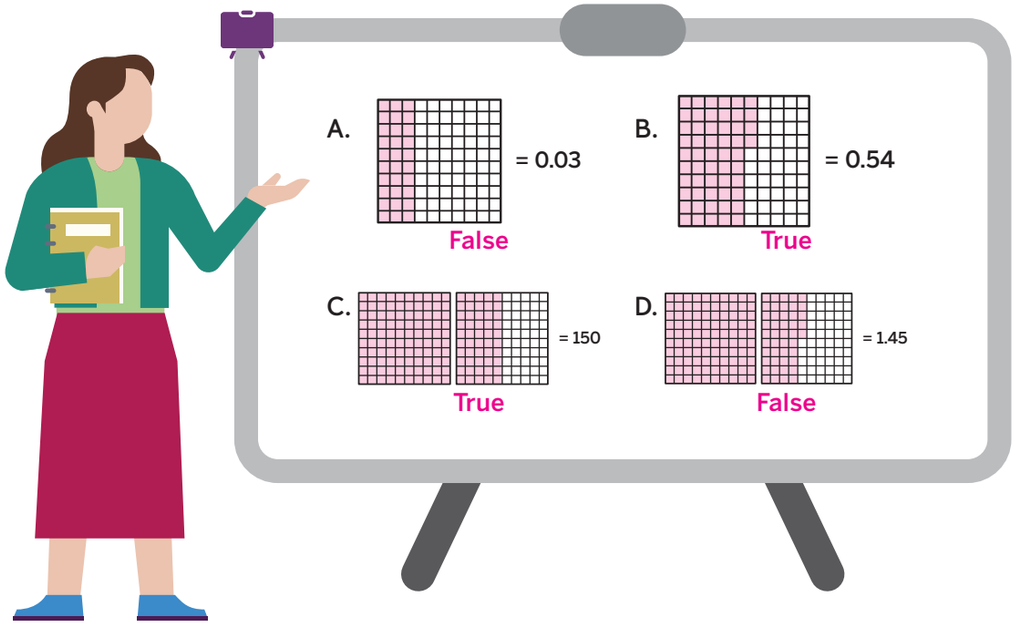
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to and **read** English. They **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screen

Warm-Up True or False? Fluency

Purpose: Students analyze representations of decimals to develop fluency with determining products involving decimals on a hundredths model.



Why these problems? These problems lend themselves to having students use place value and mental math strategies to support their representations in Activity 1.

1 Launch

Use the True or False? routine.

Display 1 representation at a time.

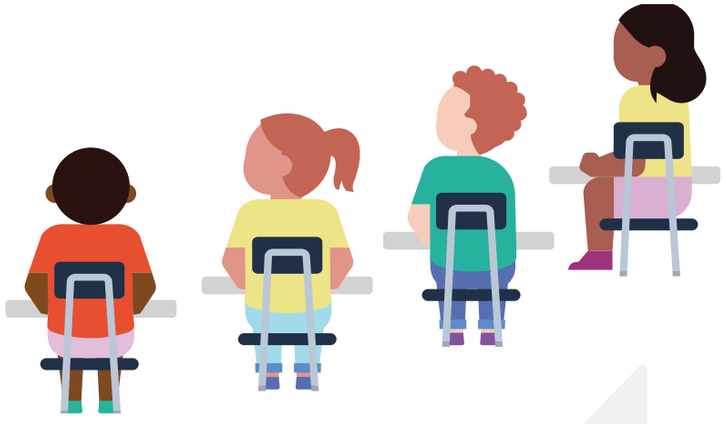
Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

Record 2 or 3 students' responses, asking for their reasoning and allowing others to agree or disagree. Keep each representation displayed as you progress to the next.

Repeat with each equation.

Use the Think-Pair-Share routine. Ask, "How can you use place value understanding to check your work and revise your thinking throughout today's lesson?"



Students might say . . . ELPS 2.B, 2.C, 2.D, 2.E

A: False. One column is 10 hundredths, or 1 tenth. 3 are shaded, so the answer is 3 tenths.

B: True. 5 tenths and 4 hundredths are shaded.

C: False. 1 whole grid is shaded, which is 1. Half of the second grid is shaded. 1.5 is represented.

D: True. 1 whole plus 45 hundredths is 1.45.

Pairs | 15 min

Activity 1 On the Model

Purpose: Students use hundredths models to represent the products of whole numbers and decimals to build an understanding of decimal multiplication strategies.

Presentation Screens

Short on time? Consider completing Problem 5 as a whole class.

1 Launch

Read aloud the directions.

Say, "Work with your partner to solve Problems 1–5."

A **Accessibility: Executive functioning** Check for understanding by inviting students to rephrase the directions in their own words, clarifying as needed.

2 Monitor

While students complete **Problem 1,** refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What is your first step?"
- Ask, "Where do you see 1 group of 15 hundredths? Where is the next group of 15 hundredths?"

EB **Emergent Bilinguals** Encourage students to ask for help as needed using sentence frames such as "I need help with _____." or "I don't understand _____." ELPS 3.A, 3.E

3 Connect

Invite students to share their responses and strategies for Problem 1.

Use the Think-Pair-Share routine. Ask:

- "What do you notice about the product?"
- "How is multiplying whole numbers by decimals similar to multiplying whole numbers by whole numbers?"
- "How is it different?"

Key Takeaway: Say, "You can represent the product of a whole number and a decimal by representing the whole number as the number of groups and the decimal as the amount in each group. Then you can determine the product by calculating the total amount in the groups altogether."

Student Edition

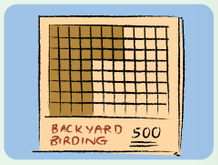
Unit 4
Lesson
12

Name _____ Date _____

TEKS 5.1.A, 5.1.B, 5.1.E, 5.3.D, 5.3.E

Model Multiplication

Let's represent multiplication of decimals with pictorial models.



Warm-Up eyes on teacher

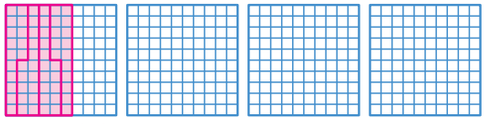
We are a math community. What strengths can you bring to class today to help our math community grow?

Activity 1

On the Model

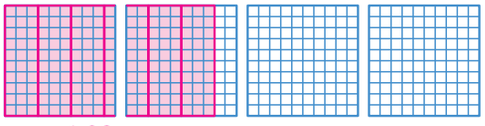
Represent the expression by shading the hundredths model and circling each group of decimal factors. Then determine the product. Each model represents 1 whole. Sample work shown.

1 4 × 0.15



0.6

2 6 × 0.3



1.80

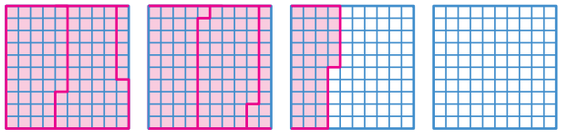
Grade 5 Unit 4 Lesson 12 370 Warm-Up | Activity 1

Activity 1

Name _____ Date _____

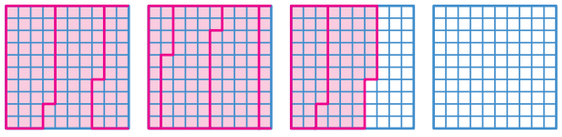
On the Model (continued)

3 5 × 0.47



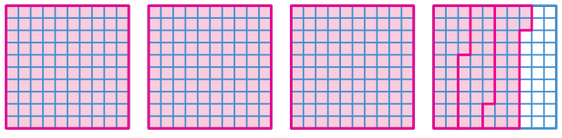
2.35

4 Miguel bought 7 price tags for his scarves. Each price tag cost $0.38. How much money did he spend on the price tags?



$2.66

5 Jonathan bought 3 puzzle boxes for his puzzles. Each box cost $1.24. What is the total cost of the puzzle boxes?

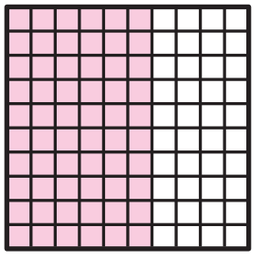
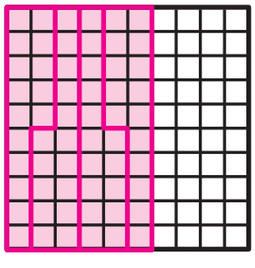


$3.72

Grade 5 Unit 4 Lesson 12 371 Activity 1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the product as a whole number.	 4 × 0.15 = 6	**S Support** Ask, "How many groups are represented? What is the amount represented in each group? How can you use place value understanding to help you determine the size of the product?"
Represent the product as tenths or hundredths.	 4 × 0.15 = 0.6 or 0.60	**S Stretch** Ask, "How would your representation change if the place value of the decimal factor was 1.5? How do you know?"

Pairs | 20 min

Activity 2 Finding Factors, Finding Products

Purpose: Students use hundredths models to represent the products of whole numbers and decimals to build an understanding of decimal multiplication strategies.

Presentation Screens

Materials

Classroom materials:

- Provide students with access to two different colored pencils (as needed).

1 Launch

Read aloud the directions for Problem 6.

Say, "Work with your partner to complete Problems 6–11."

A **Accessibility: Visual-spatial processing** Suggest students use a different colored pencil to represent each factor as they shade the hundredths models. Be sure to model this strategy for students before they begin Problem 8.

EB **Emergent Bilinguals** Invite students to share what they know about the term *overlap* to increase access to the task. ELPS 3.E

2 Monitor

After students have completed **Problem 9,** refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How can you represent each factor on the hundredths model?"
- Ask, "Where do you see the factors overlap? What is represented by the overlap?"

3 Connect

MLR **MLR3: Critique, Correct, Clarify** ELPS 2.B, 2.D, 2.E, 3.E, 3.G

Display an incorrect representation for Problem 9. Ask:

- *Critique:* "What might this person be trying to show on the hundredths model? How do you know?"
- *Correct:* "What could you add or change to make their representation true?"
- *Clarify:* "What could you add or change to make their representation easier to understand?"

Key Takeaway: Say, "You can represent the product of 2 decimals by shading each decimal in opposite directions on a hundredths model. Then you can determine the product by calculating the number of shaded hundredths that overlap."

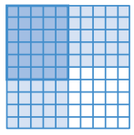
Student Edition

Activity 2

Name _____ Date _____

Finding Factors, Finding Products

Fiona used the hundredths model to show 0.5 × 0.60. She thought of the expression as 0.5 *of* 0.60. Use Fiona's work to determine the product.



6 0.5 × 0.60

0.30

7 **Discuss**

How did you determine the product? Where do you see each factor on the hundredths model?

Oral activity: No writing expected. Sample response shown.

I determined the product by looking at the darkest part of the model, where the factors overlap. Fiona also outlined the darker part. I see 0.6 going up on the left and 0.50 going across the top.

Activity 2

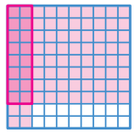
Name _____ Date _____

Finding Factors, Finding Products (continued)

Shade each factor to determine the product. Each model represents 1 whole. Sample work shown.

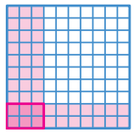
Show your thinking.

8 0.8 × 0.2



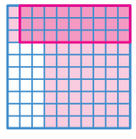
answer: 0.16

9 0.20 × 0.3



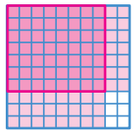
answer: 0.06

10 0.3 × 0.9



answer: 0.27

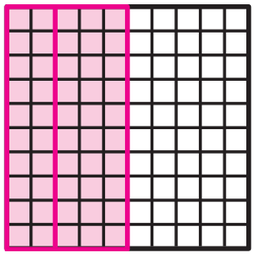
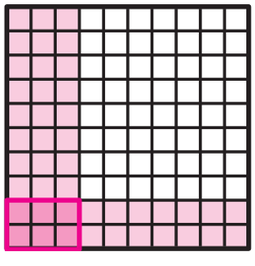
11 0.7 × 0.80



answer: 0.56

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Shade each factor side by side and add to determine the product.		**Support** Ask, "In Problem 6, Fiona shaded each factor in opposite directions. Why did Fiona choose to shade each factor in opposite directions? How can you revise your hundredths model to reflect Fiona's strategy for solving?"
Shade each factor in opposite directions to determine the product, using the section of the hundredths model where the factors overlap.		**Stretch** Ask, "Would your representation change if the problem was 0.20 × 1.3? Why or why not?"

Whole Class | 10 min

Presentation Screen

Synthesis

Lesson Takeaway: When multiplying a whole number by a decimal and a decimal by a decimal, representing the factors on a hundredths model can be helpful for determining the product.

Display the Synthesis Screen.

Use the Think-Pair-Share routine. Ask, "Where do you see each factor in the representation? How does the representation show 2 tenths of 4 tenths? How does the representation show 4 tenths of 2 tenths?"

Say, "Hundredths models can be used to solve multiplication problems involving decimals. When both factors are decimals, you can shade the factors in opposite directions and circle where the factors overlap to determine the product."

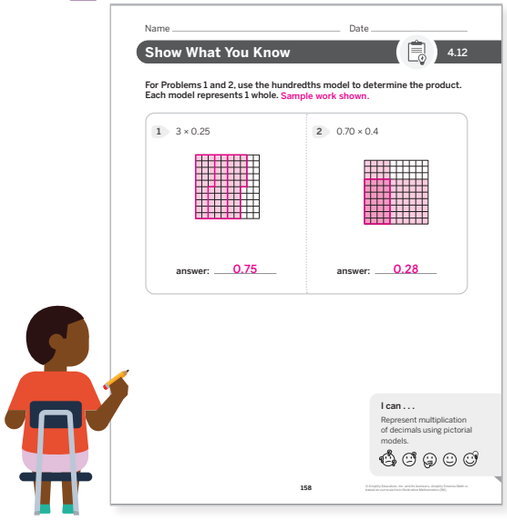
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.12

For Problems 1 and 2, use the hundredths model to determine the product. Each model represents 1 whole. Sample work shown.

1 3 × 0.25

answer: 0.75

2 0.70 × 0.4

answer: 0.28

I can . . .
Represent multiplication of decimals using pictorial models.

158

Today's Goals

1. **Goal:** Represent multiplication decimals using pictorial models.
   - In the *Show What You Know*, students used pictorial models to represent multiplication of decimals.
2. **Goal:** Solve real-world story problems involving products of decimals to the hundredths using strategies based on place value.
3. **Language Goal:** Explain how a representation can be used to identify the product of a whole number and a decimal to the hundredths. **(Listening, Speaking, and Reading)**
   ELPS 1.E, 2.E, 2.F, 3.H

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 12
Practice

Students using digital

Students using print

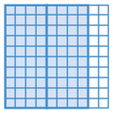
Summary 4.12

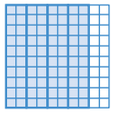
When multiplying a whole number by a decimal and a decimal by a decimal, representing the factors on a hundredths model can be helpful for determining the product.

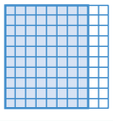
2 × 0.40 = 0.80	0.2 × 0.40 = 0.08

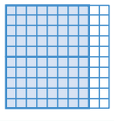
Practice 4.12

1 Diego bought 4 apples that cost $0.20 each. Which model could you use to determine the cost of the apples?

(A) 

(B) 

(C) 

(D) 

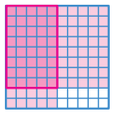
Practice 4.12

Name _____ Date _____

For Problems 2–5, use the hundredths model to determine the product. Each model represents 1 whole. Sample work shown.

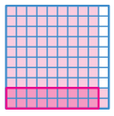
Show your thinking.

2 0.50 × 0.8



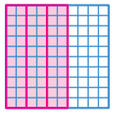
answer: 0.40

3 0.9 × 0.2



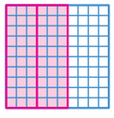
answer: 0.18

4 3 × 0.20



answer: 0.60

5 2 × 0.30

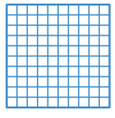


answer: 0.60

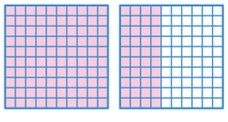
Practice 4.12

Name _____ Date _____

6 The rectangle represents 1 whole.



Represent the product of 0.35 and 4 by shading the model.



Spiral Review

For Problems 7 and 8, use the standard algorithm to determine the quotient.

Show your thinking.

7 345 ÷ 23

$$\begin{array}{r} 15 \\ 23\overline{)345} \\ -23 \\ \hline 115 \\ -115 \\ \hline 0 \end{array}$$

answer: 15

8 264 ÷ 12

$$\begin{array}{r} 22 \\ 12\overline{)264} \\ -24 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

answer: 22

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	2	5.3.D, 5.3.E
	2–5	2	5.3.D
Test Practice	6	2	5.3.D
Spiral Review			
Fluency	7, 8	1	5.3.C

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 12

Lesson Goal: Represent multiplication of decimals using pictorial models.

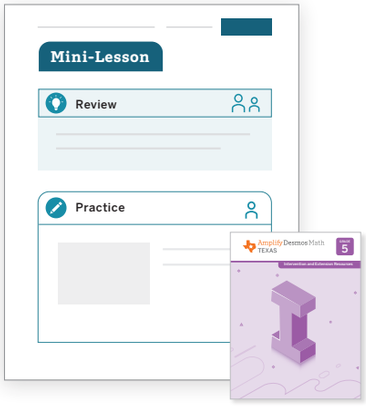
Support

Provide targeted intervention for students by using these resources.

If students inaccurately represent one or both factors on the hundredths models:

Respond:

- Assign the *Multiplying Decimals Less Than 1* **Mini-Lesson. |** 15 min
- Invite students to discuss the difference between representing whole number and decimal, and decimal and decimal multiplication using hundredths models with a partner.



Strengthen

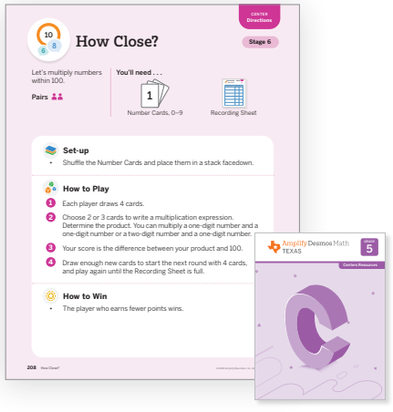
Reinforce students' understanding of the concepts assessed by using these resources.

If students determine the product by representing each factor on the hundredths models:

Respond:

- Invite students to play these **Centers. |** 15 min
  How Close?:
  - *Multiply to 100*
  - *Multiply to 3,000*

  Match It: Multiplication Representations
- Have students complete **Lesson 12 Practice. |** 15 min
- **Item Bank**



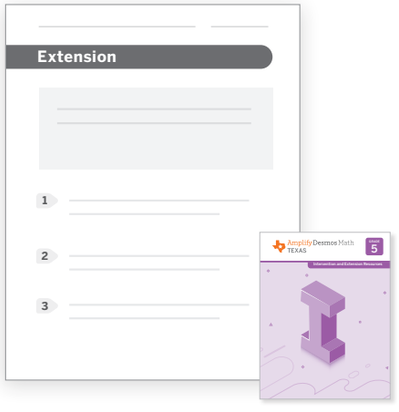
Stretch

Challenge students and extend their learning with these resources.

If students determine the product without representing each factor on the hundredths model:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the **Differentiation: Teacher Moves** table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates
- Frayer Model templates
- Vocabulary routines

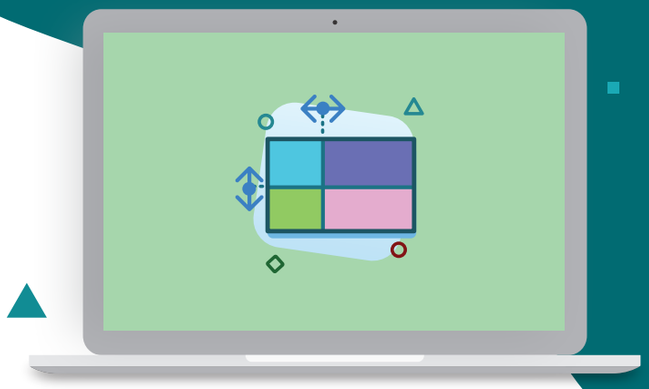
Professional Learning

Did any students surprise you with any insights or ideas during today's lesson? How did you amplify their ideas to benefit all learners in the classroom?

Unit 4
Lesson
13

Student devices recommended

We recommend students use devices for this lesson. Student Edition pages are also available.



Decimals, Models, and Decompositions

Representing Multiplication of Decimals With Area Models

Let's represent and solve multiplication of decimals.

Key Concepts

Today's Goals

1. **Goal:** Determine the product of 2 decimals using area models, place value, and whole-number multiplication strategies.
2. **Language Goal:** Explain how to reason about the placement of the decimal point when multiplying 2 decimals. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students apply their work multiplying 2 decimals less than 1 to multiply 2 decimals greater than 1. They use area models and properties of operations to decompose 1 or both factors, and they consider and explain how to use whole number multiplication and place value to reason about the placement of the decimal point in the product. **(TEKS 5.1.E, 5.1.F, 5.1.G)**

Prior Learning

In Lesson 12, students represented multiplication of decimals using pictorial models. They also solved real-world story problems using strategies based on place value.

