UNIT 3

Multi-Digit Multiplication and Division and Financial Literacy

Essential Questions

- What strategies for multiplication work no matter how many digits are in the factors?
- What strategies for division work no matter how many digits are in the dividend and divisor?
- Why is it helpful to keep track of your spending decisions?

Explore: Estimation Station
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: Andrea
In this story, Gil learns the value of thinking differently from his cousin Andrea.

Focus on the TEKS

TEKS

Addressing

5.3.A, 5.3.B, 5.3.C, 5.3.K, 5.4.B, 5.4.F, 5.4.H, 5.10.A, 5.10.B, 5.10.C, 5.10.D, 5.10.E, 5.10.F

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

Students use the standard algorithm to multiply a three-digit whole number by a two-digit whole number. They divide whole numbers up to 4 digits by two-digit divisors using strategies based on place value and properties of operations. Students see that parentheses and brackets are grouping symbols that indicate what must be evaluated first and apply this to solving story problems and interpreting and comparing equations.

Students define **income**, **payroll**, **sales**, and **property taxes** and explain the difference between **gross** and **net income**. Students develop a system for keeping and using **financial records**, balance a simple **budget**, and describe actions they can take when expenses exceed income. They compare the advantages and disadvantages of various payment methods, including **checks**, **credit cards**, **debit cards**, and **electronic payments**.



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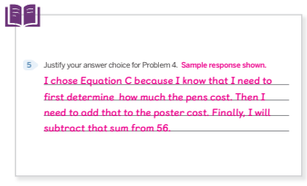
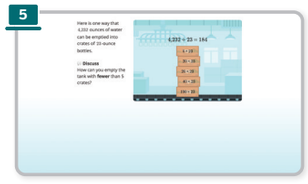
Connections and Coherence

Spotlight on Connecting the Content and Process Standards

Students engage in these Mathematical Process Standards as they . . .	
5.1.A	Apply their understanding of the different tax types to solve real-world problems involving net and gross income. **(Lesson 14, Activity 2)** **TEKS 5.10.A, 5.10.B**
5.1.B	Analyze given information in story problems involving multi-digit division, develop a plan for solving, and evaluate the reasonableness of quotients. **(Lesson 7, Activity 1)** **TEKS 5.3.A, 5.3.C**
5.1.C	Select mental math as a strategy to solve for the products of multi-digit number multiplication problems. **(Lesson 6, Activity 2)** **Building Toward: TEKS 5.3.C**
5.1.D	Communicate mathematical reasoning by explaining how a story problem can be represented by a given equation. **(Lesson 11, Activity 1)** **TEKS 5.4.B**  5 Justify your answer choice for Problem 4. Sample response shown. I chose Equation C because I know that I need to first determine how much the pens cost. Then I need to add that to the poster cost. Finally, I will subtract that sum from 56.
5.1.E	Use representations of water tanks to determine partial quotients. **(Lesson 8, Activity 1)** **TEKS 5.3.C**  5
5.1.F	Analyze the relationship between the place value of factors in multi-digit multiplication problems to apply the Distributive Property to multiply. **(Lesson 3, Activity 1)** **TEKS 5.3.A**
5.1.G	Use the *What Do You Know About___?* routine in which they compare partial products strategies. **(Lesson 3, Warm Up)** **TEKS 5.3.C**

Coherence

Prior Learning

- Students used strategies, including the standard algorithm, to represent and solve for the product of 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.C, 4.4.D**
- Students used strategies, including the standard algorithm, to represent and solve for the quotient of up to a four-digit dividend by a one-digit divisor, including interpreting remainders. **(Grade 4)** **TEKS 4.4.E, 4.4.F, 4.4.H**
- Students distinguished between fixed and variable expenses. **(Grade 4)** **TEKS 4.10.A**

Future Learning

- Students will multiply and divide positive rational numbers fluently. **(Grade 6)** **TEKS 6.3.E**
- Students will distinguish between debit cards and credit cards. **(Grade 6)** **TEKS 6.14.B**
- Students will balance a check register that includes deposits, withdrawals, and transfers. **(Grade 6)** **TEKS 6.14.C**

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

Unit at a Glance

Explore

Estimation Station: Launch the unit with a non-routine task to investigate the question, "How can you get as close as possible to the target product?"

Assess and Respond



A Pre-Unit Check

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

TEKS 4.4.D

Sub-Unit 1

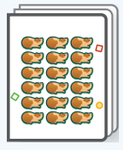


1 Explore: Estimation Station

How can you get as close as possible to a target product?

Use estimation strategies to reason about factors that result in a product close to a target number.

TEKS Building Toward: 5.3.A
TEKS 5.1.A, 5.1.B, 5.1.E, 5.1.G



2 Answering Andrea's Questions

Estimating and Determining Products of Multi-Digit Numbers

Determine products and use estimation to check for reasonableness.

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

Assess and Respond



A Quiz: Sub-Unit 1

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

TEKS 5.3.A, 5.3.B, 4.4.F

Sub-Unit 2



6 Whose Quotient Is It Anyway?

Dividing Multi-Digit Dividends by One-Digit Divisors

Use familiar strategies, including estimation, to divide multi-digit dividends by one-digit divisors.

TEKS Building Toward: 5.3.C
TEKS 5.1.A, 5.1.C, 5.1.D



7 What Do You Think?

Dividing Three- and Four-Digit Dividends by Two-Digit Divisors

Use partial quotients strategies and estimation to divide three- and four-digit dividends by two-digit divisors resulting in two-digit quotients and no remainders.

TEKS 5.3.A, 5.3.C
TEKS 5.1.B, 5.1.E

Assess and Respond

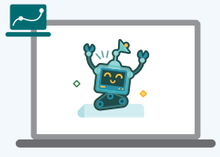


A Quiz: Sub-Unit 2

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

TEKS 5.3.A, 5.3.C

Sub-Unit 3



11 It's All in the Details

Representing Multi-Step Story Problems With Equations Using a Letter Standing for the Unknown Quantity

Analyze information in story problems to identify and write equations with a letter standing for the unknown.

TEKS 5.4.B
TEKS 5.1.A, 5.1.B, 5.1.C, 5.1.D, 5.1.E



12 Uncovering the Unknown

Solving Multi-Step Story Problems With Equations Using a Letter Standing for the Unknown Quantity

Represent and solve multi-step story problems using equations involving an unknown quantity.

TEKS 5.4.B, 5.4.F
TEKS 5.1.A, 5.1.B, 5.1.E, 5.1.F, 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: 22 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



3 Miles of Fun

Representing Values of Expressions Involving Multi-Digit Factors

Use partial products strategies to multiply multi-digit whole numbers.

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



4 Partial Products Everywhere

Determining Products Using a Partial Products Algorithm

Use a partial products algorithm to multiply multi-digit whole numbers.

TEKS Building Toward: 5.3.B
TEKS 5.1.B, 5.1.E

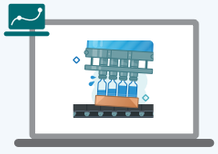


5 Multiplication Mayhem

Multi-Digit Multiplication Fluency

Use estimation strategies and place value understanding to multiply multi-digit whole numbers using the standard algorithm.

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



8 Emptying the Water Tank

Determining 1 Partial Quotient for Each Place Value

Use partial quotients strategies to divide up to four-digit dividends by two-digit divisors resulting in two- or three-digit quotients and no remainders.

TEKS 5.3.C
TEKS 5.1.E, 5.1.F

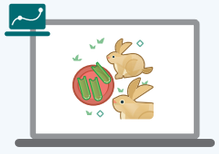


9 Algorithm Affinity

Dividing Multi-Digit Dividends by Two-Digit Divisors Using the Standard Algorithm

Use partial quotients strategies to divide up to four-digit dividends by two-digit divisors resulting in three-digit quotients with and without remainders.

TEKS 5.3.C, 5.4.H
TEKS 5.1.C, 5.1.D, 5.1.E, 5.1.F, 5.1.G



10 Celery Chop

Representing Remainders

Solve division story problems and represent quotients as mixed numbers.