Future Learning

In Sub-Unit 3, students will represent and solve for quotients of decimals to the hundredths.

Depth and Rigor of Student Thinking

- Students continue to build their **conceptual understanding** of decimal multiplication by multiplying 2 decimals.
- Students build **procedural skills** for multiplying with decimals by determining the products of 2 decimals using place value strategies.

Vocabulary

Review Vocabulary

area model

Distributive Property

product

TEKS

Addressing

5.3.D

Represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models.

Also Addressing: **5.3.E**

Math Process Standards: 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.D, 2.E, 2.F

Building On	Building Toward
5.2.A	**6.3.E**
5.3.I	

Building Math Identity

I am a doer of math.

How do you decide which strategy to use when starting a math problem?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

60 min

TEKS: 5.1.E, 5.1.F, 5.1.G, 5.3.D, 5.3.E

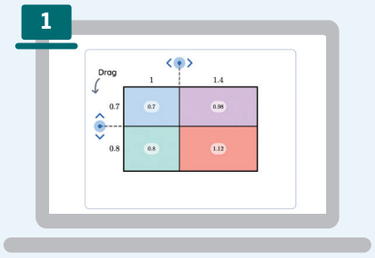
Why digital?

Students use area models to determine the products of 2 decimals and receive responsive feedback in real time.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about different ways to decompose 1 or both decimal factors using an area model.

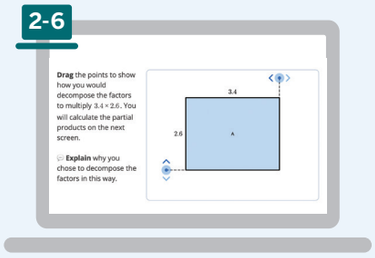


Activity 1

Pairs | 20 min

Students use area models to multiply 2 decimal factors greater than 1. They see that, just like with whole number multiplication, they can decompose 1 or both factors in any way, though decomposing by place value is most helpful.

Note: The Student Edition is not required for this activity.

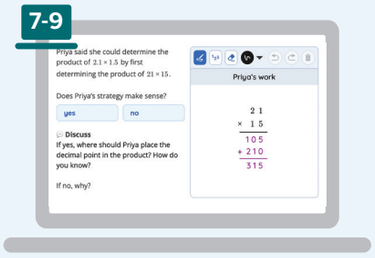


Activity 2

Pairs | 15 min

Students consider how to use whole number multiplication to determine the product of 2 decimals. They see that they can use place value reasoning to place the decimal point in the product of 2 decimals.

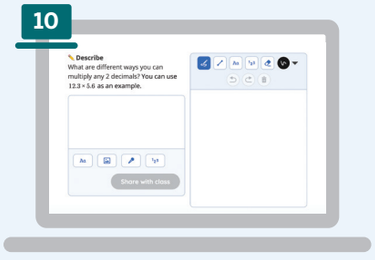
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on strategies they can use to multiply 2 decimals.

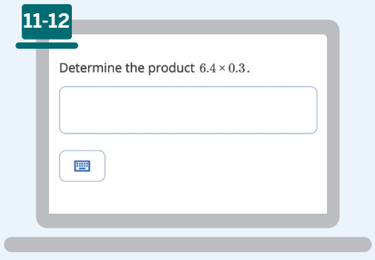


Show What You Know

Independent | 5 min

Students demonstrate their understanding by determining the product of 2 decimals.

Students using print: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

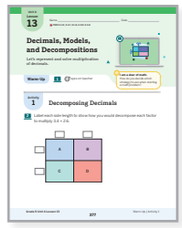
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

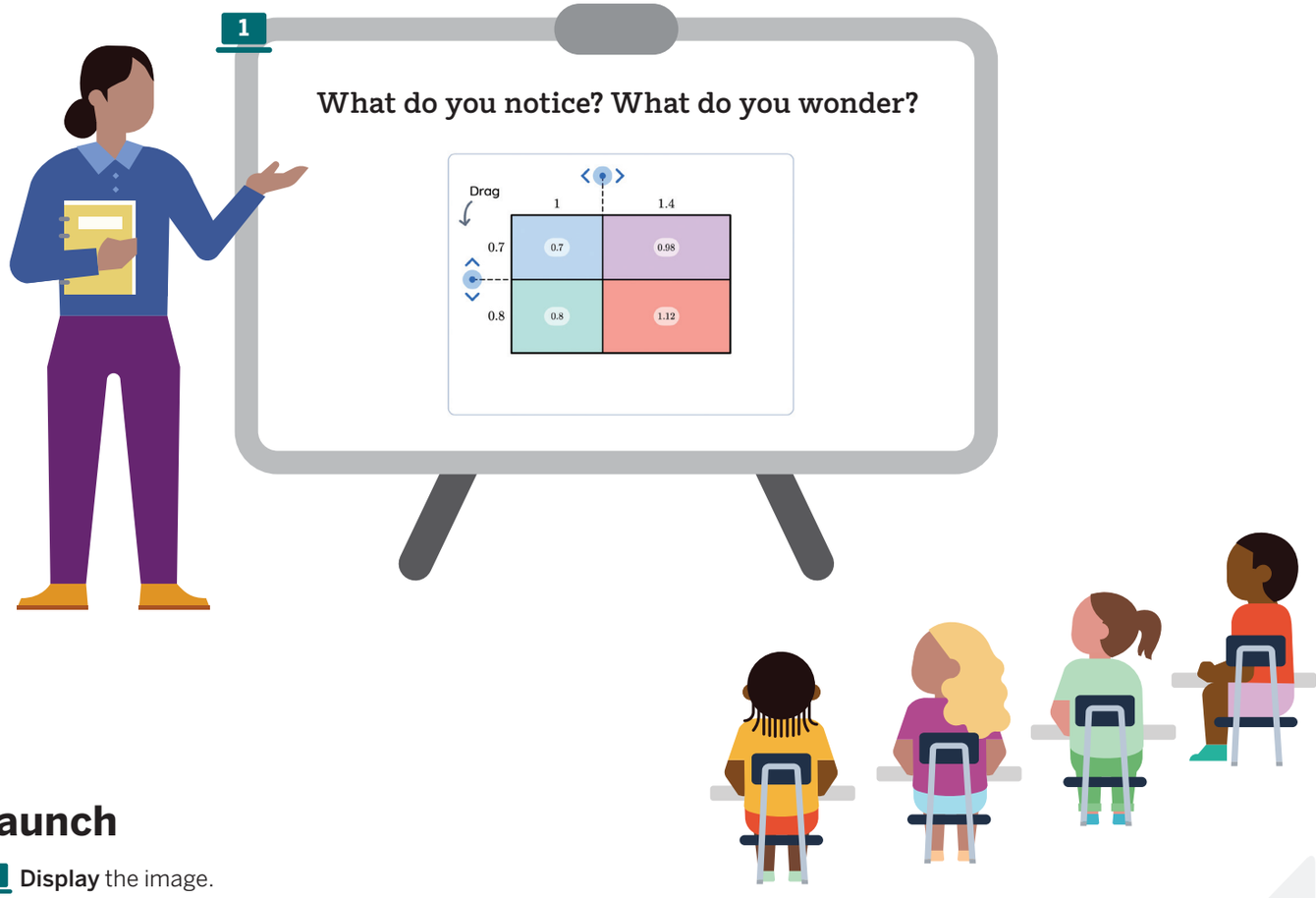
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students examine different ways to decompose decimal factors using an area model. This prepares them to determine the product of 2 decimals greater than 1 in Activity 1.

Students using print





1 Launch

1 **Display** the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

Students using print: Have students demonstrate how they would drag the points to decompose each factor.

2 Connect

1 **Record** students' responses as they share.

Ask, "How is decomposing decimal factors in an area model similar to decomposing whole number factors?"

Students might say . . . ELPS 2.B

I notice that when I move the points, I can change how 1 or both factors are decomposed, but the product remains the same.

I notice that the factors can be decomposed in many different ways.

I wonder whether decomposing factors with decimals is the same as decomposing factors with whole numbers.

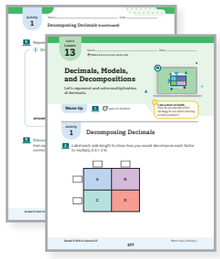
I wonder whether decomposing both factors is more helpful than decomposing only 1 factor.

Pairs | 20 min | Suggested Pacing: Screens 2–6

Activity 1 Decomposing Decimals

Purpose: Students use area models to determine the products of 2 decimals greater than 1. They see that they can decompose in many ways, including by place value.

Students using print



1 Launch

2 **Say,** "Complete Screens 2–6 with your partner."

2 Monitor

After students have completed **Screen 5**, refer to the D **Differentiation | Teacher Moves** table on the following page.

2-6 **If students need help getting started . . .**

- Ask, "How could you use what you did in the Warm–Up to get started?"
- Ask, "If the factors were whole numbers, how would you use the area model to multiply? How could that help you use the area model to multiply 2 decimals?"

3 Connect

5 **Invite students to share** their responses and strategies for Screen 5. Ensure students see different ways of decomposing 1 or both factors, such as the strategies shown in Rows 2 and 3 in the *Differentiation* table.

Ask:

- "What is similar about the decomposing strategies that were used to multiply? What is different?"
- "Which is the most helpful way to decompose when you multiply with decimals? Why?"

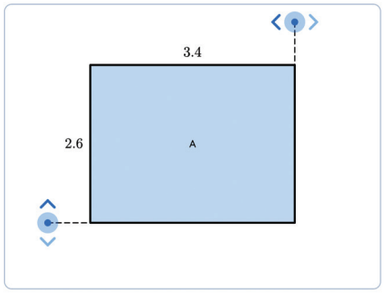
Key Takeaway: Say, "When multiplying 2 decimals greater than 1, you can decompose 1 or both factors by place value and represent your partial products with an area model. This is similar to your work with whole number multiplication."

Students using digital

2

Drag the points to show how you would decompose the factors to multiply 3.4×2.6. You will calculate the partial products on the next screen.

Explain why you chose to decompose the factors in this way.



Students show how they would decompose the factors to multiply, such as decomposing 3.4 to 3 and 0.4 and decomposing 2.6 to 2 and 0.6

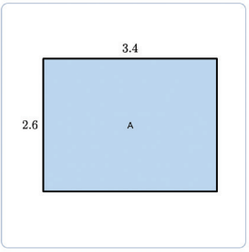
3-4

Your diagram from the previous screen is shown.

Calculate each partial product.

Part	Partial product
A	
B	
C	
D	

Check

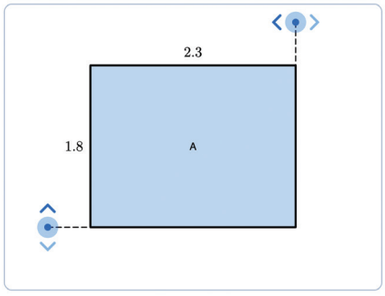


Students use an area model to determine the products of 3.4 × 2.6 and 2.7 × 1.3.

5

Represent 2.3×1.8 using the area model, then solve.

Check



Students use an area model to decompose 2.3 × 1.8, then solve for the product.

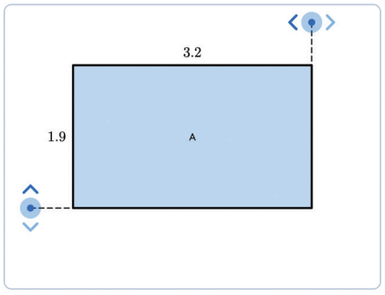
6

Han said $3.2 \times 1.9 = 3.18$ because $3 \times 1 = 3$ and $0.2 \times 0.9 = 0.18$.

Is Han correct?

yes no

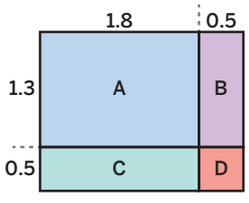
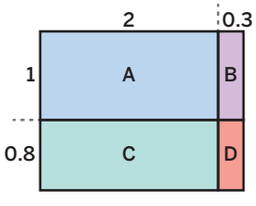
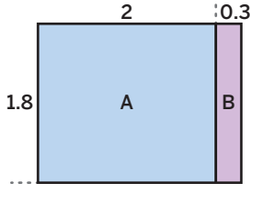
Discuss
How do you know?



Students may explain that Han is not correct because he did not multiply all partial products.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

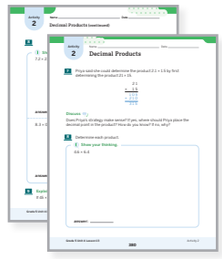
Look for students who . . .	For example . . .	Provide support . . .
Almost there Decompose the factors into some friendly numbers.		**Support** Ask, "How could you decompose both factors so that all the parts are helpful when multiplying?"
Decompose both factors by place value.		**Strengthen** Ask, "How else could you decompose the factors to multiply?"
Decompose 1 factor by place value.		

Pairs | 15 min | Suggested Pacing: Screens 7–9

Activity 2 Decimal Products

Purpose: Students consider how to use whole number multiplication and place value reasoning to multiply 2 decimals greater than 1 and place the decimal point in the product.

Students using print



1 Launch

7 **Read aloud** Screen 7. ELPS 1.E

Invite pairs to share their responses to the questions on Screen 7.

Say, "Complete Screens 8 and 9 with your partner."

A **Accessibility: Memory and attention** As students complete Screen 8, chunk this task into smaller, more manageable parts by having students first decompose the factors using the area model and then solve for each partial product.

2 Monitor

After students have completed **Screen 9**, refer to the D **Differentiation | Teacher Moves** table on the following page.

8 **If students need help getting started . . .**

- Ask, "How could you use Priya's strategy to help you get started?"
- Ask, "How could you reason about where to place the decimal point in the product?"

3 Connect

9 **Invite students to share** their responses for Screen 9. Select and sequence their responses in the order shown in the *Differentiation* table.

Ask (if not yet mentioned during discussion), "How could you determine the location of the decimal point when multiplying any 2 decimals?"

MLR **MLR1: Stronger and Clearer Each Time** ELPS 1.E, 2.E

Have students discuss in pairs, then meet with another pair to share their responses. Encourage listeners to ask clarifying questions using stems, such as:

- "What do you mean by . . .?"
- "Can you tell me more about . . .?"

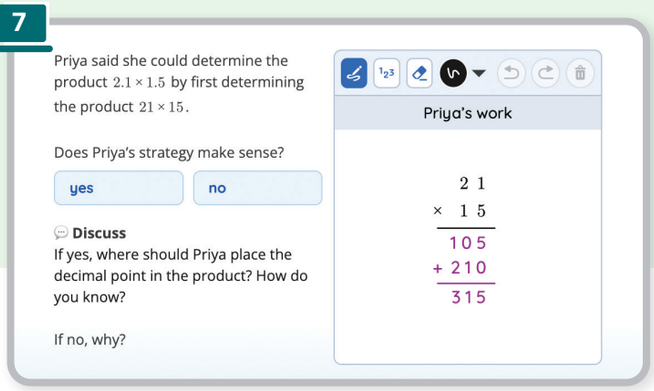
Have students revise their responses based on the feedback they receive.

EB **Emergent Bilinguals:** Use wait time to allow students to formulate and rehearse a response with a partner before sharing with the class. ELPS 1.E, 2.D, 2.F

Key Takeaway: Say, "When multiplying 2 decimals greater than 1, you can use your understanding of place value to reason about the size of the product and the placement of the decimal point."

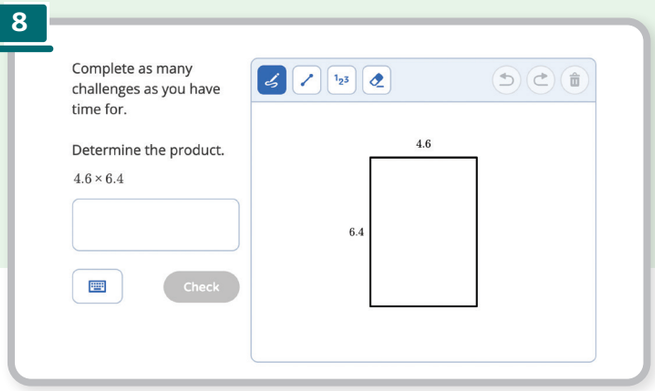
Students using digital

7



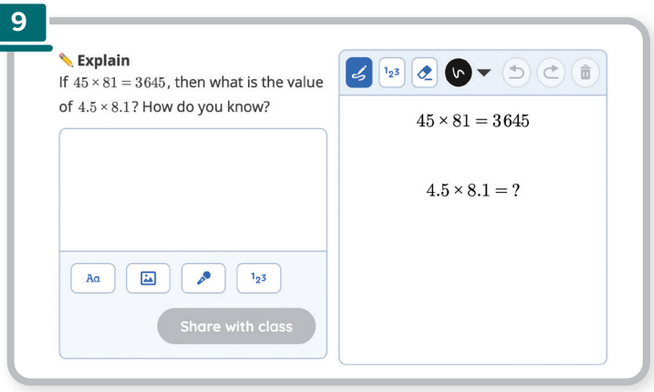
Students may notice that Priya's strategy does work and that they can use the place value of the factors to place the decimal point.

8



Students determine the products of multiplication expressions, such as 4.6 x 6.4

9



Students use the multiplication equation 45 x 81 = 3645 to determine the value of the multiplication expression 4.5 x 8.1, relating operations with whole numbers to operations with decimals.

Students using print **will arrive at similar answers.**

D Differentiation | Teacher Moves

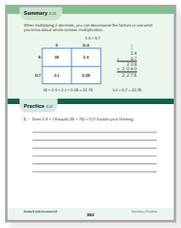
Look for students who . . .	For example . . .	Provide support . . .
Almost there Use the ending place value of the factors to reason.	The product is 364.5 because both factors end in the tenths place, so the product should end in the tenths place.	**Support** Ask, "What is the product of $\frac{1}{10} \times \frac{1}{10}$? How does that help you revise your answer?"
Use the place value of the factors to reason about the place value of the product.	The product is 36.45 because both factors end in the tenths place, so the product is in the hundredths place.	**Stretch** Ask, What can you conclude about the placement of the decimal point when multiplying 2 decimals?
Use whole number estimation.	The product is 36.45 because 4 × 8 = 32, so 36.45 is a reasonable product. 364.5 is too large, and 3.645 is too small.	

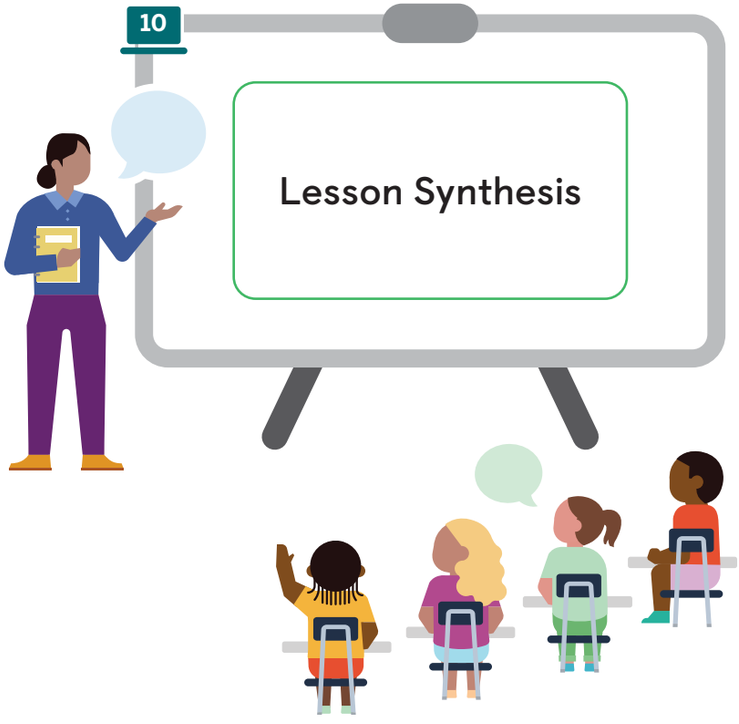
Whole Class | 10 min | Suggested Pacing: Screen 10

Synthesis

Lesson Takeaway: An understanding of whole number and decimal multiplication can be used to multiply 2 decimals.

Students using print





10 **Display** the Synthesis Screen.

Ask, "What are different ways you can multiply any 2 decimals? You can use 12.3 × 5.6 as an example."

Say, "Just like when multiplying whole numbers, you can use estimation, properties of operations, and place value strategies to multiply any 2 decimals and determine whether a product is reasonable."

Invite students to refer to the **Summary** during Practice or anytime during the year.

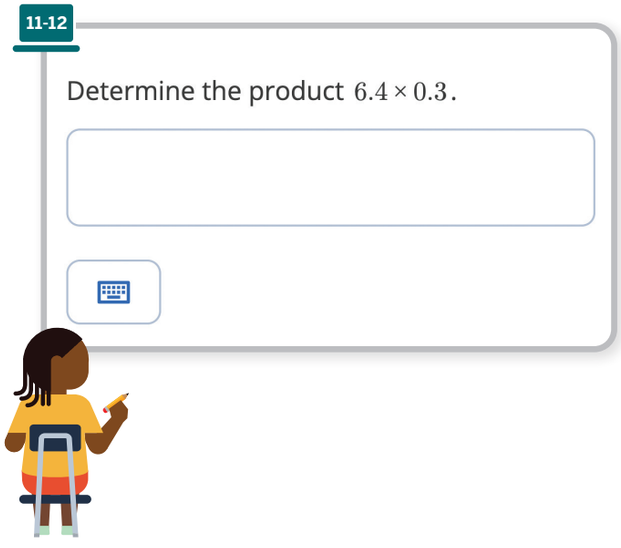
Show What You Know

Independent | 5 min |
Suggested Pacing: Screens 11–12

Students using print

(Show What You Know PDF)

Students using digital



Today's Goals

1. **Goal:** Determine the product of 2 decimals using area models, place value, and whole-number multiplication strategies.
   - In the *Show What You Know*, students determined the product of 2 decimals.
2. **Language Goal:** Explain how to reason about the placement of the decimal point when multiplying 2 decimals. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 13
Practice

Students using digital

Students using print

Summary 4.13

When multiplying 2 decimals, you can decompose the factors or use what you know about whole number multiplication.

3.4 × 6.7

	3	0.4
6	18	2.4
0.7	2.1	0.28

18 + 2.4 + 2.1 + 0.28 = 22.78

```
  2 2
    3 4
×   6 7
  2 3 8
+ 2,0 4 0
  2,2 7 8
```

3.4 × 6.7 = 22.78

Practice 4.13

1 Does 3.9 × 7.8 equal (39 × 78) × 0.1? Explain your thinking.
Sample explanation shown.
No. The expression can be rewritten as 39 × 0.1 × 78 × 0.1. I can rearrange and group the factors as (39 × 78) × (0.1 × 0.1). Because 0.1 × 0.1 is 0.01, I can write the expression as (39 × 78) × 0.01.

Practice 4.13

Name _____ Date _____

2 Clare has a bulletin board that is 1.7 yards by 4.1 yards. If Clare wants to cover the bulletin board in decorative paper, how many square yards of paper does she need?

Record your answer in the space provided.

6.97 square yards

3 Use an area model to determine the product 5.6 × 3.4.
Sample work shown.
Show your thinking.

	5	0.6
3	15	1.8
0.4	2.0	0.24

15 + 1.8 + 2 + 0.24 = 19.04

answer: 19.04

Practice 4.13

Name _____ Date _____

4 Use an area model to determine the product 21.5 × 3.5.
Show your thinking. Sample work shown.

	20	1	0.5
3	60	3	1.5
0.5	10	0.5	0.25

60 + 10 + 3 + 0.5 + 1.5 + 0.25 = 75.25

answer: 75.25

Spiral Review

5 Determine the product 973 × 25 using the standard algorithm.
Show your thinking.

```
    1
    3 1
    9 7 3
×     2 5
  4,8 6 5
+ 1 9,4 6 0
  2 4,3 2 5
```

answer: 24,325

For Problems 6 and 7, determine the quotient.

Show your thinking.

6 5,278 ÷ 14

```
    3 7 7
14)5 2 7 8
  - 4 2↓
    1 0 7↓
  -   9 8↓
      9 8
  -   9 8
      0
```

answer: 377

7 8,450 ÷ 26

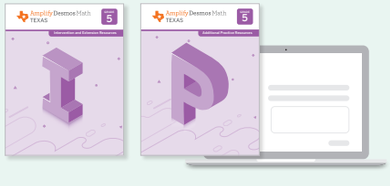
```
    3 2 5
26)8 4 5 0
  - 7 8↓
      6 5↓
  -   5 2↓
      1 3 0
  -   1 3 0
      0
```

answer: 325

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	3	5.3.E
Test Practice	2	2	5.3.E
	3, 4	1	5.3.D, 5.3.E
Spiral Review			
Fluency	5	1	5.3.B
Fluency	6, 7	1	5.3.C

Need more Practice?



Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 13

Lesson Goal: Determine the product of 2 decimals using area models, place value, and whole-number multiplication strategies.

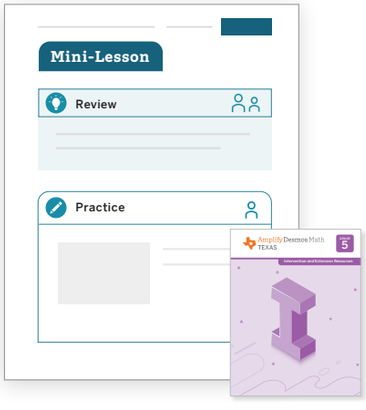
Support

Provide targeted intervention for students by using these resources.

If students multiply 2 decimals and place the decimal point to reflect the decimal placement in the factors:

Respond:

- Assign the *Multiplying Two Decimals* **Mini-Lesson.** | 15 min
- Revisit Lesson 12.



Strengthen

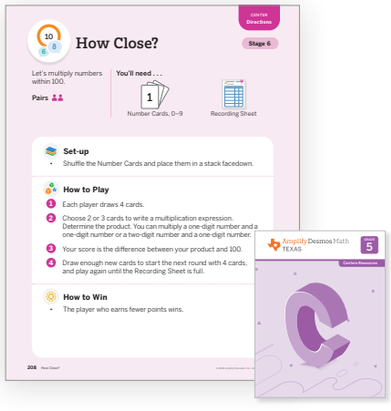
Reinforce students' understanding of the concepts assessed by using these resources.

If students multiply 2 decimals with a product in the hundredths place using whole number multiplication:

Respond:

- Invite students to play these **Centers.** | 15 min
  How Close:
  - ***Multiply to 100***
  - *Multiply to 3,000*

  Match It: Division Representations
- Have students complete **Lesson 13 Practice.** | 15 min
- **Item Bank**



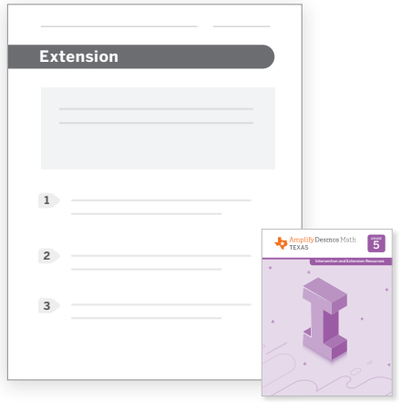
Stretch

Challenge students and extend their learning with these resources.

If students multiply 2 decimals with a product in the hundredths place using place value reasoning and whole number multiplication:

Respond:

- Invite students to explore the **Sub-Unit 2 Extension Activities.** | 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. | 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *product/producto*
- Frayer Model templates
- Vocabulary routines

Professional Learning

If you were to teach this lesson again, what would you do the same? What would you change?

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

Quiz: Sub-Unit 2

Independent | 20 min

Facilitation: Assign this Sub-Unit Quiz at the end of Sub-Unit 2 to evaluate students' proficiency with the key concepts and skills addressed in this sub-unit.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis

Problems	Concept or skill	DOK	TEKS
1–3	Multiplying decimals to the hundredths	1	5.3.D *(S)*, 5.3.E *(R)*

Assessment Resources

- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources

Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

During Sub-Unit 3, if students need further review or practice with concepts or skills, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

PDF *Assessment Resource PDF*

Digital

Unit 4
Quiz: Sub-Unit 2

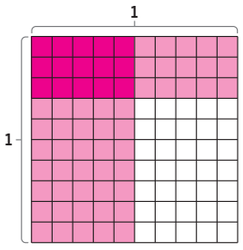
Name _____ Date _____

Quiz: Sub-Unit 2

Unit 5.4

1 Determine the product by shading the hundredths grid.

0.3 × 0.5



answer: 0.15

2 Determine the product.

2.1 × 7.3

Show or explain your thinking.

Sample work shown.

	7	0.3
2	14	0.6
0.1	0.7	0.03

$$\begin{array}{r} 14.00 \\ 0.60 \\ 0.70 \\ +\ 0.03 \\ \hline 15.33 \end{array}$$

answer: 15.33

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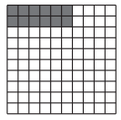
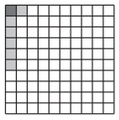
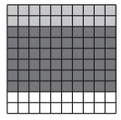
Name _____ Date _____

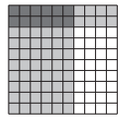
Quiz: Sub-Unit 2 (continued)

3 Which model represents the equation 0.2 × 0.6 = 0.12?

A. 

B. 

C. 

D. 

D Differentiation (Quiz: Sub-Unit 2)

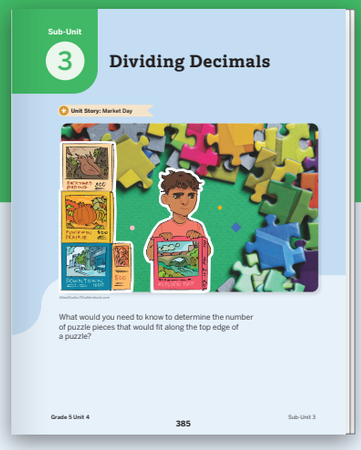
To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goal	Problems	Respond to Student Thinking
Sub-Unit 2: Multiply decimals with products resulting in the hundredths using place value reasoning and properties of operations.	1–3	**Support** • **Mini-Lesson:** *Multiplying Two Decimals* (ML 4.13) • **Center:** *Mystery Number, Decimals* • **Teacher Move:** For Problem 1, review the problem by using the grid. Then provide additional opportunities for students to determine the value of a multiplication expression with 2 decimals.

Notes:

Sub-Unit 3

Dividing Decimals



Sub-Unit 3 Goal

- Divide decimals of up to four digit dividends with quotients resulting in the hundredths using place value reasoning and properties of operations using objects, area models, and the standard algorithm.

Progression of TEKS in Sub-Unit 3

- **Lessons 14–15:** Students represent decimal division with hundredths models and area models.
- **Lessons 16–17:** Students relate decimal division to whole number division to determine decimal quotients. They use estimation to reason about the size of quotients. Students extend their understanding of dividing using the standard algorithm to divide decimal dividends of up to four digits by whole number divisors of up to two digits.

Sub-Unit 3 Progression	Lesson 14	Lesson 15	Lesson 16	Lesson 17
Number operations				
TEKS 5.3.A	○	○	○	●
TEKS 5.3.F	●	●	○	○
TEKS 5.3.G	○	○	●	●

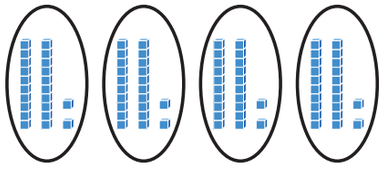
Math That Matters Most

Sub-Unit 3: Use objects, models, and the standard algorithm to divide decimals of up to four digits by whole number divisors of up to two digits.

Progression of Strategies, Skills, or Language

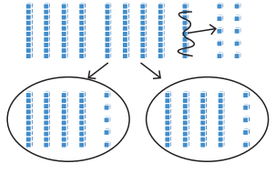
Using objects to represent and solve for decimal quotients.

0.88 ÷ 4



Kara has 0.9 cups of black paint to paint 2 miniature penguins. She wants to use the same amount of black paint on each penguin. How many cups of paint should she use for each penguin?

She should use 0.45 cups for each penguin.



Using pictorial models to represent and solve for decimal quotients

A zookeeper has 345.75 pounds of food. The food gets equally shared between 15 elephants. How many pounds of food does each elephant get?

Each elephant will get 23.05 pounds of food.

	2	3	0.05
15	30	45	0.75

Estimating to reason about the size of decimal quotients.

Estimate the quotient 32.8 ÷ 4.

The quotient should be close to 8.

Explain how you know your estimate from Problem 1 is reasonable.

I know my estimate is reasonable because 8 times 4 is 32 and 32 is close to 32.8.

Dividing decimals by whole numbers using the standard algorithm

23.96 ÷ 4 = **5.99**

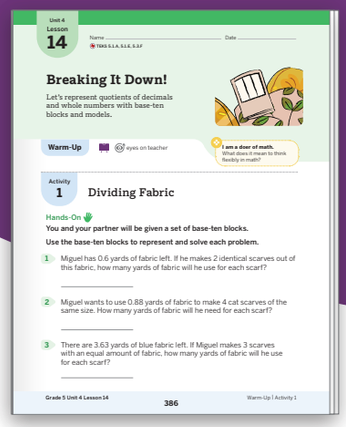
```
      5  9  9
   ┌──────────
 4 │ 2  3  9  6
 − │ 2  0
   ──────
      3  9
   −  3  6
   ──────
         3  6
      −  3  6
      ──────
            0
```

841.4 ÷ 2 = **420.7**

```
      4  2  0.  7
   ┌──────────────
 2 │ 8  4  1.  4
 − │ 8
   ──────
      0  4
   −  4
   ──────
         0  1  4
      −  1  4
      ──────
               0
```

Unit 4
Lesson
14

Student Edition pages and Presentation Screens support learning in this lesson.



Breaking It Down!

Representing Decimal Division With Hundredths Models

Let's represent quotients of decimals and whole numbers with base-ten blocks and models.

Key Concepts

Today's Goals

1. **Goal:** Represent quotients of decimals and whole numbers using objects and models.
2. **Language Goal:** Explain how decomposing values can be an effective strategy when dividing decimals by whole numbers. **(Listening and Speaking)**
   ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students make sense of real-world problems to solve for quotients of decimals and whole numbers. They create representations with base-ten blocks and pictorial models and use the representations to organize, record, and communicate how decimals can be decomposed into equal, whole number groups. **(TEKS 5.1.A, 5.1.E)**

Prior Learning

In Unit 3, students divided four-digit dividends by two-digit divisors.

Future Learning

In Lesson 15, students will represent quotients of decimals and whole numbers using area models.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of representing decimals with equivalent values.
- Students build **procedural skills** for dividing a decimal by a whole number using objects.

Vocabulary

Review Vocabulary

decompose

TEKS

Addressing

5.3.F

Represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models.

Math Process Standards: 5.1.A, 5.1.E, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.A, 3.D, 3.E, 3.F, 3.G, 3.H

Building On	Building Toward
5.3.C	**5.3.G**
4.4.E	

Building Math Identity

I am a doer of math.

What does it mean to think flexibly in math?

Invite students to reflect on this question as they complete this lesson.

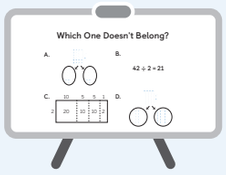
Lesson at a Glance 60 min

TEKS: 5.1.A, 5.1.E, 5.1.F, 5.1.G, 5.3.F

Warm-Up

Whole Class | 10 min

Students use the **Which One Doesn't Belong?** routine to determine how they can decompose values to divide using visual representations. They should be encouraged to use precise language as they give their reasons for the one they chose.
(TEKS 5.1.F, 5.1.G)

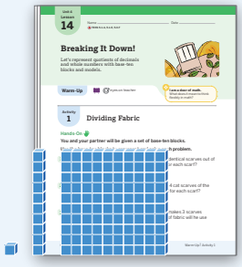


Activity 1

Pairs | 15 min

Students use base-ten blocks and pictorial models to divide decimals into whole number groups. They use the **Think-Pair-Share** routine to share what they notice about the size of the quotient and the connections they see to dividing whole numbers.

Manipulative Kit: base-ten blocks

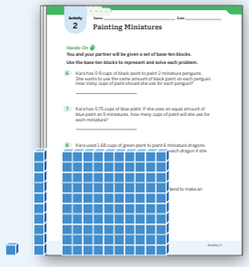


Activity 2

Pairs | 20 min

Students use base-ten blocks and pictorial models to divide decimals into whole number groups by decomposing decimal values. They use the **Think-Pair-Share** routine to explain how making equivalent values is helpful when dividing decimals by whole numbers.

Manipulative Kit: base-ten blocks



Synthesis

Whole Class | 10 min

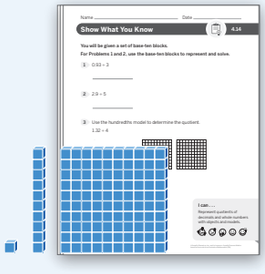
Students review and reflect on how they can use base-ten blocks to decompose decimals to determine the quotients of decimals and whole numbers.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by decomposing decimals into equal whole number groups.

Manipulative Kit: base-ten blocks
Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 2, Monitor** to support math language acquisition.

✓ Cognates
✓ Visuals
✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

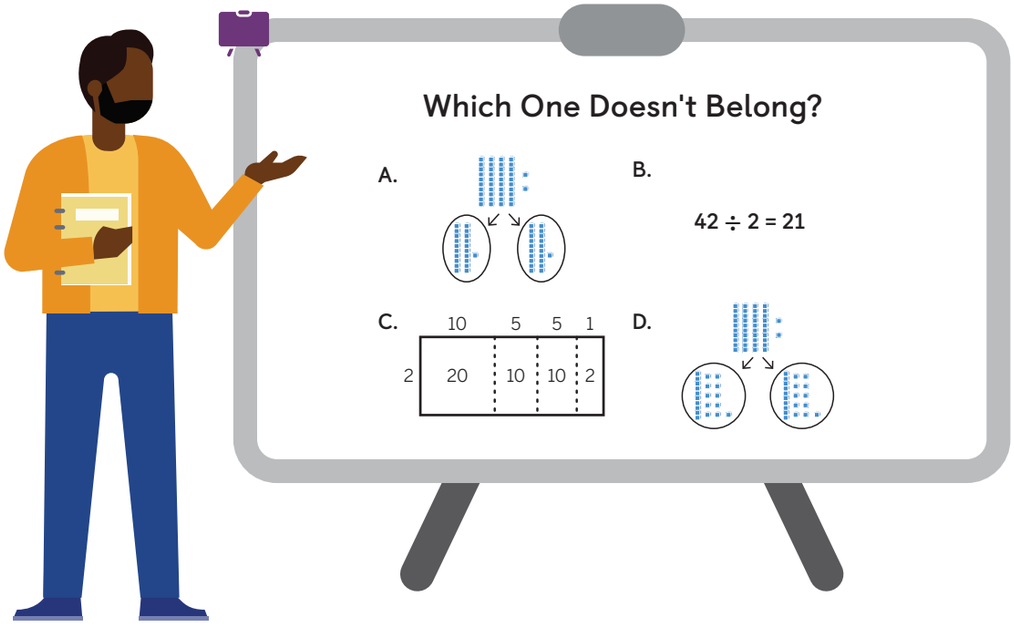
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screen

Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare visual representations of division of whole numbers to prepare them for dividing decimals by whole numbers.

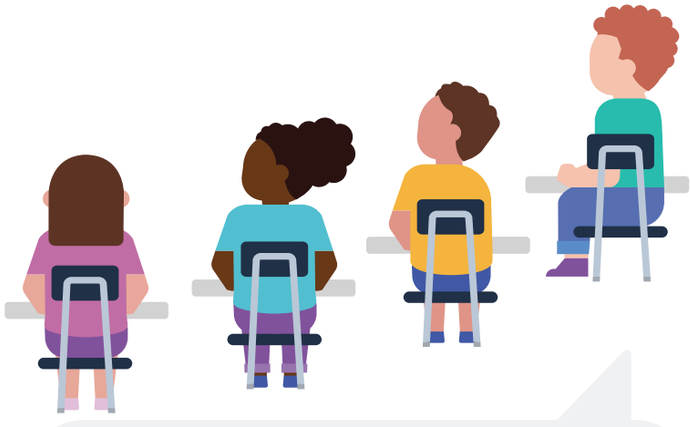


1 Launch

Display the 4 visual representations.

Use the Which One Doesn't Belong? routine.

Say, "Choose one that doesn't belong. Be ready to share your reasoning."



2 Connect

Record students' responses as they share.

Use the Think-Pair-Share routine. Ask, "What do you know about dividing whole numbers? Based on this, what can you predict about dividing decimals by whole numbers?"

Say, (if not mentioned in the discussion) You can use objects, models and equations to represent quotients of decimals.

Students might say . . . ELPS 2.C, 2.D, 2.E

A: *It is the only one that represents decomposing 42 in the most efficient way.*

B: *It is the only one that is an equation.*

C: *It is the only one that uses multiplication to solve for division.*

D: *It is the only one that decomposes 42 into ones that could be represented by tens instead.*

They all represent 42 divided by 2.

Pairs | 15 min

Activity 1 Dividing Fabric

Purpose: Students represent and solve story problems involving division of decimals by whole numbers with objects and hundredths models to build an understanding of division with decimals.

Presentation Screens

Materials

Manipulative Kit:

- Distribute base-ten blocks to each pair.

Short on time? Consider omitting Problems 4 and 5.

1 Launch

Read aloud the directions.

Display Problem 1.

MLR **MLR6: Three Reads** ELPS 1.E, 2.F, 3.A, 3.F, 3.G, 3.H

Read the story problem aloud 3 times.

- **Read 1:** Say, "Tell your partner what happened in the story without using any numbers."
- **Read 2:** Ask, "What math will Miguel use to solve the problem?"
- **Read 3:** Ask, "What might be a good first step in solving this problem using base-ten blocks?"

Say, "Complete Problems 1–3 with your partner using base-ten blocks. For Problems 4 and 5, you will use the hundredths models provided to solve. You may use base-ten blocks if it is helpful."