TEKS 5.3.C
TEKS 5.1.G

Assess and Respond

Sub-Unit 4



13 Game, Set, Match!

Using Reasoning, Without Evaluating, to Compare Expressions

Interpret and compare numerical and written equations, without evaluating them, using properties of operations.

TEKS Building Toward: 5.4.F
TEKS 5.1.D, 5.1.F, 5.1.G



A Quiz: Sub-Unit 3

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

TEKS 5.4.B, 5.4.F



14 Money, Money, Money!

Types of Income and Taxes

Identify different tax types and differentiate between gross and net income.

TEKS 5.10.A, 5.10.B
TEKS 5.1.A, 5.1.D

Unit at a Glance

Explore

Estimation Station: Launch the unit with a non-routine task to investigate the question, "How can you get as close as possible to the target product?"

continued



15 Is It Balanced?

Making and Balancing a Budget

Determine when expenses exceed income in a budget, and describe actions to balance a budget.

TEKS 5.3.K, 5.10.E, 5.10.F
TEKS 5.1.A



16 Add It, Subtract It, Track It!

Creating Strategies to Keep Financial Records

Develop and use a system for keeping financial records to track income, savings, and spending.

TEKS 5.3.K, 5.10.D
TEKS 5.1.A, 5.1.E



17 Time to Check Out!

Analyzing Payment Methods

Analyze and compare different methods of payment.

TEKS 5.3.B, 5.10.C
TEKS 5.1.A, 5.1.F, 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: 22 days | **Short on time?** See pacing considerations below.

Pre-Unit Check: 20 min

Sub-Unit Quizzes: 20 min each

17 Lessons: 60 min each

End-of-Unit Assessment: 45 min

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 5.3.A, 5.3.B, 5.3.C, 5.10.A, 5.10.B, 5.10.C, 5.10.E, 5.10.F

TEKS 5.1.A, 5.1.C, 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 3: This lesson can be omitted if students are able to multiply multi-digit numbers using expressions to represent partial products.

Lessons 7–8: These lessons can be condensed into 1 lesson if students are able to solve for quotients of up to a four-digit dividend by a two-digit divisor without remainders using area models fluently.

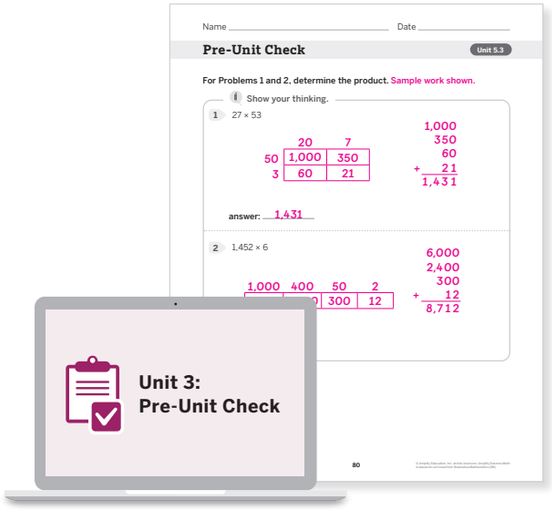
Assessments

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.