A **Accessibility: Executive functioning** Check for understanding by inviting students to rephrase the directions in their own words, clarifying as needed.

2 Monitor

After students have completed **Problem 2,** refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How can you use base-ten blocks to represent the dividend?"
- Ask, "How many groups will there be?"

3 Connect

Invite students to share their responses and strategies for Problem 2. Select and sequence their responses in the order shown in the *Differentiation* table.

Use the Think-Pair-Share routine. Ask, "What do you notice about the quotient? How is this similar to when dividing whole numbers?"

EB **Emergent Bilinguals** Create a classroom display that shows a visual of a decimal place value chart, including visual and numerical representations. Encourage students to use the chart to support them in understanding the meaning of each. ELPS 3.D, 3.F

Key Takeaway: Say, "Just like when dividing whole numbers, you can use base-ten blocks and area models to represent a dividend that is a decimal. Then you can divide the base-ten blocks into equal groups to determine the quotient."

Student Edition

Unit 4
Lesson
14

Name _____ Date _____

TEKS 5.1.A, 5.1.E, 5.3.F

Breaking It Down!

Let's represent quotients of decimals and whole numbers with base-ten blocks and models.

Warm-Up eyes on teacher

I am a doer of math.
What does it mean to think flexibly in math?

Activity 1

Dividing Fabric

Hands-On

You and your partner will be given a set of base-ten blocks.

Use the base-ten blocks to represent and solve each problem.

1. Miguel has 0.6 yards of fabric left. If he makes 2 identical scarves out of this fabric, how many yards of fabric will he use for each scarf?

   0.3 yards

2. Miguel wants to use 0.88 yards of fabric to make 4 cat scarves of the same size. How many yards of fabric will he need for each scarf?

   0.22 yards

3. There are 3.63 yards of blue fabric left. If Miguel makes 3 scarves with an equal amount of fabric, how many yards of fabric will he use for each scarf?

   1.21 yards

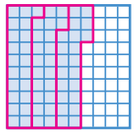
Activity 1

Name _____ Date _____

Dividing Fabric (continued)

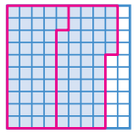
Represent the expression by shading the hundredths model and circling equal groups. Then determine the quotient. Sample work shown.

4. 0.63 ÷ 3



0.21

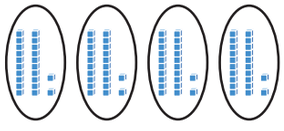
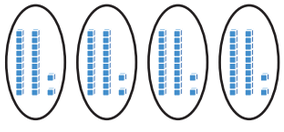
5. 0.84 ÷ 2



0.42

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the quotient as a whole number.	 22 yards	**S Support** Ask, "What is the value of the dividend? How can you represent the value in your quotient?"
Represent the quotient as a whole number and use place value understanding to place the decimal point.	 88 divided by 4 is 22, so 88 hundredths divided by 4 is 22 hundredths.	**S Strengthen** Ask, "How could you use the base-ten blocks to represent a decimal value?
Represent the quotient as a decimal and the dividend as separate tenths and hundredths.	 0.22 yards	**S Stretch** Ask, "How could you model this using a base-ten diagram? What is similar? What is different?"

Pairs | 20 min

Activity 2 Painting Miniatures

Purpose: Students deepen their understanding of the base-ten place value system by using base-ten blocks and hundredths models to decompose as a strategy for dividing.

Presentation Screens

Materials

Manipulative Kit:

- Ensure each pair has base-ten blocks.

1 Launch

Display 6 tenths.

Use the Think-Pair-Share routine. Ask:

- "How else could you use base-ten blocks to represent the same value?"
- "When might decomposing values be helpful when solving problems?"

Read aloud the directions.

Say, "You will complete Problems 6–11 with your partner. For Problems 6–8, you will use base-ten blocks to represent and solve the problems."

2 Monitor

After students have completed **Problem 6,** refer to the Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "How can you represent the dividend using base-ten blocks?"
- Ask, "How many groups will there be?"

3 Connect

Use the Think-Pair-Share routine. Ask, "How can making equivalent values by decomposing help you solve division problems? Encourage students to use base-ten blocks or pictorial models as they share their thinking."

MLR **MLR3: Critique, Correct, Clarify** ELPS 2.B, 2.D, 2.E, 3.E, 3.G

Display the following incorrect statement for Problem 6, "0.9 can be decomposed to make 10 hundredths. Then you can divide this into 2 equal groups." Ask:

- Critique: "What might this person be trying to say? How do you know?"
- Correct: "What could you add or change to make their statement true?"
- Clarify: "What could you add or change to make their statement easier to understand?"

Key Takeaway: Say, "When dividing a number of tenths by a whole number, sometimes it can be helpful to represent the number of tenths as an equivalent number of hundredths so you can make equal groups."

Activity 2

Name _____ Date _____

Painting Miniatures

Hands-On

You and your partner will be given a set of base-ten blocks.

Use the base-ten blocks to represent and solve each problem.

6 Kara has 0.9 cups of black paint to paint 2 miniature penguins. She wants to use the same amount of black paint on each penguin. How many cups of paint should she use for each penguin?

0.45 cups

7 Kara has 0.75 cups of blue paint. If she uses an equal amount of blue paint on 5 miniatures, how many cups of paint will she use for each miniature?

0.15 cups

8 Kara used 1.68 cups of green paint to paint 6 miniature dragons. How many cups of green paint did she use for each dragon if she used the same amount for each dragon?

0.28 cups

9 **Discuss**

In Problem 7, how did you decompose the dividend to make an equivalent value? How did this help you solve?

Oral activity: No writing expected. Sample response shown.

I decomposed 7 tenths into 5 tenths and 20 hundredths. This helped me solve because it made each value divisible by 5, so I was able to make equal groups of 5.

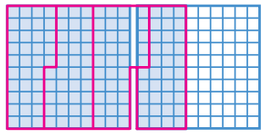
Activity 2

Name _____ Date _____

Painting Miniatures (continued)

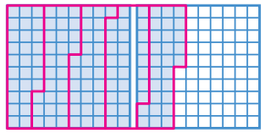
Represent the expression by shading the hundredths model and circling equal groups. Then determine the quotient. Sample work shown.

10 1.4 ÷ 4



0.35

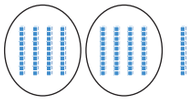
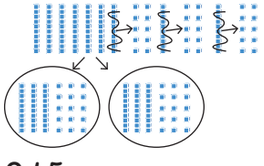
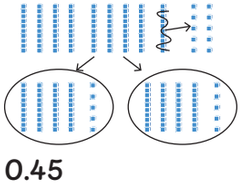
11 1.35 ÷ 5



0.27

Presentation Screens

D Differentiation | Teacher Moves

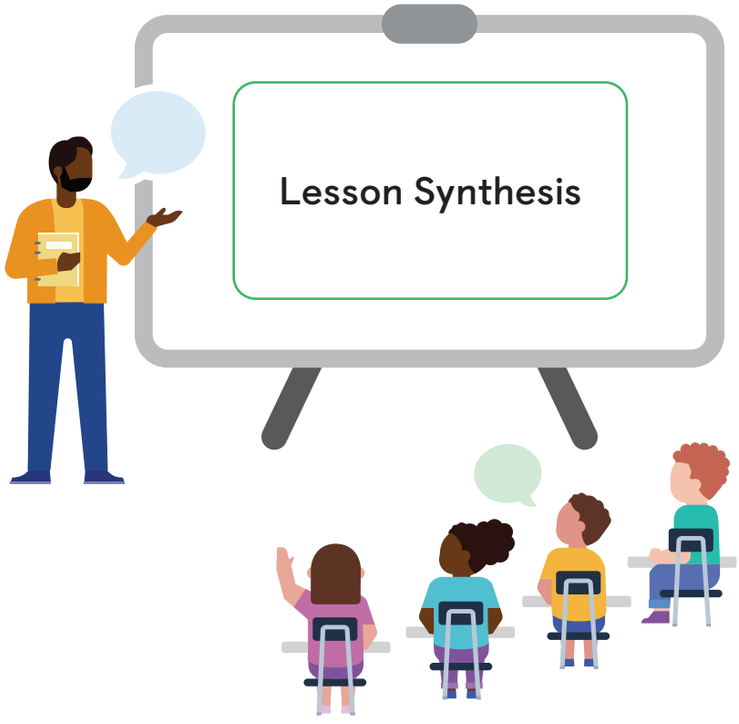
Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the quotient as tenths and a remainder.	 0.4 R1	**Support** Ask, "How can you decompose a tenth into a smaller value to continue dividing?
Represents the dividend by decomposing multiple tenths as hundredths to determine the quotient.	 0.45	**Strengthen** Ask, "How could you decompose the dividend more efficiently?"
Represents the dividend as tenths and hundredths to determine the quotient.	 0.45	**Stretch** Ask, "How could you record your work using an equation?"

Whole Class | 10 min

Synthesis

Presentation Screen

Lesson Takeaway: Just like when dividing whole numbers, when dividing a decimal by a whole number, you can use objects and models to decompose values by composing equivalent values in order to solve.



Ask, "How would you determine the value of this expression?"

Record students' explanations as expressions.

Say, "Just like whole number division, when dividing a decimal by a whole number, you can decompose the dividend using your understanding of the relationships between dividends, divisors, and partial quotients to determine the quotient."

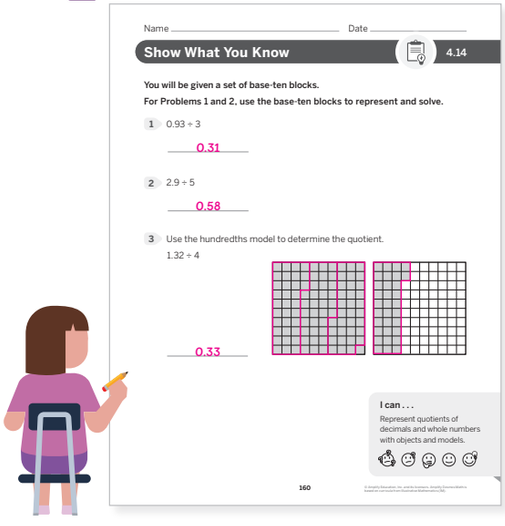
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.14

You will be given a set of base-ten blocks.

For Problems 1 and 2, use the base-ten blocks to represent and solve.

1. 0.93 ÷ 3

0.31

2. 2.9 ÷ 5

0.58

3. Use the hundredths model to determine the quotient.

1.32 ÷ 4

0.33

I can . . .

Represent quotients of decimals and whole numbers with objects and models.

160

Today's Goals

1. **Goal:** Represent quotients of decimals and whole numbers using objects and models.
   - In Problems 1 and 2 in the *Show What You Know*, students used base-ten blocks to represent and solve for quotients of decimals and whole numbers.
   - In Problem 3 in the *Show What You Know*, students used a hundredths model to represent and solve for the quotient of a decimal and a whole number.
2. **Language Goal:** Explain how decomposing values can be an effective strategy when dividing decimals by whole numbers. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 14
Practice

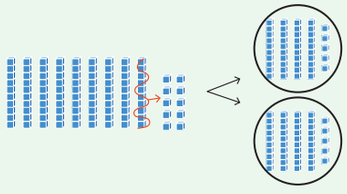
Students using digital

Students using print

Summary 4.14

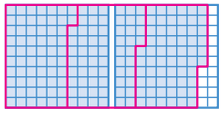
Just like whole number division, when dividing a decimal by a whole number, you can use base-ten blocks or decompose decimals into more manageable parts to determine the quotient.

$0.9 \div 2 = 0.45$



Practice 4.14

1 Use the hundredths model to determine the quotient.
1.86 ÷ 3 Sample work shown.



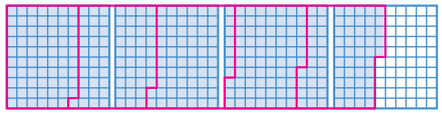
0.62

Practice 4.14

Name _____ Date _____

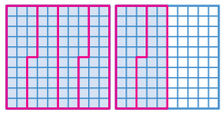
For Problems 2–4, use the hundredths model to determine the quotient.
Sample work shown.

2 Clare bought a 3.45-ounce bag of popcorn. If she wants to share the popcorn equally with her and 4 friends, how many ounces of popcorn will each friend get?



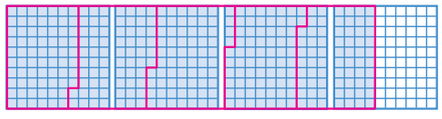
0.69 ounces

3 Diego made 6 identical bookmarks out of 1.5 sheets of paper. How many sheets of paper did he use for each bookmark?



0.25 sheets

4 Priya walked 3.4 miles in 5 days. If she walked an equal amount each day, how many miles did she walk in 1 day?

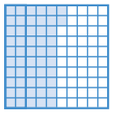


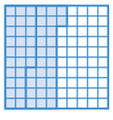
0.68 miles

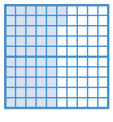
Practice 4.14

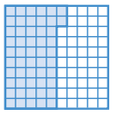
Name _____ Date _____

5 Which model represents 0.52 ÷ 2?

A 

B 

C 

D 

Spiral Review

6 Han has 3 cups of milk. He uses 1.25 cups of milk for breakfast and 0.8 cups of milk at lunch. How much milk does Han have left?
Sample work shown.

Show your thinking.

$$\begin{array}{r} {}^{9} \\ 2\,{}^{1}0{}^{1}0 \\ 3.00 \\ -\ 1.25 \\ \hline 1.75 \end{array} \qquad \begin{array}{r} 0\ 17 \\ 1.75 \\ -\ 0.80 \\ \hline 0.95 \end{array}$$

answer: 0.95 cups

7 At the market there are 8 pounds of apples. A customer buys 32 ounces of apples. How many pounds of apples are left? Use the table if it is helpful.

Pounds	Ounces
1 pound =	16 ounces

6 pounds

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–4	2	5.3.F
Test Practice	5	1	5.3.F
Spiral Review			
Fluency	6	2	5.3.K
	7	1	4.8.C

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 14

Lesson Goal: Represent quotients of decimals and whole numbers using objects and models.

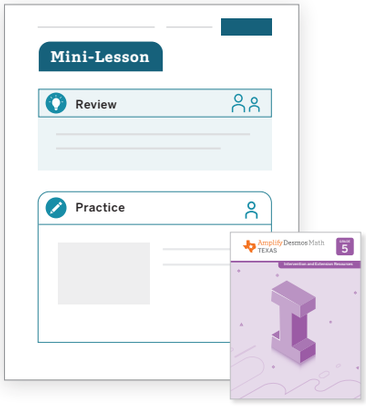
Support

Provide targeted intervention for students by using these resources.

If students represent the quotient with a remainder using base-ten blocks:

Respond:

- Assign the *Representing Decimal Division With Hundredths Models* **Mini-Lesson. |** 15 min
- Review representing decimal values in different ways.



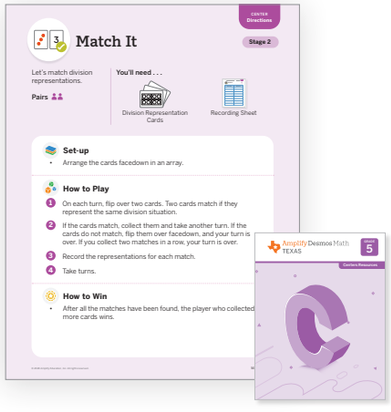
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students represent quotients using base-ten blocks and hundredths models:

Respond:

- Invite students to play these **Centers. |** 15 min
  Match It:
  - ***Division Representations***
  - *Multiplication and Division Problems*
- Have students complete **Lesson 14 Practice. |** 15 min
- **Item Bank**



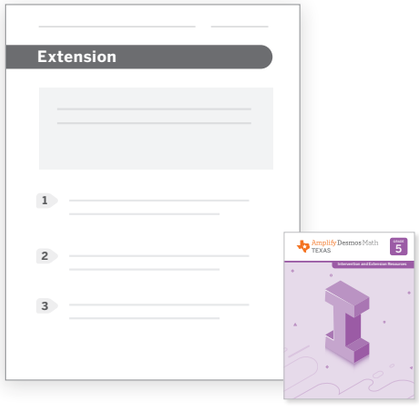
Stretch

Challenge students and extend their learning with these resources.

If students represent quotients of decimals and whole numbers by decomposing dividends using base-ten blocks and hundredth models:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

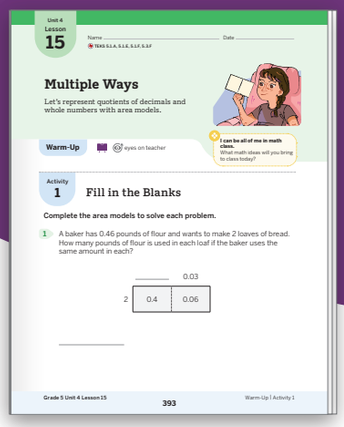
- English/Spanish cognates, e.g., *equivalent/equivalente*
- Frayer Model templates
- Vocabulary routines

Professional Learning

Reflect on the opportunities students have to be flexible with composing and decomposing numbers in this lesson. How can you support students with being flexible thinkers when it comes to representations of numbers?

Unit 4
Lesson
15

Student Edition pages and Presentation Screens support learning in this lesson.



Multiple Ways

Representing Division of Decimals With Area Models

Let's represent quotients of decimals and whole numbers with area models.

Key Concepts

Today's Goals

1. **Goal:** Represent quotients of decimal dividends and whole number divisors using area models.
2. **Language Goal:** Explain how the relationship between multiplication and division can be used to solve for quotients of decimals and whole numbers. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students make sense of real-world problems to solve for quotients of decimals and whole numbers. They create area model representations and use the models to organize, record, and communicate how decimals can be decomposed into equal, whole number groups. Students consider the multiplicative relationship between the divisor and dividend to communicate how they are decomposing within an area model. **(TEKS 5.1.A, 5.1.E, 5.1.F)**

Prior Learning

In Lesson 14, students used base-ten blocks to divide decimals by whole numbers.

Future Learning

In Lesson 16, students will use estimation to determine the reasonableness of quotients of decimals and whole numbers using any strategy.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of decomposing decimals.
- Students build **procedural skills** for dividing a decimal by a whole number using area models.

Vocabulary

Review Vocabulary

factor

TEKS

Addressing

5.3.F

Represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects **and pictorial models, including area models.**

Math Process Standards: 5.1.A, 5.1.E, 5.1.F

ELPS: 1.C, 1.E, 2.B, 2.C, 2.D, 2.E, 2.F

Building On	Building Toward
4.4.E	5.3.G

Building Math Identity

I can be all of me in math class.
What math ideas will you bring to class today?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance

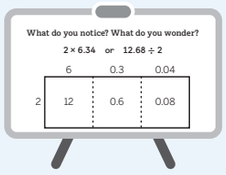
60 min

TEKS: 5.1.A, 5.1.E, 5.1.F, 5.3.F

Warm-Up

Whole Class | 10 min

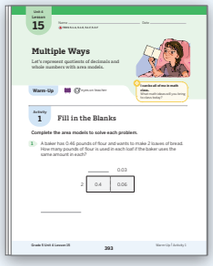
Students use the **Notice and Wonder** routine to share what they notice and wonder about the connection between multiplication and division when using an area model.



Activity 1

Pairs | 15 min

Students complete area models to represent division of decimals by whole numbers from story problems. They use the **Think-Pair-Share** routine to identify the connection between multiplication and division to prepare for creating their own area models in Activity 2.

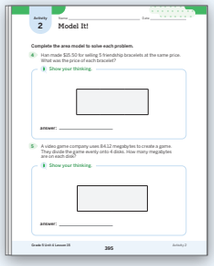


Activity 2

Pairs | 20 min

Students create area models to represent the division of decimal dividends by whole number divisors. They use the **Think-Pair-Share** routine to consider how to decompose the dividends based on the relationship between the dividend and divisor.

Manipulative Kit: base-ten blocks (as needed)



Synthesis

Whole Class | 10 min

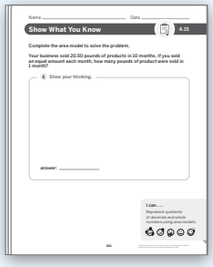
Students review and reflect on creating an area model that decomposes a dividend based on the relationship with the divisor.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by representing quotients of decimals and whole numbers using an area model.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

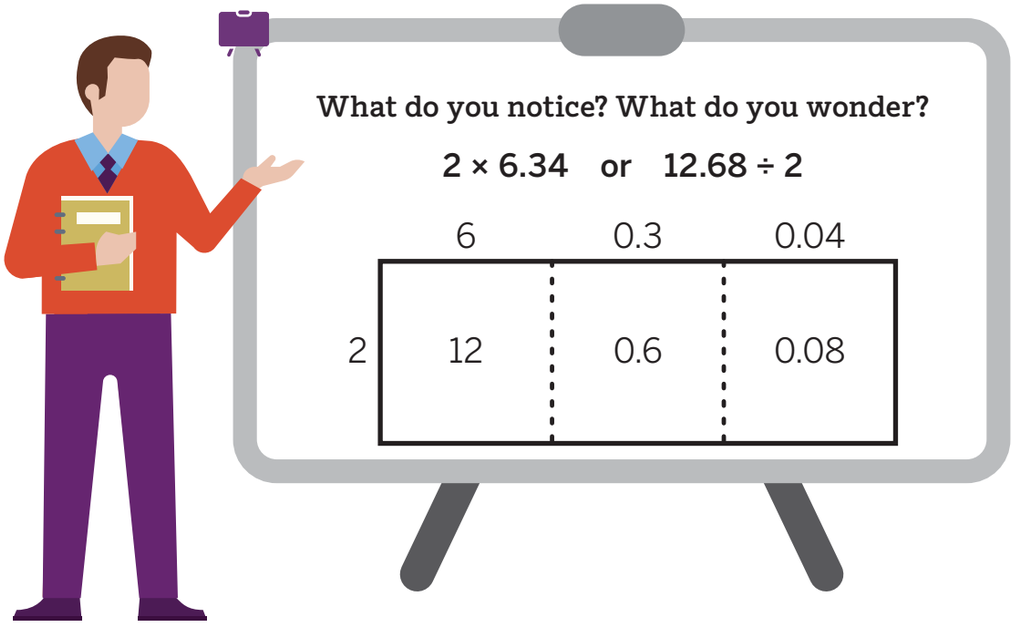
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

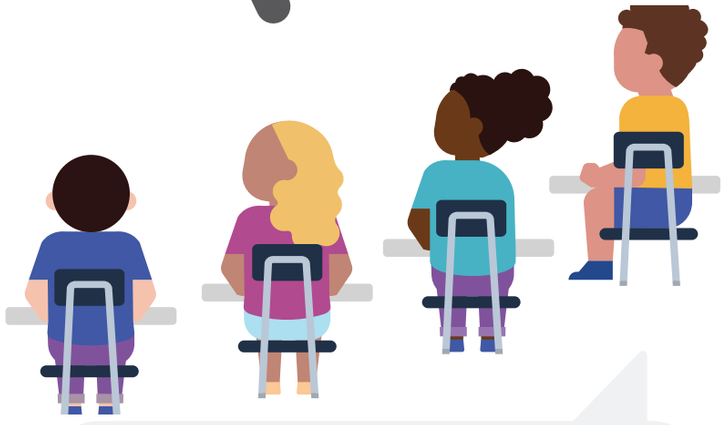
Whole Class | 10 min

Presentation Screens

Warm-Up Notice and Wonder

Purpose: Students examine an area model of a multiplication expression to make connections between how multiplication and division are used within this model to prepare them to use area models to divide decimals by whole numbers.





1 Launch

Display the image.

Use the Notice and Wonder routine.

Use the Think-Pair-Share routine. Ask, "What do you notice? What do you wonder?"

2 Connect

Record students' responses as they share.

Ask, "Where do you see multiplication in this model? Where do you see division in this model?"

Say, "The total area of the model is the product of the side lengths. The total area may also represent the dividend in an unknown factor problem."

Students might say . . . ELPS 2.B

I notice that multiplication is used to multiply the factor 2 by each place value of the second factor and the partial products are shown within the area model.

I notice that division is shown with the dividend in the center of the model and the quotient above by thinking about what is 12 divided by 2 or what times 2 equals 12.

I wonder if the same model can always be used for multiplication and division.

I wonder if there are other ways to decompose the dividend when using the area model.

Pairs | 15 min

Activity 1 Fill in the Blanks

Purpose: Students make connections between multiplication and division of decimals by whole numbers, using partially completed area models to prepare for work in Activity 2.

Presentation Screens

Short on time? Consider completing Problems 1–3 as a whole class.

1 Launch

Display the expression 10.2 ÷ 2.

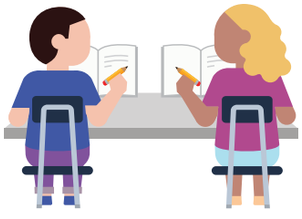
Use the Think-Pair-Share routine. Ask, "How could you represent this expression as an unknown factor equation?"

Display the equation 2 × ? = 10.2.

Use the Think-Pair-Share routine. Ask, "How might thinking of this problem as an unknown factor problem be useful?"

Say, "You will solve division problems with area models by using what you know about multiplication and division. Just like the businesses in the story *Market Day*, businesses and their employees in the real world also use division daily and need your help to determine quotients. With your partner, solve Problems 1–3 by completing the area models."

2 Monitor



After students have completed **Problem 2,** refer to the **D Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "Where do you see each part of the story problem represented in the model?"
- Ask, "What are you trying to determine?"

3 Connect

Display Problem 2.

Use the Think-Pair-Share routine. Ask:

- "How did you use multiplication to determine the unknown factor?"
- "How did you use division to determine the unknown quotient?"

Key Takeaway: Say, "You can use area models to represent problems in which a decimal is divided by a whole number. The model can be helpful for noticing how multiplication or division can both be used to determine the quotient."

Student Edition

Unit 4
Lesson
15

Name _____ Date _____

TEKS 5.1.A, 5.1.E, 5.1.F, 5.3.F

Multiple Ways

Let's represent quotients of decimals and whole numbers with area models.

Warm-Up eyes on teacher

I can be all of me in math class.
What math ideas will you bring to class today?

Activity 1

Fill in the Blanks

Complete the area models to solve each problem.

1 A baker has 0.46 pounds of flour and wants to make 2 loaves of bread. How many pounds of flour is used in each loaf if the baker uses the same amount in each?

	0.2	0.03
2	0.4	0.06

0.23 pounds

Activity 1

Name _____ Date _____

Fill in the Blanks (continued)

2 A mechanic has 0.96 quarts of oil. She divides the oil equally between 3 cars. How much oil does each car get?

	0.3	0.02
3	0.9	0.06

0.32 quarts

3 At a lemonade stand, 0.84 liters of lemonade are equally poured into 4 glasses. How many liters of lemonade are in each glass?

	0.2	0.01
4	0.8	0.04

0.21 liters

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent each partial quotient as a whole number.	3 2 3 | 0.9 | 0.06	**Support** Ask, "What do you know about the size of the quotient from the information given? How can you represent a value less than 1 in your partial quotients?"
Represent each partial quotient without representing the final quotient.	0.3 0.02 3 | 0.9 | 0.06	**Strengthen** Ask, "How can you use your partial quotient work to determine the final quotient?"
Represent each partial quotient and the final quotient.	0.3 0.02 3 | 0.9 | 0.06	**Stretch** Ask, "How else could you represent the dividend within the area model using what you know about equivalent values? Would your answer be the same? How do you know?"

Pairs | 20 min

Activity 2 Model It!

Purpose: Students use area models to decompose dividends to determine the quotient.

Presentation Screens

Materials

Manipulative Kit:

- Provide students with access to base-ten blocks (as needed).

1 Launch

Display the expression 4.16 ÷ 4 using base-ten blocks.

Use the Think-Pair-Share routine. Ask:

- "How could you use an area model to represent this expression?"
- "Why might decomposing the dividend this way be helpful when solving?"

Say, "Work with your partner to solve Problems 4–7 using area models. Think about what you know about the relationships between the dividend and the divisor to help you decompose the dividend."

A **Accessibility: Visual-spatial processing** Provide students with base-ten blocks to visually decompose the dividend before representing it on the area model.

2 Monitor

After students have completed **Problem 5,** refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What does the problem tell you? What are you trying to solve?"
- Ask, "What do you know about the relationship between the divisor and the dividend?"

3 Connect

MLR **MLR7: Compare and Connect** ELPS 1.E, 2.B, 2.D, 2.E

- Display the 2 area models that represent Problem 6.
- Ask, "How are the area models similar? How are they different?"
- Use the Think-Pair-Share routine. Ask:
  - "Where do you see multiplication in this model?"
  - "Where do you see division in this model?"
  - "How does the operation you use affect what goes in the area model?"

EB **Emergent Bilinguals** Encourage students to make sense of the 2 area models by discussing what they notice and wonder in their primary language before discussing in English. ELPS 1.C, 1.E, 2.C, 2.F

Key Takeaway: Say, "When dividing decimals by whole numbers, you can decompose the dividend in more than 1 way and divide each part separately."

Student Edition

Activity 2

Name _____ Date _____

Model It!

Complete the area model to solve each problem. Sample work shown.

4 Han made $15.50 for selling 5 friendship bracelets at the same price. What was the price of each bracelet?

Show your thinking.

	2	1	0.10
5	10	5	0.50

answer: $3.10

5 A video game company uses 84.12 megabytes to create a game. They divide the game evenly onto 4 disks. How many megabytes are on each disk?

Show your thinking.

	21	0.03
4	84	0.12

answer: 21.03 megabytes

Activity 2

Name _____ Date _____

Model It! (continued)

6 A zookeeper has 45.75 pounds of food. The food gets equally shared between 15 elephants. How many pounds of food does each elephant get?

Show your thinking.

	2	1	0.05
15	30	15	0.75

answer: 3.05 pounds

7 Clare spends her day helping customers over the phone. She spent a total of 96.63 minutes talking to 3 customers. If she spent an equal amount of time talking to each customer, how many minutes did she spend talking with 1 customer?

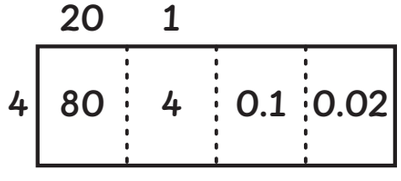
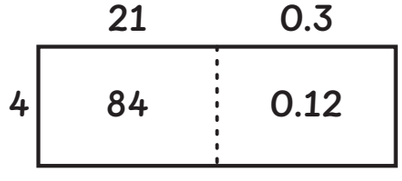
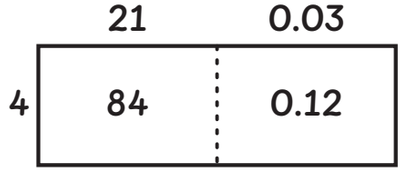
Show your thinking.

	32	0.2	0.01
3	96	0.6	0.03

answer: 32.21 minutes

Presentation Screens

D Differentiation | Teacher Moves

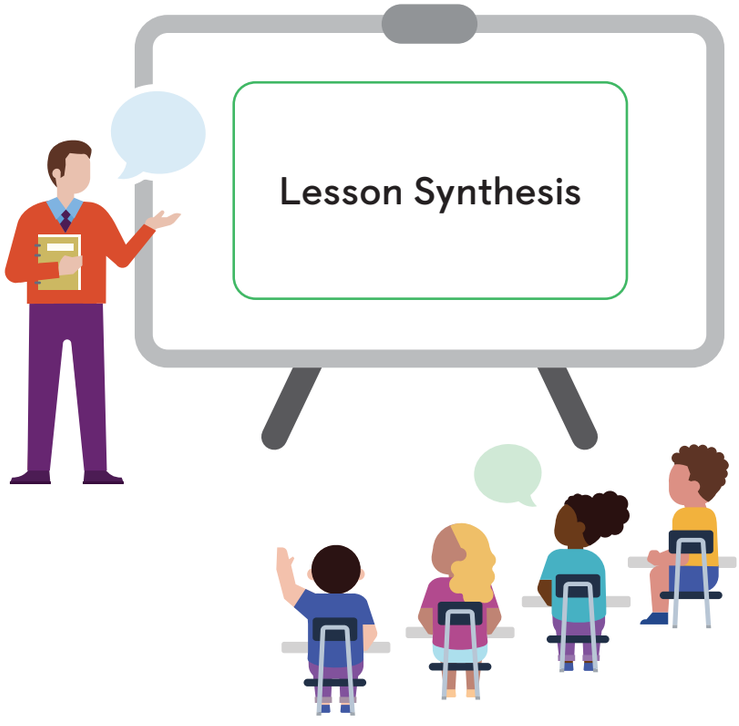
Look for students who . . .	For example . . .	Provide support . . .
Almost there Decompose the dividend by place value.		**Support** Ask, "What do you know about the relationship between the dividend and the divisor? How can you use this to decompose the dividend in a way that helps you divide?"
Almost there Decompose the dividend and represents the partial quotient as tenths.		**Support** Model dividing 0.12 into 3 groups using base-ten blocks. Ask, "What place value is represented here? How can you reflect this in your partial quotients?" or Ask, "How can you visualize what is happening here?"
Decompoess the dividend using relationships between the dividend and divisor.		**Strengthen** Ask, "How else could you decompose the dividend to easily divide by the divisor?"

Whole Class | 10 min

Synthesis

Lesson Takeaway: Area models are a helpful strategy for decomposing decimals to divide by whole numbers. Depending on the mathematical relationship between the dividend and divisor, the dividend can be decomposed in more than 1 way.

Presentation Screens



Display the expression 96.84 ÷ 12 and a blank area model.

Use the Think-Pair-Share routine. Ask, "How could you decompose this in the most efficient way? How do you know this way is the most efficient?"

Say, "Area models can be a helpful strategy when dividing decimals. They help you think about the mathematical relationship between the dividend and divisor in a way that makes sense to you."

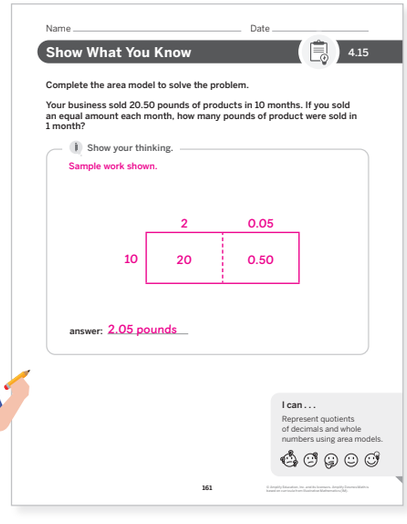
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.15

Complete the area model to solve the problem.

Your business sold 20.50 pounds of products in 10 months. If you sold an equal amount each month, how many pounds of product were sold in 1 month?

Show your thinking.

Sample work shown.

	2	0.05
10	20	0.50

answer: 2.05 pounds

I can . . .
Represent quotients of decimals and whole numbers using area models.

161

Today's Goals

1. **Goal:** Represent quotients of decimal dividends and whole number divisors using area models.
   - In the *Show What You Know*, students represented the quotient of a decimal dividend and a whole number divisor using an area model.
2. **Language Goal:** Explain how the relationship between multiplication and division can be used to solve for quotients of decimals and whole numbers. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 15
Practice

Students using digital

Students using print

Summary 4.15

Area models are a helpful strategy for decomposing decimals to divide by whole numbers. Depending on the mathematical relationship between the numbers in the dividend and divisor, you can decompose the dividend in more than 1 way.

$84.60 \div 2 =$

	42	0.30
2	84	0.60

$2 \times \underline{?} = 84$

$2 \times \underline{?} = 0.60$

Practice 4.15

1 Complete the area model to determine the quotient.

$936.9 \div 9$

Show your thinking.

Sample work shown.

	100	4	0.1
9	900	36	0.9

answer: 104.1

Practice 4.15

Name _____ Date _____

For Problem 2, use the number bank.

Number Bank					
0.21	25	3	0.25	50	0.3

2 Select the correct partial quotient for each part of the area model to represent the expression $56.42 \div 2$.

	25	3	0.21
2	50	6	0.42

3 Han and Diego both used area models to determine the quotient of $24.39 \div 3$. Whose area model is correct? Explain your thinking.
Sample explanation shown.

Han's Area Model

	8	0.13
3	24	0.39

Diego's Area Model

	7	1	0.1	0.03
3	21	3	0.3	0.09

Both. They both decomposed the dividend into parts that were factors of the divisor. Each quotient has the same value.

4 Priya ran for 63.77 minutes. If she ran a mile every 7 minutes, how many miles did she run? Sample work shown.

Show your thinking.

	9	0.11
7	63	0.77

answer: 9.11 miles

Practice 4.15

Name _____ Date _____

5 Complete the area model to determine the quotient.

$36.24 \div 12$

	3	0.02
12	36	0.24

3.02

Spiral Review

6 Miguel sews together 4 pieces of fabric with a total length of 123.4 centimeters.

- The first piece of fabric is 63.91 centimeters long.
- The second piece of fabric is 18.2 centimeters long.
- The fourth piece of fabric is 6.54 centimeters long.

What is the length of the third piece of fabric in centimeters?
Sample work shown.

Show your thinking.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 63.91 \\ 18.20 \\ +\ \ 6.54 \\ \hline 88.65 \end{array} \qquad \begin{array}{r} {\scriptstyle 0\,11121310} \\ \cancel{123.40} \\ -\ \ 88.65 \\ \hline 34.75 \end{array}$$

answer: 34.75 centimeters

7 A coffee shop starts the day with 25 gallons of coffee. They sell 19 gallons and 2 quarts. How much coffee is left in gallons and quarts? Use the table if it is helpful.

Gallons	Quarts
1 gallon	4 quarts

5 gallons and 2 quarts

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 4, 5	1	5.3.F
Test Practice	2	1	5.3.F
	3	2	5.3.F
Spiral Review			
Fluency	6	2	5.3.K
	7	1	4.8.C

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 15

Lesson Goal: Represent quotients of decimal dividends and whole number divisors using area models.

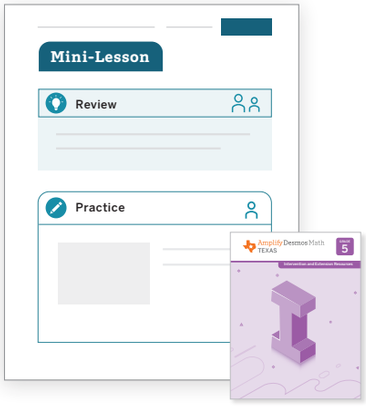
Support

Provide targeted intervention for students by using these resources.

If students decompose decimal dividends using place value to divide by whole numbers using an area model:

Respond:

- Assign the *Representing Division of Decimals With Area Models* **Mini-Lesson. |** 15 min
- Revisit Lesson 14.



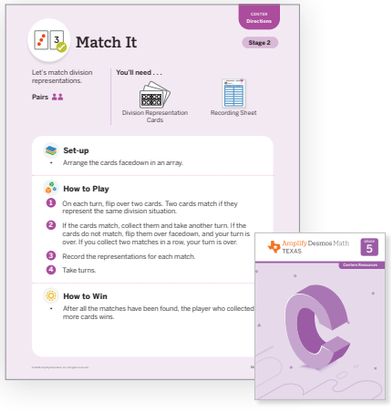
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students decompose decimal dividends using relationships to whole number divisors to divide using area models:

Respond:

- Invite students to play these **Centers. |** 15 min
  Match It:
  - ***Division Representations***
  - *Multiplication and Division Problem*
- Have students complete **Lesson 15 Practice. |** 15 min
- **Item Bank**



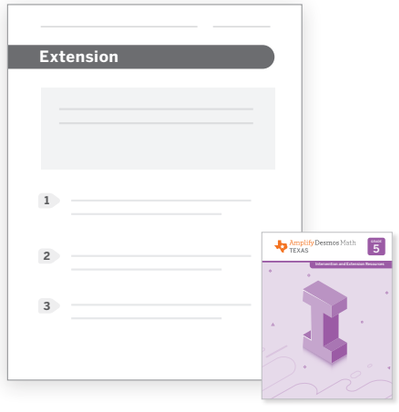
Stretch

Challenge students and extend their learning with these resources.

If students decompose decimal dividends using relationships to whole number divisors with the least amount of partial quotients to divide using area models:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

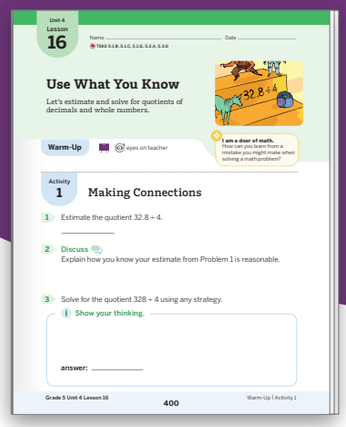
- English/Spanish cognates, e.g., *factor/factor*
- Frayer Model templates
- Vocabulary routines

Professional Learning

Think about which students haven't shared their strategies in class yet. Were there missed opportunities to highlight their thinking during recent lessons? How could you take advantage of those opportunities when they arise?

Unit 4
Lesson
16

Student Edition pages and Presentation Screens support learning in this lesson.



Use What You Know

Using Whole Number Division to Divide Decimals

Let's estimate and solve for quotients of decimals and whole numbers.

Key Concepts

Today's Goals

1. **Goal:** Estimate and solve for quotients of decimals to the hundredths divided by whole numbers.
2. **Language Goal:** Explain how estimating can be a helpful strategy to determine the reasonableness of quotients for decimals divided by whole numbers. **(Listening, Speaking, and Writing)** ELPS 1.E, 2.E, 2.F, 4.D, 4.F

Connections and Coherence

Students choose strategeies, such as mental math, number sense, and estimation, to solve for quotients of decimals divided by whole numbers. They make connections and use whole-number division strategies to solve and use place value understanding to explain the placement of the decimal point. Students use estimation to evaluate their problem-solving process and the reasonableness of their solutions. **(TEKS 5.1.B, 5.1.C, 5.1.G)**

Prior Learning

In Lesson 15, students created area models to represent decimals divided by whole numbers by considering the multiplicative relationship between the dividend and divisor.