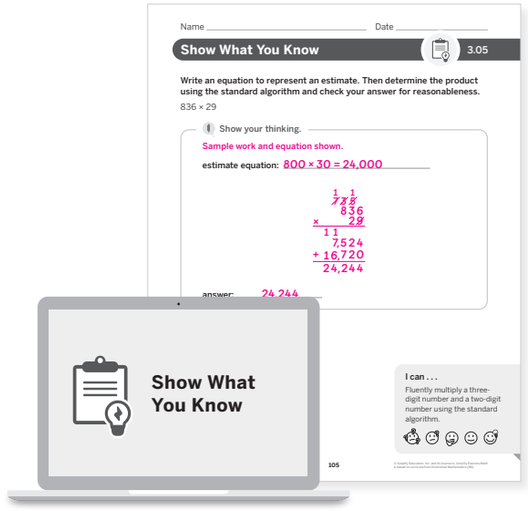
TEKS: 4.4.D



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. **(Lesson 5)**

TEKS: 5.1.E, 5.1.G, 5.3.A, 5.3.B

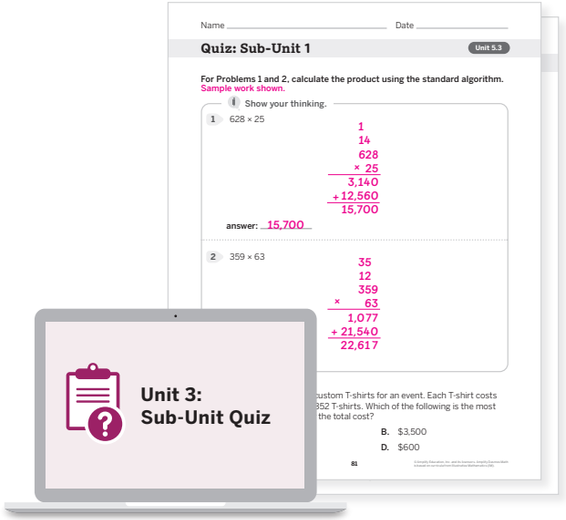


Sub-Unit Quizzes

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

TEKS assessed on:

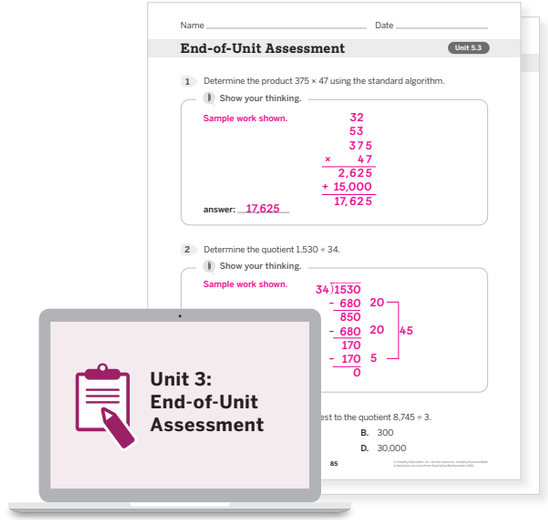
- **Quiz: Sub-Unit 1:** 5.3.A, 5.3.B
- **Quiz: Sub-Unit 2:** 5.3.A, 5.3.B
- **Quiz: Sub-Unit 3:** 5.4.B, 5.4.F



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.C, 5.1.G, 5.3.A, 5.3.B, 5.3.C, 5.4.H, 5.10.A, 5.10.B, 5.10.C, 5.10.E, 5.10.F