Future Learning

In Lesson 17, students will use the standard algorithm to divide decimal dividends by whole number divisors.

Integrating Rigor in Student Thinking

- Students further their **conceptual understanding** of decimal place value by reasoning where the decimal belongs in the quotient.
- Students **apply** their understanding of estimating to solve problems that involve dividing a decimal by a whole number.
- Students **apply** their understanding of determining quotients of up to four-digit dividends and two-digit whole number divisors to solve problems that involve dividing a decimal by a whole number.

Vocabulary

Review Vocabulary

estimate

TEKS

Addressing

5.3.G

Solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm.

Also Addressing: **5.3.A**

Math Process Standards: 5.1.B, 5.1.C, 5.1.F, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 4.D, 4.F

Building On	Building Toward
5.3.C	6.3.E

Building Math Identity

I am a doer of math.

How can you learn from a mistake you might make when solving a math problem?

Invite students to reflect on this question as they complete this lesson.

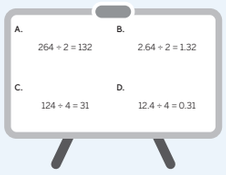
Lesson at a Glance 60 min

TEKS: 5.1.B, 5.1.C, 5.1.F, 5.1.G, 5.3.A, 5.3.G

Warm-Up Fluency

Whole Class | 10 min

Students use the **True or False?** routine, in which they determine whether a series of equations involving estimated quotients of decimals by whole numbers are true or false and justify their responses. **(TEKS 5.1.F)**



Activity 1

Independent | 15 min

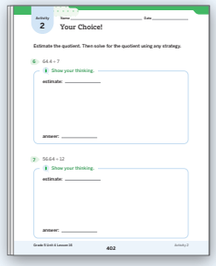
Students consider how they can use estimation and whole number division to solve for quotients of decimals divided by whole numbers.

Activity 2

Pairs | 20 min

Students estimate and then solve for quotients that involve up to four-digit decimal dividends divided by one- and two-digit whole number divisors using any strategy. They use the **Think-Pair-Share** routine to compare strategies and explain how estimating can be used to determine the reasonableness of a quotient.

Materials: *Division Strategies* PDF (as needed)



Synthesis

Whole Class | 10 min

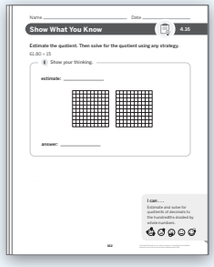
Students review and reflect on how they can use whole number division and estimation to determine the quotient of a decimal divided by a whole number.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by estimating and then solving a division expression involving a decimal dividend and a whole number divisor using any strategy.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

✓ Cognates ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F, 4.C, 4.D, 4.F

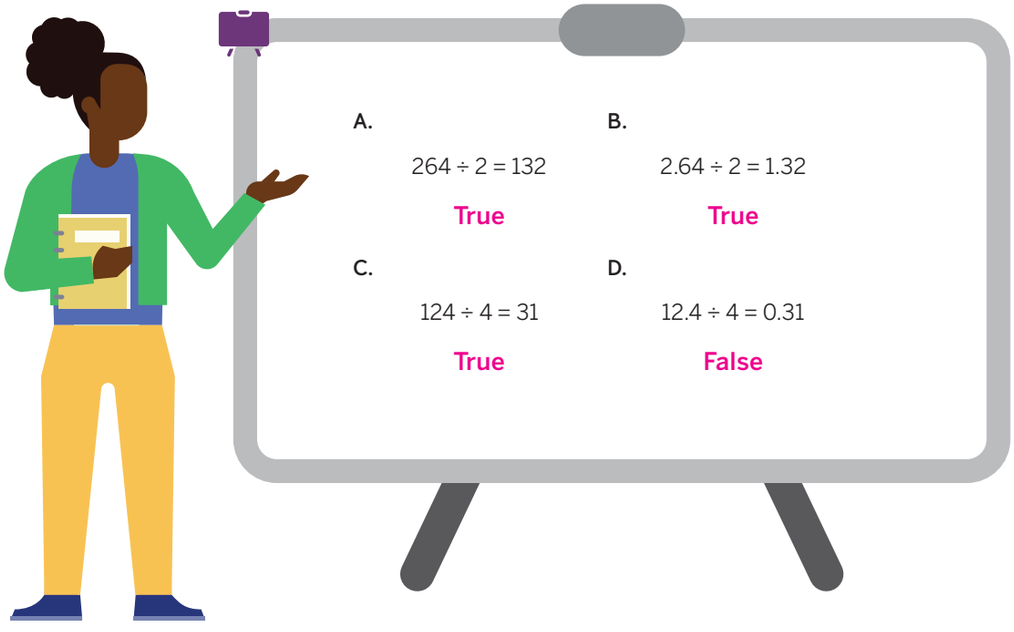
Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** and **write** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** and **write** using a variety of sentence types.	Students **listen** to spoken English and **speak** and **write** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

Presentation Screens

Warm-Up True or False? Fluency

Purpose: Students analyze equations involving division of whole numbers and division of decimals by whole numbers, without evaluating all expressions, to develop strategies for determining decimal point placement in the quotient.



Why these problems? These equations lend themselves to strengthening students' understanding of the connection between whole number division and dividing decimals, as well as where to place the decimal point in the quotient when dividing by whole numbers.

1 Launch

Use the True or False? routine.

Display 1 equation at a time.

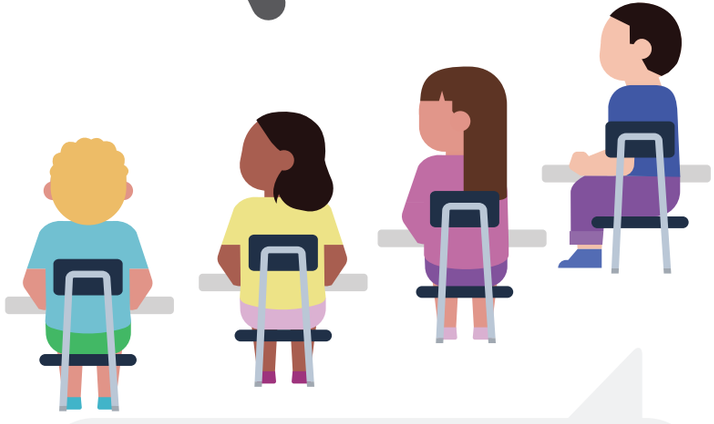
Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

Record 2 or 3 students' responses, asking for their reasoning and allowing others to agree or disagree. Keep each equation displayed as you progress to the next.

Repeat with each equation.

Ask, "How can you prove any of the statements are true or false without finding the value of the expressions?"



Students might say . . . ELPS 2.B, 2.C, 2.D, 2.E

A: True. 264 divided by 2 is 132.

B: True. 2.64 divided by 2 is 1.32 because 264 divided by 2 was 132 and you have to add the decimal back into the hundredths place value.

C: True. 4 goes into 124 thirty-one times.

D: False. 124 divided by 4 was 31, so 12.4 divided by 4 should be 3.1 because the decimal should be placed so that there is a tenths place value.

Independent | 15 min

Activity 1 Making Connections

Purpose: Students make connections to whole number division by explaining how they can use estimation and whole-number division strategies to solve for quotients of decimals divided by whole numbers.

Presentation Screens

Short on time? Consider omitting Problem 5 and making Problem 4 a discussion question.

1 Launch

Say, "Complete Problem 1 on your own. You will join a partner to discuss Problem 2. Then complete Problems 3–5 on your own."

EB **Emergent Bilinguals** To support students as they write their responses to Problem 4, consider asking, "Will you write to describe a process or to explain an idea? Will you write using a more formal or informal tone? What details can you add?" ELPS 4.F

2 Monitor

After students have completed **Problem 4,** refer to the Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What information does your estimate give you?"
- Ask, "What information does your solution to Problem 3 give you?"

3 Connect

MLR **MLR1: Stronger and Clearer Each Time** ELPS 1.E, 2.E

After students complete Problem 4, have them meet with 1–2 other students to share their responses. Encourage listeners to ask clarifying questions using stems, such as:

- "What do you mean by . . .?"
- "Can you tell me more about . . .?"

Have students revise their responses based on the feedback they receive.

Use the Think-Pair-Share routine. Ask, "How could you use what you discussed with your partner to create a set of steps for solving problems involving decimals divided by whole numbers?"

EB **Emergent Bilinguals** Invite students to restate the question in their own words and to ask any clarifying questions. Then invite them to rehearse their responses with a partner before sharing with the class. ELPS 1.E, 2.D, 2.F

Key Takeaway: Say, "You can divide a decimal by a whole number by first estimating the quotient. Next, divide as whole numbers. Then use place value understanding and your estimate to determine the size of the quotient."

Student Edition

Unit 4
Lesson
16

Name _____ Date _____

TEKS 5.1.B, 5.1.C, 5.1.G, 5.3.A, 5.3.G

Use What You Know

Let's estimate and solve for quotients of decimals and whole numbers.

Warm-Up eyes on teacher

I am a doer of math.
How can you learn from a mistake you might make when solving a math problem?

Activity 1 Making Connections

1. Estimate the quotient 32.8 ÷ 4. **Sample response shown.**

8

2. **Discuss** **Oral activity: No writing expected. Sample response shown.**
Explain how you know your estimate from Problem 1 is reasonable.

I know my estimate is reasonable because 8 times 4 is 32 and 32 is close to 32.8.

3. Solve for the quotient 328 ÷ 4 using any strategy.

Show your thinking.

Sample work shown.

$$4\overline{)328}\quad 82,\ -32,\ 08,\ -8,\ 0$$

answer: 82

Activity 1

Name _____ Date _____

Making Connections (continued)

4. How can you use your responses to Problems 1 and 3 to help you determine the quotient of 32.8 ÷ 4? **Sample response shown.**

I could use my answer from Problem 3 as my answer to the expression 32.8 ÷ 4 because I know 328 divided by 4 is 82, so that means 32 and 8 tenths divided by 4 would be 8 and 2 tenths. My estimate from Problem 1 was 8, so I know my answer is reasonable.

5. Estimate and then solve for the quotient 216.3 ÷ 7 using any strategy.
Sample estimate and work shown.

Show your thinking.

estimate: 210 ÷ 7 = 30

	30	0.9
7	210	6.3

answer: 30.9

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Explain that dividing by the whole number gives the quotient.	I know that 328 divided by 4 is 82, so that means 32 and 8 tenths divided by 4 would also be 82.	**Support** Ask, "How can you determine where to place the decimal point? How can you use your estimate to check the reasonableness of your answer?"
Explain that estimation can be used to determine the reasonableness of the quotient.	My estimate was 8, so I know that my quotient is correct because 8.2 is close to 8.	**Strengthen** Ask, "How is dividing without the decimal helpful when solving?"
Explain that dividing by the whole number gives the quotient, place value reasoning can be used to place the decimal, and estimation can be used to determine the reasonableness of the quotient.	I know that 328 divided by 4 is 82, so that means 32 and 8 tenths divided by 4 would be 8 and 2 tenths. My estimate was 8, so I know this is correct.	**Stretch** Ask, "How would the quotient change if you were dividing 32.88 by 4?"

Pairs | 20 min

Activity 2 Your Choice!

Purpose: Students estimate to determine whether their answer is reasonable. They solve for quotients of decimals divided by whole numbers using any strategy.

Presentation Screens

Materials

Lesson Resources:

- Provide students with access to the *Division Strategies* PDF (as needed).

1 Launch

Read aloud the directions.

Say, "Work with your partner to solve Problems 6–9 using any strategy."

A **Accessibility: Executive functioning** Provide students with the *Decimal Division Strategies* PDF that shows 2 examples of division strategies that they can use during the activity.

2 Monitor

After students have completed **Problem 7,** refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What is the closest whole number that can be equally divided by the divisor?"
- Ask, "What division strategy can you use that you already know?"

3 Connect

Invite students to share their responses and strategies for Problem 7. Select and sequence their responses in the order shown in the *Differentiation* table.

Use the Think-Pair-Share routine. Ask:

- "Which strategy do you prefer? Why?"
- "How is estimation helpful when dividing decimals by whole numbers?"

Key Takeaway: Say, "There are many strategies that you can use to divide a decimal by a whole number. Estimation can be used to determine whether your quotient is reasonable."

Student Edition

Activity 2

Name _____ Date _____

Your Choice!

Estimate the quotient. Then solve for the quotient using any strategy.
Sample estimates and work shown.

6 64.4 ÷ 7

Show your thinking.

estimate: 63 ÷ 7 = 9

$$\begin{array}{r} 9\,2 \\ 7\overline{)6\,4\,4} \\ -\,6\,3 \\ \hline 1\,4 \\ -\,1\,4 \\ \hline 0 \end{array}$$

or

7 × 9 = 63
1 = 10 tenths
14 tenths ÷ 7 = 2 tenths
9 + 2 tenths = 9.2

answer: 9.2

7 56.64 ÷ 12

Show your thinking.

estimate: 60 ÷ 12 = 5

12 × 4 = 48

$$\begin{array}{r} 5\,6 \\ -\,4\,8 \\ \hline 8 \end{array}$$

8 = 80 tenths
80 tenths + 6 tenths = 86 tenths
12 × 7 = 84
86 − 84 = 2 tenths
2 tenths = 20 hundredths
20 hundredths + 4 hundredths = 24 hundredths
12 × 2 = 24

answer: 4.72

Activity 2

Name _____ Date _____

Your Choice! (continued)

8 259.2 ÷ 8

Show your thinking.

estimate: 240 ÷ 8 = 30

	300	20	4
8	2,400	160	32

answer: 32.4

9 132.5 ÷ 25

Show your thinking.

estimate: 125 ÷ 25 = 5

	5	0.3
25	125	7.5

answer: 5.3

Presentation Screens

Differentiation | Teacher Moves

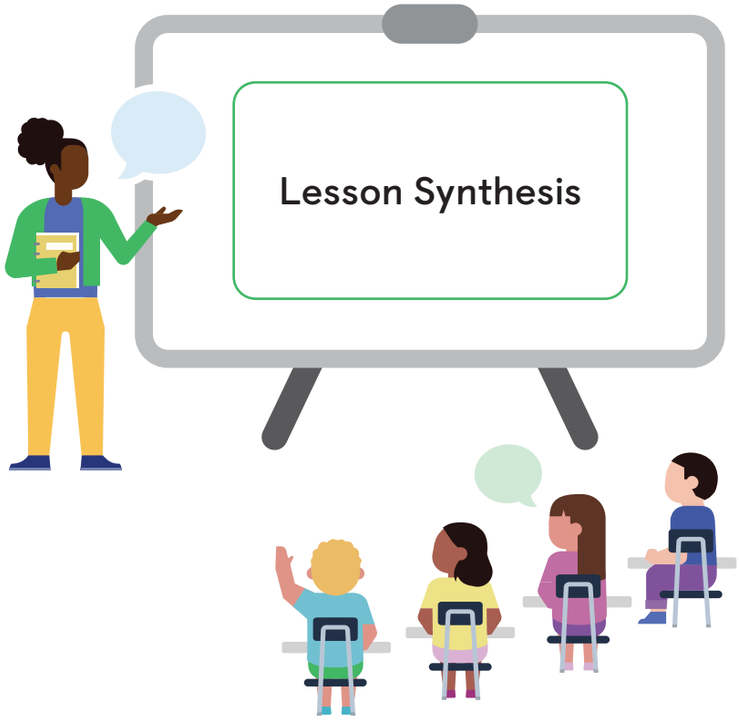
Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent and solve using a known strategy and name the quotient as a whole number.	$$\begin{array}{r} 4\,7\,2 \\ 12\overline{)5\,6\,6\,4} \\ -\,4\,8 \\ \hline 8\,6 \\ -\,8\,4 \\ \hline 2\,4 \\ -\,2\,4 \\ \hline 0 \end{array}$$	**Support** Ask, "When dividing a decimal by a whole number, the quotient should result in a decimal. What strategy can you use to identify the placement of the decimal point?"
Represent and solve using a known strategy and name the quotient as a decimal.	5 × 800 = 4800 5 × 70 = 840 5 × 2 = 24 800 + 70 + 2 = 872 $$\begin{array}{r} 5\,6\,6\,4 \\ -\,4\,8\,0\,0 \\ \hline 8\,6\,4 \\ -\,8\,4\,0 \\ \hline 2\,4 \end{array}$$	**Strengthen** Ask, "What is the most efficient strategy for you and why? What other strategies could you use?"

Whole Class | 10 min

Presentation Screens

Synthesis

Lesson Takeaway: Any strategy can be used to divide a decimal by a whole number. It is important to think about the size of the quotient and where to place the decimal point.



Use the Think-Pair-Share routine. Ask, "How could you use this estimate and whole number division to determine the quotient of this expression?"

Say, "When dividing a decimal by a whole number you can use any strategy. It is important to think about the size of the quotient and where to place the decimal point."

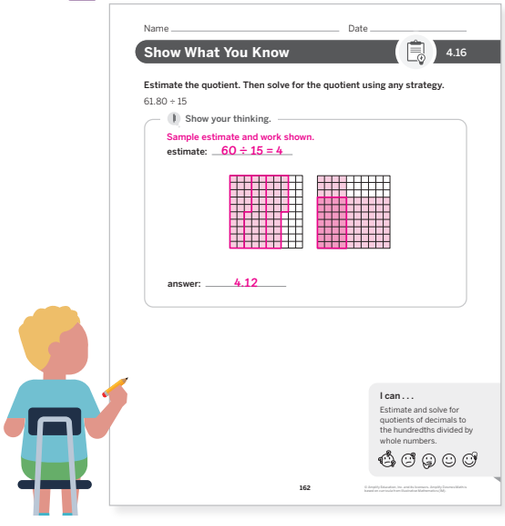
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.16

Estimate the quotient. Then solve for the quotient using any strategy.

61.80 ÷ 15

Show your thinking.

Sample estimate and work shown.

estimate: 60 ÷ 15 = 4

answer: 4.12

I can . . .

Estimate and solve for quotients of decimals to the hundredths divided by whole numbers.

162

Today's Goals

1. **Goal:** Estimate and solve for quotients of decimals to the hundredths divided by whole numbers.
   - In the *Show What You Know*, students estimated and then solved for a quotient of a decimal divided by a whole number using any strategy.
2. **Language Goal:** Explain how estimating can be a helpful strategy to determine the reasonableness of quotients for decimals divided by whole numbers. **(Listening, Speaking, and Writing)** ELPS 1.E, 2.E, 2.F, 4.D, 4.F

D **Differentiation** See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 16
Practice

Students using digital

Students using print

Summary 4.16

When dividing a decimal by a whole number, you can use any strategy to determine the quotient. It is important to think about the size of the quotient and where to place the decimal point. Estimating can help you determine whether the quotient is reasonable.

2.36 ÷ 2

Estimating 2 ÷ 2 = 1

The quotient should have a whole number in the ones place. The decimal should be placed after the whole number in the ones place.

Area Model

	1	0.18
2	2	0.36

Whole Number Division

```
  1 18
2)2 36
 -2
  03
 - 2
   16
 - 16
    0
```

Practice 4.16

1 Estimate the quotient 89.45 ÷ 5. Then solve for the quotient using any strategy. Sample estimate and work shown.

Show your thinking.

estimate: 90 ÷ 5 = 18

89 ÷ 5 = 17 R4
4 = 40 tenths
40 tenths ÷ 5 = 8 tenths
45 hundredths ÷ 5 = 9 hundredths
17 + 0.8 + 0.09 = 17.89

answer: 17.89

Practice 4.16

Name _____ Date _____

2 Solve for the quotient 91.98 ÷ 14.

Record your answer in the space provided.

6.57

3 A field trip costs $93.15 per class. If there are 23 students in each class and each student pays the same amount, how much will it cost each student to go on the field trip? Estimate the quotient. Then solve using any strategy. Sample estimate and work shown.

Show your thinking.

estimate: 100 ÷ 20 = 5

```
   405
23)9315
 -92
   11
 -  0
  115
 - 115
    0
```

answer: $4.05

Practice 4.16

Name _____ Date _____

4 Estimate the quotient of the expression 45.92 ÷ 16.

3

5 What is the quotient of the expression from Problem 4?

(A) 2.87 (B) 28.7
(C) 287 (D) 20.87

Spiral Review

6 A soccer game lasts 1 hour and 30 minutes. If the soccer game started at 6:15 p.m., what time did the game end?

(A) 7:15 p.m. (B) 7:30 p.m.
(C) 7:45 p.m. (D) 6:45 p.m.

7 A customer deposited $53.25 in the bank. Another customer deposited 50 quarters in the bank. A third customer deposited $47.90, but received $20.00 back in cash. How much money was deposited in the bank in all? Sample work shown.

Show your thinking.

```
  50
× 0.25
 250
+1000
 12.50
```

```
 47.90
-20.00
 27.90
```

```
  11
 53.25
 27.90
+12.50
 93.65
```

answer: $93.65

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 3, 4	1	5.3.A, 5.3.G
Test Practice	2	1	5.3.G
	5	1	5.3.G
Spiral Review			
	6	1	4.8.C
Fluency	7	1	5.3.K

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 16

Lesson Goal: Estimate and solve for quotients of decimals to the hundredths divided by whole number.

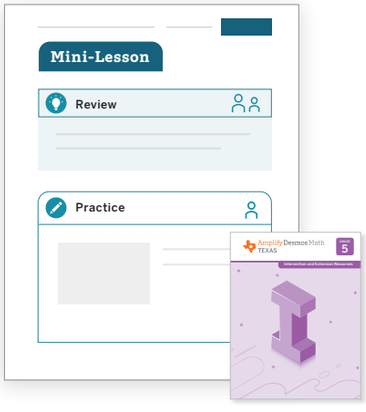
Support

Provide targeted intervention for students by using these resources.

If students estimate and solve for quotients of decimals divided by whole numbers and represent the quotient as a whole number:

Respond:

- Assign the *Using Whole Number Division to Divide Decimals* **Mini-Lesson. |** 15 min
- Revisit Lesson 15.



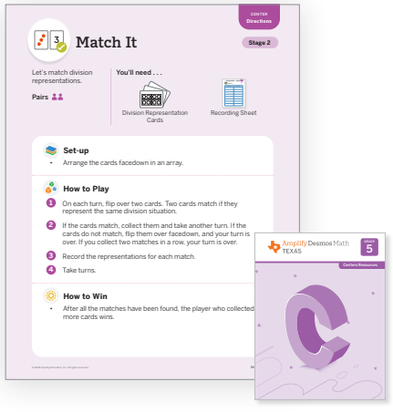
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students estimate and solve for quotients of decimals divided by whole numbers using known strategies:

Respond:

- Invite students to play these **Centers. |** 15 min
  Match It:
  - ***Division Representations***
  - *Multiplication and Division Problem*
- Have students complete **Lesson 16 Practice. |** 15 min
- **Item Bank**



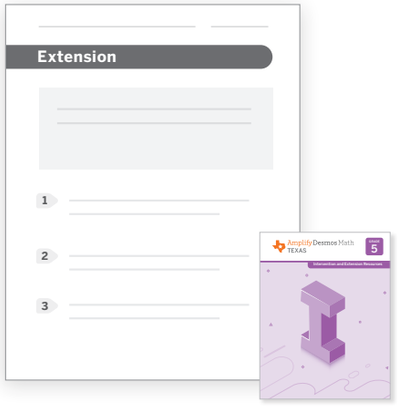
Stretch

Challenge students and extend their learning with these resources.

If students solve for quotients of decimals divided by whole numbers using known strategies and reason about their quotient using estimation:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 1 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

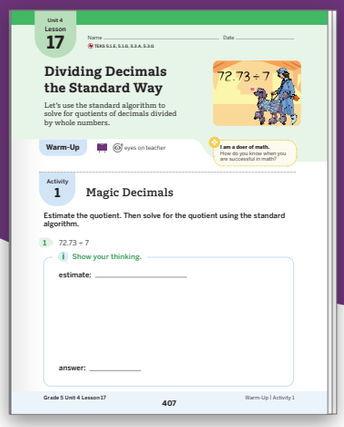
- English/Spanish cognates, e.g., estimate/estimar
- Frayer Model templates
- Vocabulary routines

Professional Learning

Reflect on how comfortable your students are asking questions of you and of each other. What can you do to encourage students to ask more questions?

Unit 4
Lesson
17

Student Edition pages and Presentation Screens support learning in this lesson.



Dividing Decimals the Standard Way

Dividing Decimals Using the Standard Algorithm

Let's use the standard algorithm to solve for quotients of decimals divided by whole numbers.

Key Concepts

Today's Goals

1. **Goal:** Solve for quotients of decimals to the hundredths divided by whole numbers using the standard algorithm.
2. **Language Goal:** Justify the placement of the decimal point within a quotient when using the standard algorithm. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students continue to make connections to whole number division as they estimate and solve for quotients of decimals divided by whole numbers using the standard algorithm. They make a conjecture about the placement of the decimal point when using the standard algorithm, noticing that it will always be directly aligned with the decimal point of the dividend. Students expand their work to include two-digit whole number divisors, noting that their conjecture remains true. **(TEKS 5.1.E, 5.1.G)**

Prior Learning

In Lesson 16, students related division involving decimals to whole number division as they estimated and solved for quotients of decimals divided by whole numbers.

Future Learning

In Grade 6, students will divide decimals, fractions, and whole numbers fluently.

Integrating Rigor in Student Thinking

- Students further their **conceptual understanding** of decimal place value by reasoning where the decimal point belongs in the quotient.
- Students **apply** their understanding of estimating to solve problems that involve dividing a decimal by a whole number.
- Students **apply** their understanding of determining quotients of up to four-digit dividends and two-digit whole number divisors to solve problems that involve dividing a decimal by a whole number.

Vocabulary

Review Vocabulary

algorithm

decimal

TEKS

Addressing

5.3.G

Solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm.

Also Addressing: **5.3.A**

Math Process Standards: 5.1.C, 5.1.D, 5.1.E, 5.1.G

ELPS: 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 4.C

Building On	Building Toward
5.3.C	**6.3.E**
4.4.E	

Building Math Identity

I am a doer of math.

How do you know when you are successful in math?

Invite students to reflect on this question as they complete this lesson.

Lesson at a Glance 60 min

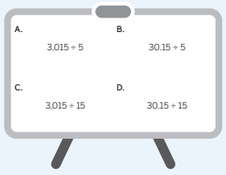
TEKS: 5.1.C, 5.1.D, 5.1.E, 5.1.G, 5.3.A, 5.3.G

Warm-Up Fluency

Whole Class | 10 min

Students use the **Number Talk** routine, in which they look for structure and use repeated reasoning based on their own previous strategies or the strategies of others as they study a sequence of division expressions involving two-digit divisors.

(TEKS 5.1.C, 5.1.D)



Activity 1

Pairs | 15 min

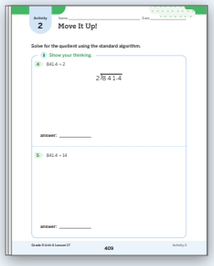
Students estimate and then solve for quotients of decimals divided by one-digit whole numbers using the standard algorithm. They use the **Think-Pair-Share** routine to make conjectures about the placement of the decimal point in quotients when using the standard algorithm to solve.

Materials: graph paper (as needed)

Activity 2

Pairs | 20 min

Students solve for quotients of decimals divided by two-digit divisors using the standard algorithm. Students use the **Think-Pair-Share** routine to explain that the placement of the decimal point does not change based on the digits in the divisor.



Synthesis

Whole Class | 10 min

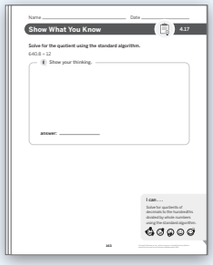
Students review and reflect on ways to represent division of decimals by whole numbers.

Show What You Know

Independent | 5 min

Students demonstrate their understanding by dividing a decimal dividend by a two-digit whole number divisor using the standard algorithm.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

Consider using the *Math Language Development Resources* with the **Activity 1, Monitor** to support math language acquisition.

- ✓ Cognates
- ✓ Sentence frames and word bank
- ✓ Frayer model

ELPS 1.E, 2.C, 2.D, 2.E, 2.F

Pre-Production	Beginning	Intermediate	High Intermediate	Advanced
Students **listen** to spoken English and **respond** using their primary languages and gestures.	Students **listen** to spoken English and **speak** using their primary languages, gestures, and single words or short phrases.	Students **listen** to spoken English and **speak** using short phrases or simple sentences.	Students **listen** to spoken English and **speak** using a variety of sentence types.	Students **listen** to spoken English and **speak** using longer sentences. Exemplar responses are provided.

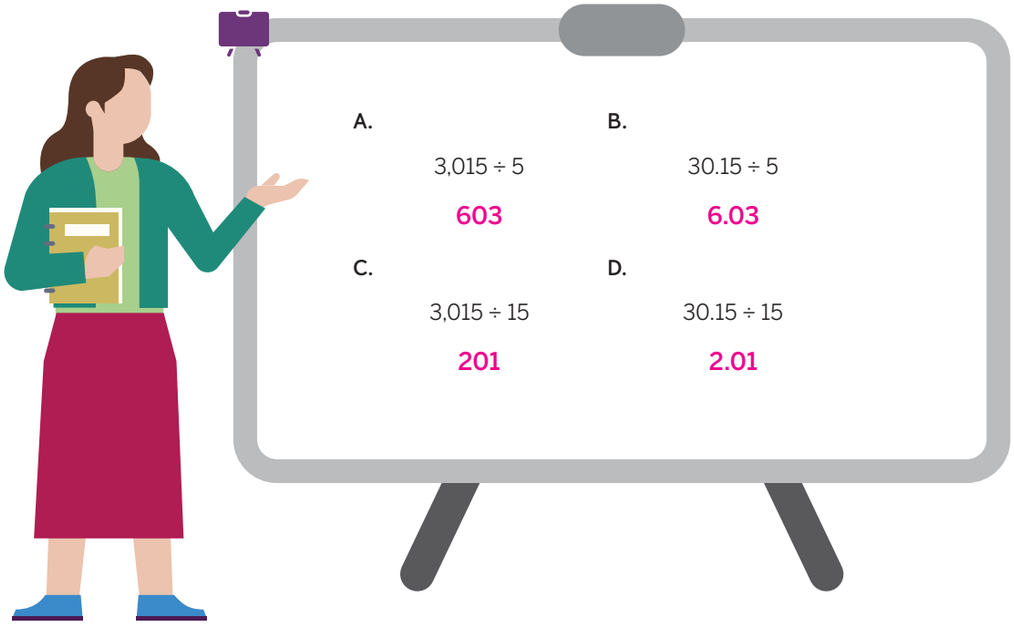
Whole Class | 10 min

Presentation Screens

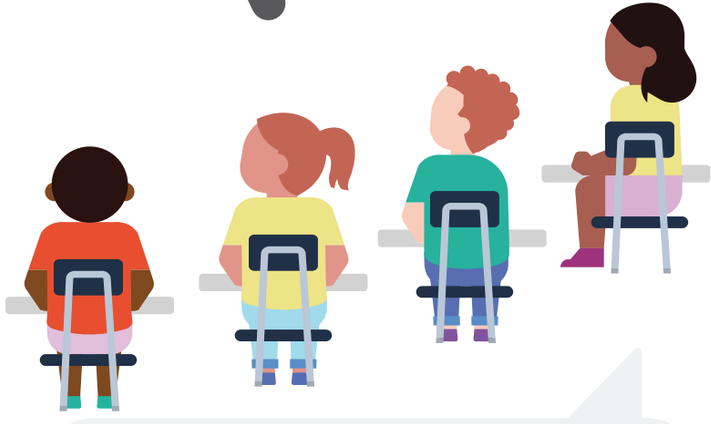
Warm-Up Number Talk

Fluency

Purpose: Students divide whole numbers and decimals to develop fluency and continue to develop strategies for determining where to place the decimal point.



Why these problems? These expressions lend themselves to developing proficiency dividing up to four-digit dividends by two-digit divisors.



1 Launch

Use the Number Talk routine.

Display 1 expression at a time.

Say, "Take your time to find the value mentally. Give me a signal when you have an answer and can explain how you determined it."

2 Connect

Record quotients and 2 or 3 strategies as students share, honoring all strategies and keeping expressions and work displayed.

Repeat with each expression, spending the most time discussing Expressions B and D.

Ask, "How did you determine the quotient using the whole number division expressions on Expressions A and C? How did you determine where to place the decimal point?"

Students might say . . . ELPS 2.C, 2.D, 2.E

A: *I know 5 × 600 is 3,000 and 5 × 3 is 15, so 600 plus 3 is 603.*

B: *Because 3,015 divided by 5 is 603, I know 30.15 divided by 5 is 6.03.*

C: *I know 3,000 divided by 15 is 200 and 15 divided by 15 is 1, so 200 plus 1 is 201.*

D: *3,015 divided by 15 is 201, so 30.15 divided by 15 is 2.01.*

Pairs | 15 min

Activity 1 Magic Decimals

Purpose: Students solve for quotients of decimals divided by whole numbers using the standard algorithm to make sense of the placement of the decimal point.

Presentation Screens

Materials

Classroom materials:

- Provide students with access to graph paper (as needed).

1 Launch

Say, "Work with your partner to solve Problems 1–3. You will estimate then solve using the standard algorithm. As you work, think about what you notice about the placement of the decimal point in each quotient."

A **Accessibility: Visual-spatial processing** Provide students with graph paper to help organize their division.

2 Monitor

After students have completed **Problem 1,** refer to the D **Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "How could you round the dividend so that it is easily divisible by the divisor?"
- Ask, "What is the first step when dividing using the standard algorithm?"

3 Connect

MLR **MLR8: Discussion Supports — Make a Conjecture** ELPS 2.B, 2.C, 2.D, 2.E

Use the Think-Pair-Share routine. Ask students to make a conjecture about the placement of the decimal point when solving using the standard algorithm. Have them share their conjectures with a partner and discuss the following questions:

- "How do you know whether your conjecture is always true?"
- "Are there any examples that show this conjecture is false?"

EB **Emergent Bilinguals** Encourage students to record what they discussed with a partner about decimal point placement when solving using the standard algorithm using drawings, words, or a graphic organizer. ELPS 4.C

Key Takeaway: Say, "When dividing decimals using the standard algorithm, the decimal point in the quotient is placed directly above the decimal point in the dividend."

Student Edition

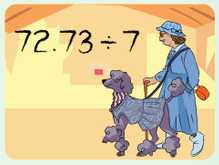
Unit 4
Lesson
17

Name _____ Date _____

TEKS 5.1.E, 5.1.G, 5.3.A, 5.3.G

Dividing Decimals the Standard Way

Let's use the standard algorithm to solve for quotients of decimals divided by whole numbers.



Warm-Up eyes on teacher

I am a doer of math.
How do you know when you are successful in math?

Activity
1

Magic Decimals

Estimate the quotient. Then solve for the quotient using the standard algorithm. Sample estimates shown.

1 72.73 ÷ 7

Show your thinking.

estimate: 70 ÷ 7 = 10

```
      1039
   7)7273
   - 7
     027
   -  21
      63
   -  63
       0
```

answer: 10.39

Activity
1

Name _____ Date _____

Magic Decimals (continued)

2 23.96 ÷ 4

Show your thinking.

estimate: 24 ÷ 4 = 6

```
      599
   4)2396
   -20
     39
   - 36
     36
   - 36
      0
```

answer: 5.99

3 392.8 ÷ 8

Show your thinking.

estimate: 400 ÷ 8 = 50

```
      491
   8)3928
   -32
     72
   - 72
     08
   -  8
      0
```

answer: 49.1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Divide as whole numbers and represent the quotient as a whole number.	1039 7)7273 −7 027 − 21 63 − 63 0	**Support** Ask, "How can you use your estimation to determine whether your answer is reasonable?"
Divide as whole numbers and represent the quotient as a decimal.	1039 7)7273 −7 027 − 21 63 − 63 0	**Strengthen** Ask, "How do you know where to place the decimal point? Will this always be true?"

Pairs | 20 min

Activity 2 Move It Up!

Purpose: Students apply their understanding of dividing a decimal by a one-digit whole number divisor using the standard algorithm to solve for quotients of decimals divided by two-digit whole number divisors.

Presentation Screens

Short on time? Consider omitting Problem 7.

1 Launch

Display Problem 4.

Ask, "Before you solve, you can determine where the decimal point will go. In this equation, where would the decimal point in the quotient be placed? How do you know?"

Say, "Work with your partner to solve Problems 4–7 using the standard algorithm."

2 Monitor

After students have completed **Problem 5,** refer to the **D Differentiation | Teacher Moves** table on the following page.

If students need help getting started . . .

- Ask, "What is the first step when dividing using the standard algorithm?"
- Ask, "How can you use what you did in Problem 1 to help get you started?"

3 Connect

Display Problems 4 and 5.

Use the Think-Pair-Share routine. Ask:

- "What do you notice about the 2 problems?"
- "How does a two-digit divisor affect the quotient?"
- "How does a two-digit divisor affect the placement of the decimal point?"
- "Is the placement of the decimal point affected differently with a one-digit divisor? How do you know?"

Key Takeaway: Say, "The standard algorithm is useful when dividing decimals by whole numbers because no matter how many digits there are in the divisor or dividend, the steps to solve remain the same."

Student Edition

Activity 2

Name _____ Date _____

Move It Up!

Solve for the quotient using the standard algorithm.

Show your thinking.

4 841.4 ÷ 2

```
  420.7
2)841.4
 -8
  04
 - 4
  01
 -  0
   14
 -  14
    0
```

answer: 420.7

5 841.4 ÷ 14

```
   60.1
14)841.4
 -84
  01
 -  0
   14
 -  14
    0
```

answer: 60.1

Activity 2

Name _____ Date _____

Move It Up! (continued)

Show your thinking.

6 64.89 ÷ 21

```
   3.09
21)64.89
 -63
   18
 -  0
   189
 - 189
    0
```

answer: 3.09

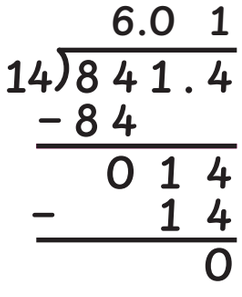
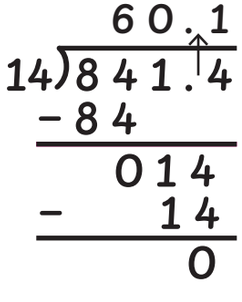
7 988.8 ÷ 16

```
   61.8
16)988.8
 -96
   28
 - 16
   128
 - 128
    0
```

answer: 61.8

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Divide the divisor equally into the dividend using the standard algorithm and place the decimal point in the quotient without using the dividend to determine placement.		**Support** Ask, "How can you use estimation or the dividend to determine if the placement of the decimal is accurate?"
Divide the divisor equally into the dividend using the standard algorithm and place the decimal point in the quotient based on the placement of the decimal point in the dividend.		**Strengthen** Ask, "How did you determine where to place the decimal point? How can you determine if your answer is reasonable?" **Stretch** Ask, "How would the quotient be affected if the decimal point in the dividend was shifted 1 place to the left?"

Whole Class | 10 min

Presentation Screen

Synthesis

Lesson Takeaway: Using the standard algorithm to solve division of decimals by whole numbers helps to organize all of the partial quotients and decomposed units in an efficient way. Estimating before solving helps ensure the answer is reasonable.

Ask, "Where do you see each model represented in the standard algorithm?"

Say, "Using the standard algorithm to divide decimals by whole numbers helps to organize all of the partial quotients and decomposed units in an efficient way."

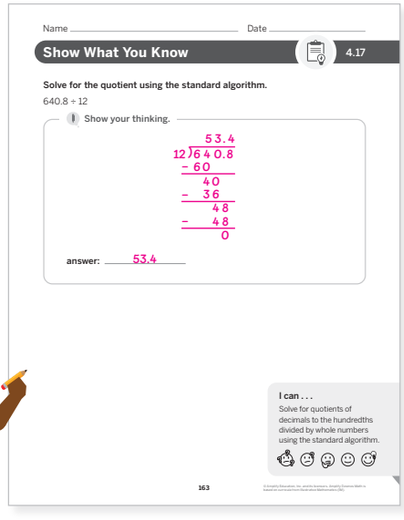
Invite students to refer to the **Summary** during Practice or anytime during the year.

Show What You Know

Independent | 5 min

Students using digital

Show What You Know PDF


Name _____ Date _____

Show What You Know 4.17

Solve for the quotient using the standard algorithm.

640.8 ÷ 12

Show your thinking.

53.4
12)640.8
−60
40
−36
48
−48
0

answer: 53.4

I can . . .
Solve for quotients of decimals to the hundredths divided by whole numbers using the standard algorithm.

163

Today's Goals

1. **Goal:** Solve for quotients of decimals to the hundredths divided by whole numbers using the standard algorithm.
   - In the *Show What You Know*, students used the standard algorithm to solve for the quotient of a decimal divided by a whole number.
2. **Language Goal:** Justify the placement of the decimal point within a quotient when using the standard algorithm. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Differentiation See the last page of the lesson for differentiation and Math Language Development support.

Practice

Independent

Provide students with sufficient practice to build and reinforce their conceptual understanding, fluency, and application of mathematical topics, assessment practice, and ongoing spiral review.

Lesson 17
Practice

Students using digital

Students using print

Summary 4.17

Using the standard algorithm to divide decimals by whole numbers helps to organize all of the partial quotients and decomposed units in an efficient way. Estimating first helps you monitor your work as you solve and check that the place value of the decimal point is accurate.

Estimate
360 ÷ 15 = 24

Is the quotient reasonable based on the estimate?
☑ yes
☐ no

Standard Algorithm

$$\begin{array}{r} 24.5 \\ 15\overline{)367.5} \\ -30 \\ \hline 67 \\ -60 \\ \hline 75 \\ -75 \\ \hline 0 \end{array}$$

Practice 4.17

1 Estimate the quotient 76.86 ÷ 18. Then solve for the quotient using the standard algorithm. Sample estimate shown.

Show your thinking.

$$\begin{array}{r} 4.27 \\ 18\overline{)76.86} \\ -72 \\ \hline 48 \\ -36 \\ \hline 126 \\ -126 \\ \hline 0 \end{array}$$

estimate: 72 ÷ 18 = 4 answer: 4.27

Practice 4.17

Name _____ Date _____

For Problem 2, use the number bank.

Number Bank					
306	30.6	3.06	30.06	2.4	3

2 Make the equation true. 24.48 ÷ 8 = 3.06

3 The cafeteria sells frozen yogurt on Fridays. They have 313.5 pints of frozen yogurt to sell. If there are 11 lunch groups and they want to sell an equal amount to each lunch group, how many pints of frozen yogurt can they sell to 1 lunch group? Solve using the standard algorithm.

Show your thinking.

$$\begin{array}{r} 28.5 \\ 11\overline{)313.5} \\ -22 \\ \hline 93 \\ -88 \\ \hline 55 \\ -55 \\ \hline 0 \end{array}$$

answer: 28.5 pints

4 A piece of fabric measuring 4.12 yards was cut into 4 equal-sized pieces. What size is each piece of fabric?

(A) 103 yards (B) 1 yard
(C) 10.3 yards (D) 1.03 yards

Practice 4.17

Name _____ Date _____

Spiral Review

For Problems 5 and 6, use the conversion table.

Weight and Mass	
1 ton (T)	2,000 pounds (lb)
1 pound (lb)	16 ounces (oz)

5 A garbage truck collects 3 tons and 27 pounds of garbage in 1 week. How many pounds of garbage do they collect?

(A) 3,027 pounds (B) 6,027 pounds
(C) 6,000 pounds (D) 480 pounds

6 A puppy weighed 2 pounds and 4 ounces when it was first born. A month later, the puppy weighed 4 pounds and 1 ounce. How much weight did the puppy gain in pounds and ounces?

Show your thinking.

Sample work shown.

4 lb 1 oz = 3 lb 17 oz

3 lb 17 oz
−2 lb 4 oz
1 lb 13 oz

answer: 1 pound and 13 ounces

For Problems 7–10, determine the value of the expression.

7 2 − 0.93 1.07 8 3.45 − 1.23 2.22

9 11.25 − 0.15 11.10 10 0.45 − 0.39 0.06

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1	1	5.3.A, 5.3.G
Test Practice	2	1	5.3.G
	3, 4	1	5.3.G
Spiral Review			
	5, 6	1	4.8.C
Fluency	7–10	1	5.3.K

Need more Practice?

Additional practice can be found in the **Practice Resources, Intervention and Extension Resources,** and online resources (item banks, Boost Personalized Learning, and Fluency Practice).

Differentiation Use after Lesson 17

Lesson Goal: Solve for quotients of decimals to the hundredths divided by whole numbers using the standard algorithm.

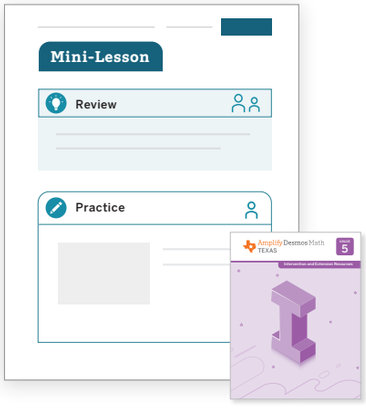
Support

Provide targeted intervention for students by using these resources.

If students divide decimals by whole numbers using the standard algorithm and represent the quotient as a whole number:

Respond:

- Assign the *Dividing Decimals Using the Standard Algorithm* **Mini-Lesson. |** 15 min
- Revisit Lesson 16.



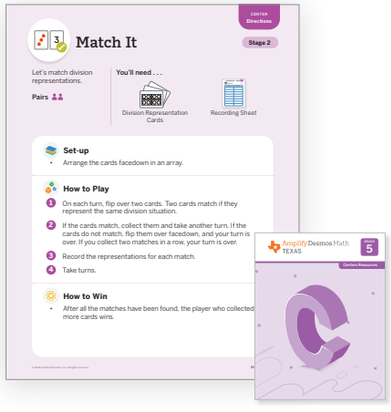
Strengthen

Reinforce students' understanding of the concepts assessed by using these resources.

If students divide decimals by whole numbers using the standard algorithm and use estimation to place the decimal point in the quotient:

Respond:

- Invite students to play these **Centers. |** 15 min
  Match It:
  - *Division Representations*
  - ***Multiplication and Division Problem***
- Have students complete **Lesson 17 Practice. |** 15 min
- **Item Bank**



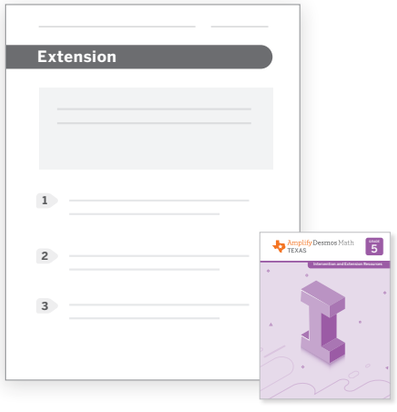
Stretch

Challenge students and extend their learning with these resources.

If students divide decimals by whole numbers using the standard algorithm and use the dividend to reason about the placement of the decimal point in the quotient:

Respond:

- Invite students to explore the **Sub-Unit 3 Extension Activities. |** 15 min
- Revisit Activity 2 and invite students to respond to the **Stretch** question from the *Differentiation: Teacher Moves* table. **|** 5 min



Support, *Strengthen*, and *Stretch* learning by assigning these digital resources that adjust to each student's current level of skill and understanding.
• Boost Personalized Learning • Fluency Practice • Math Adventures

Math Language Development

EB Use the **Math Language Development Resources** for further language support with all your students, including those building English proficiency.

- English/Spanish cognates, e.g., *algorithm/algorimo*
- Frayer Model templates
- Vocabulary routines

Professional Learning

How can you continue to support students' understanding of multi-digit division involving decimal dividends throughout the next units?

Notes:

Watch Your Knowledge Grow (Optional)

Purpose: At the beginning of the unit, students rated their understanding of the concepts they were about to explore in the unit. Return to this page at the end of the unit and invite them to rate their understanding again to see how their knowledge has grown.

Invite students to return to the *Watch Your Knowledge Grow* page at the beginning of their Student Edition for this unit.

Say, "These were the math concepts that you explored in this unit." Read aloud, or ask a student volunteer to read aloud, the I can statements.

Invite students to rate their understanding of each concept now that they have completed the unit. Then invite them to compare their new understanding to how they rated it at the beginning of the unit. Consider pairing students with a partner and inviting them to discuss these questions:

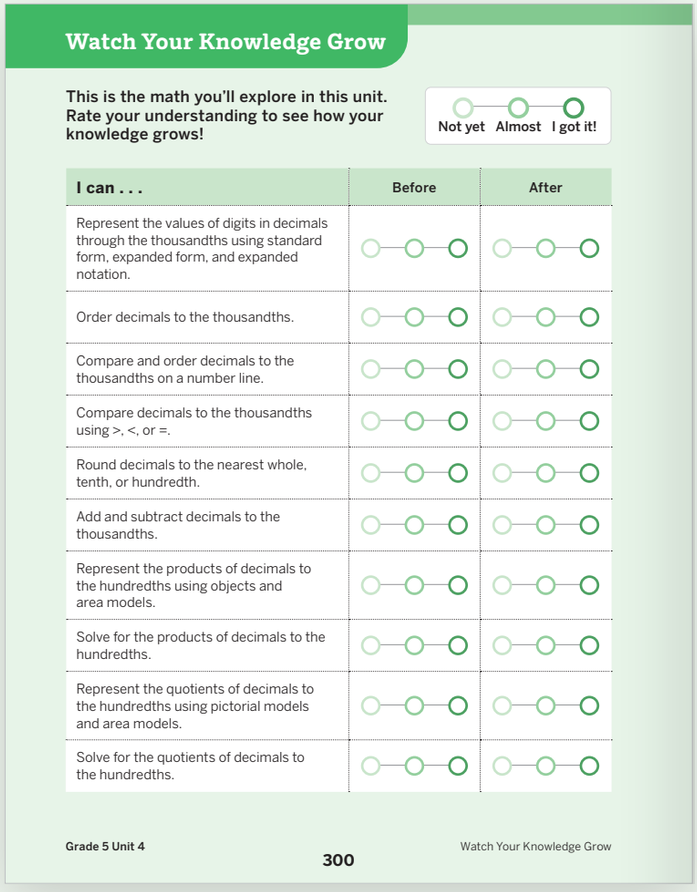
- "What do you notice? What do you wonder?"
- "How did your knowledge grow in this unit?"
- "What questions do you still have?"

EB **Emergent Bilinguals** Consider displaying sentence frames, such as:

- "I notice _____."
- "I wonder _____."
- "I learned about _____."
- "I still have questions about _____."

ELPS 1.E, 2.C, 2.E

Math Identity and Community Celebrate the growth of student knowledge throughout the unit, as well as any questions that students still may have about the math concepts they explored. Remind students that it is a normal part of learning to continue to have questions. If you displayed a chart in prior units of students' questions, refer back to it and ask if any of their questions from the prior units have been answered. Celebrate any new growth in knowledge, as well as any additional questions that may get added to the chart for this unit!



Watch Your Knowledge Grow

This is the math you'll explore in this unit. Rate your understanding to see how your knowledge grows!

Not yet Almost I got it!

I can . . .	Before	After
Represent the values of digits in decimals through the thousandths using standard form, expanded form, and expanded notation.		
Order decimals to the thousandths.		
Compare and order decimals to the thousandths on a number line.		
Compare decimals to the thousandths using >, <, or =.		
Round decimals to the nearest whole, tenth, or hundredth.		
Add and subtract decimals to the thousandths.		
Represent the products of decimals to the hundredths using objects and area models.		
Solve for the products of decimals to the hundredths.		
Represent the quotients of decimals to the hundredths using pictorial models and area models.		
Solve for the quotients of decimals to the hundredths.		

Grade 5 Unit 4 300 Watch Your Knowledge Grow

Notes:

Assess and Respond

Support, strengthen, and stretch learning by assigning these digital resources that adjust to each student's current level of skill and understanding: • **Boost Personalized Learning** • **Fluency Practice** • **Math Adventures**

End-of-Unit Assessment

Independent | 45 min

Facilitation: Assign the End-of-Unit Assessment to learn about your students' understanding of concepts and skills in this unit. There are two forms of the End-of-Unit Assessment: Forms A and B.

TEKS
(S) = Supporting standard
(R) = Readiness standard

Item Analysis, Forms A and B

Problem(s)	Concept or skill	Addressed in	DOK	TEKS
1	Comparing decimals to the thousandths	Lesson 6	1	5.2.B *(R)* 5.1.F
2	Rounding decimals	Lesson 7	1	5.2.C *(S)* 5.1.F
3, 4	Adding and subtracting decimals to the hundredths	Lesson 9	1	5.3.K *(R)* 5.1.G
5	Writing a decimal in expanded form	Lesson 4	1	5.2.A *(S)* 5.1.E
6	Representing multiplying decimals using pictorial models	Lesson 12	1	5.3.D *(S)*, 5.3.E *(R)*
7	Multiplying decimals	Lesson 13	1	5.3.D *(S)*, 5.3.E *(R)* 5.1.C, 5.1.E
8	Dividing decimals	Lesson 17	1	5.3.A *(S)*, 5.3.G *(R)* 5.1.B
9	Representing decimal division with models	Lesson 14	1	5.3.A *(S)*, 5.3.G *(R)*
Extended Response				
10, 11	Solving multi-step problems with decimal operations	Lesson 11	2	5.3.E *(R)*, 5.3.K *(R)* 5.1.A, 5.1.B

Assessment Resources

- Student Print Assessments (Forms A and B)
- Answer Keys and Rubrics

Differentiation Resources

Intervention and Extension Resources include:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

If students need further review or practice with concepts or skills from Unit 4, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

Name _____ Date _____

End-of-Unit Assessment

Unit 5.4

1 Select **THREE** comparison statements that are true.

(A.) 1.000 = 1 B. 0.99 > 1 (C.) 1.53 < 1.62
(D.) 813.8 > 388.1 E. 0.001 = 0.01 F. 0.208 > 0.45

2 Round 1.357 to the nearest tenth.

1.4

For Problems 3 and 4, determine the value of the expression.
Sample work shown.

Show your thinking.

3 613.5 + 7.68

```
  11
 613.50
+  7.68
 621.18
```

answer: 621.18

4 64.38 – 17.9

```
  5  13 13
 6̸  4̸. 3̸ 8
- 1  7. 9  0
  4  6. 4  8
```

answer: 46.48

5 Write 6.203 in expanded form. Sample response shown.

(6 × 1) + (2 × 0.1) + (3 × 0.001)

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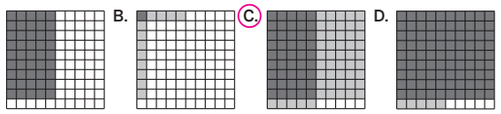
Name _____ Date _____

End-of-Unit Assessment (continued)

6 Which model represents the equation 0.9 × 0.5 = 0.45?

A. B. (C.) D.



7 Determine the value of the expression 3.5 × 0.7. Sample work shown.

Show your thinking.

	3	0.5
0	0	0
0.7	2.1	0.35

```
  2 . 10
+ 0 . 35
  2 . 45
```

answer: 2.45

8 Estimate the quotient. Then use the standard algorithm to determine the quotient. Sample estimate and work shown.

74.25 ÷ 15

Show your thinking.

estimate: 75 ÷ 15 = 5

```
   4.95
15|74.25
 - 60
   142
 - 135
    75
 -  75
     0
```

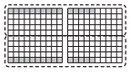
answer: 4.95

Name _____ Date _____

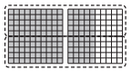
End-of-Unit Assessment (continued) Unit 5.4

9 The local pizza shop uses 1.5 cups of cheese when making 2 pizzas. Which model shows how much cheese is on each pizza?

A. B.



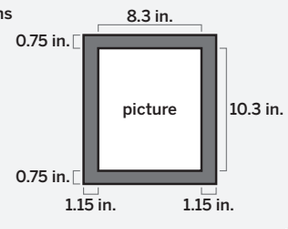
(C.) D.



For Problems 10 and 11, you can use this rubric to help you. Place a check mark as you complete each part.

- ☐ Analyze the given information.
- ☐ Come up with a plan.
- ☐ Determine your solution.
- ☐ Justify your solution, using math language from the unit.
- ☐ Read your response. Does your solution make sense?

A rectangular picture frame contains a picture inside the frame. Use the image for Problems 11 and 12.
Sample work shown.



Name _____ Date _____

End-of-Unit Assessment (continued) Unit 5.4

10 What is the area of the picture only?

Show your thinking.

Sample work shown.

$$10.3 \times 8.3$$
$$= \frac{103}{10} \times \frac{83}{10} = \frac{8,549}{100}$$
$$= 85.49$$

answer: 85.49 square inches

11 What is the area of the frame around the picture? Sample work shown.

Show or explain your thinking.

First, I found the length of the frame: 1.15 + 1.15 + 8.3 = 10.6. Next, I found the width of the frame: 10.3 + 0.75 + 0.75 = 11.8. Then I used the length and width to determine the area of the frame: 10.6 × 11.8 = 125.08. Lastly, I subtracted the area of the picture: 125.08 - 85.49 = 39.59.

answer: 39.59 square inches

Name _____ Date _____

End-of-Unit Assessment

Unit 5.4

1 Select **THREE** comparison statements that are true.

(A.) 2.000 = 2 (B.) 924.8 > 499.2 C. 0.002 = 0.02

D. 0.88 > 1 (E.) 0.42 < 0.51 F. 0.309 > 0.56

2 Round 1.468 to the nearest tenth.

1.5

For Problems 3 and 4, determine the value of the expression.
Sample work shown.

Show your thinking.

3 724.6 + 8.79

11
724.60
+ 8.79
733.39

answer: 733.39

4 75.49 – 18.9

6 14 14
7 5 . 4 9
– 1 8 . 9 0
5 6 . 5 9

answer: 56.59

5 Write 7.304 in expanded form. **Sample response shown.**

(7 × 1) + (3 × 0.1) + (4 × 0.001)

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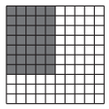
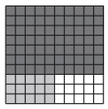
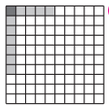
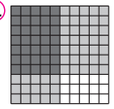
Name _____ Date _____

End-of-Unit Assessment (continued)

6 Which model represents the equation 0.7 × 0.5 = 0.35?

A.  B.  C.  (D.) 

7 Determine the value of the expression 4.5 × 0.6. **Sample work shown.**

Show your thinking.

	4	0.5
0	0	0
0.6	2.4	0.30

2 . 40
+ 0 . 30
2 . 70

answer: 2.70

8 Estimate the quotient. Then use the standard algorithm to determine the quotient. **Sample estimate and work shown.**

80.74 ÷ 22

Show your thinking.

estimate: 80 ÷ 20 = 4

3.67
22|80.74
– 66
147
– 132
154
– 154
0

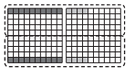
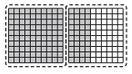
answer: 3.67

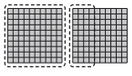
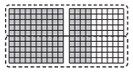
Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.4

9 The local pizza shop uses 1.4 cups of sauce when making 2 pizzas. Which model shows how much sauce is on each pizza?

A.  B. 

C.  (D.) 

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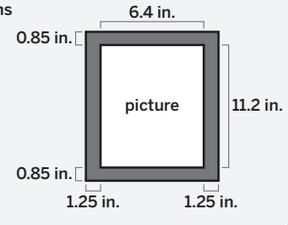

Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.4

10 What is the area of the picture only?

Show your thinking.

Sample work shown.

11.2×6.4

$= \frac{112}{10} \times \frac{64}{10} = \frac{7{,}168}{100}$

$= 71.68$

answer: 71.68 square inches

11 What is the area of the frame around the picture? **Sample work shown.**

Show or explain your thinking.

First, I found the length of the frame: 1.25 + 1.25 + 6.4 = 8.9. Next, I found the width of the frame: 11.2 + 0.85 + 0.85 = 12.9. Then I used the length and width to determine the area of the frame: 12.9 × 8.9 = 114.81. Lastly, I subtracted the area of the picture: 114.81 – 71.68 = 43.13.

answer: 43.13 square inches

D Differentiation (End-of-Unit Assessment)

To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Unit.

Sub-Unit Goal(s)	Problem(s)	Respond to Student Thinking
Sub-Unit 1: • Read, write, and represent decimals to the thousandths, including in expanded form and expanded notation. • Compare and order two decimals to the thousandths using the symbols >, <, or =. • Round decimals to tenths or hundredths. • Add and subtract decimals to the hundredths using strategies based on place value.	1	**Support** • **Mini-Lesson:** *Comparing Decimals to the Thousandths* (ML 4.06) • **Center:** *Greatest of Them All, Decimals* • **Teacher Move:** Consider revisiting Lesson 6.
	2	**Support** • **Mini-Lesson:** *Rounding Decimals* (ML 4.07) • **Center:** *Mystery Number, Rounding Decimals*
	3, 4	**Support** • **Mini-Lesson:** *Solving Real-World Problems Involving Adding and Subtracting Decimals* (ML 4.09) • **Center:** *Jump the Line, Add and Subtract Tenths and Hundredths*
	5	**Support** • **Teacher Move:** Invite students to review the problem and then provide additional opportunities to represent the value in expanded form. • **Emergent Bilinguals** Consider allowing students to use a place value chart to represent the value and then orally explain their response. **ELPS 3.E, 3.F**

Sub-Unit 2: Multiply decimals with products resulting in the hundredths using place value reasoning and properties of operations.	6, 7	**Support**
		• **Mini-Lessons:**
		  • *Multiplying Decimals Less Than 1* (ML 4.12)
		  • *Multiplying Two Decimals* (ML 4.13)
		• **Center:** *Mystery Number, Decimals*
		• **Teacher Moves:**
		  • For Problem 6, review the problem by using the hundredths models. Then provide additional opportunities for students to determine the value of a multiplication expression with 2 decimals.
		  • For Problem 7, consider revisiting Lesson 13.
		• **Emergent Bilinguals** For Problem 6, invite students to use colored pencils to color-code the 2 factors to help make connections to the model.
		ELPS 3.E, 3.F

	10, 11	**Support** • **Mini-Lesson:** *Multiplying Two Decimals* (ML 4.13) • **Teacher Move:** Review the formula to solve for the area. Then provide additional opportunities for students to solve by multiplying 2 decimal sides.

Sub-Unit 3: Divide decimals of up to 4 digit dividends with quotients resulting in the hundredths using place value reasoning and properties of operations using objects, area models, and the standard algorithm.	8, 9	**Support**
		• **Teacher Moves:**
		  • For Problem 8, consider revisiting Lessons 16 and 17.
		  • For Problem 9, consider revisiting Lesson 14.