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**

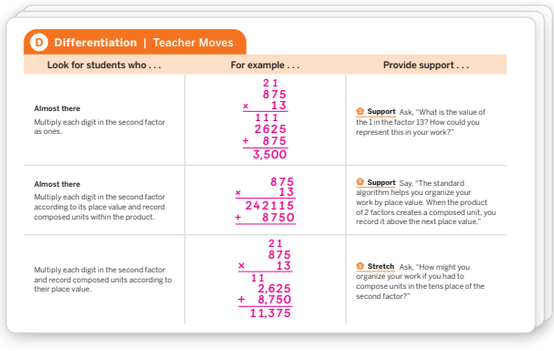
Differentiation Across the Unit

	Support Mini-Lessons	Strengthen Centers	Stretch Extensions
Sub-Unit 1 (Lessons 2–5)	• **ML 3.02:** Estimating and Finding Products of Multi-Digit Numbers • **ML 3.03:** Representing Multiplication With Area Diagrams • **ML 3.04:** Finding Products Using a Partial Products Algorithm • **ML 3.05:** Multi-Digit Multiplication Fluency	• ***Cover Up:*** *Two-digit Factors* • ***Equation Challenge:*** *Two-digit Factors, Multi-digit Factors*	• **Sub-Unit 1 Extension Activities**
Sub-Unit 2 (Lessons 6–10)	• **ML 3.06:** Dividing Multi-Digit Dividends by One-Digit Divisors Without Remainders • **ML 3.07:** Dividing Three-Digit Dividends by Two-Digit Divisors Without Remainders • **ML 3.08:** Using Partial Quotients To Divide By Place • **ML 3.09:** Dividing Four-Digit Dividends by Two-Digit Divisors Without Remainders • **ML 3.10:** Solving Division Story Problems and Interpreting Answers	• ***Compare:*** *Multi-digit Operations* • ***Equation Challenge:*** *Multi-digit Factors* • ***Watch Your Remainder:*** *One-digit Divisors, Two-digit Divisors*	• **Sub-Unit 2 Extension Activities**
Sub-Unit 3 (Lessons 11–13)	• **ML 3.11:** Selecting Equations With Parentheses to Represent Multi-Step Story Problems • **ML 3.12:** Solving Multi-Step Story Problems • **ML 3.13:** Interpreting and Comparing Written and Numerical Expressions	• ***Equation Challenge:*** *Multi-digit Factors* • ***Watch Your Remainder:*** *One-digit Divisors, Two-digit Divisors*	• **Sub-Unit 3 Extension Activities**
Sub-Unit 4 (Lessons 14–17)	• **ML 3.14:** Identifying Types of Income and Taxes • **ML 3.15:** Balancing a Budget • **ML 3.16:** Creating Strategies to Keep Financial Records • **ML 3.17:** Analyzing Payment Methods	• ***Equation Challenge:*** *Add and Subtract Beyond 1000, Multi-digit Factors*	• **Sub-Unit 4 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 5**, where students solved three-digit by two-digit multiplication expressions using the standard algorithm.



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
gross income	14
income tax	
net income	
payroll tax	
property tax	
sales tax	
balanced budget	15
budget	
financial record	16
check	17
credit card	
debit card	
electronic payment	

Review Vocabulary
algorithm
brackets
deposit
difference
dividend
divisor
estimate
expenses
expression
factor
income
interest
mixed number
order of operations
parentheses
partial product
partial quotient
product
quotient
regroup
remainder
sum
withdraw

Contextual Vocabulary	Lesson
advantages	17
disadvantages	

Spotlight on Vocabulary

Vocabulary Strategy

In this unit, the term **net income** is defined as the amount of money left after deducting taxes from gross income. Consider using the following vocabulary routine to support students' vocabulary development. **ELPS 3.E**

Word Connections: Prior Knowledge Invite students to fold a piece of paper in two equal horizontal sections. Ask:

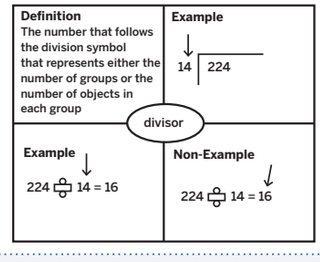
- "What 2 individual words do you see in this term? Write each word in each section on your paper."
- "What do you think of when you see the term *net*? Draw or write an example in the top section."
- "What do you know about the term *income*? Draw or write an example in the bottom section."
- Ask, "How does the meaning of *net* and *income* help you understand how **net income** is determined?"

net
I think of a fishing net. The fish stay in the net, and water gets through the holes.

income
Income is the money you make from your job

Frayer Models

Lesson 6 Invite students to create a Frayer Model graphic organizer that shows the definition, example, and non-examples of the term *divisor*.





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(s)
MLR1: Stronger and Clearer Each Time	13, 14
MLR2: Collect and Display	11
MLR6: Three Reads	7
MLR7: Compare and Connect	2, 3, 9, 12
MLR8: Discussion Supports	5, 15, 16, 17

Spotlight on MLR7: Compare and Connect

In **Lesson 9, Activity 1,** students compare and connect different multiplication strategies used and how they see place value in each of them. **ELPS 1.B, 1.E, 2.B, 2.D, 2.E**

MLR

MLR7: Compare and Connect

Use the Think-Pair-Share routine. Ask:

- "How is the standard algorithm similar to the partial quotients strategy?"
- "How are the strategies different?"

Spotlight on Meaningful Language Interactions

Listening

In **Lesson 3, Activity 1**, students use partial products strategies to solve expressions and real-world problems involving multi-digit factors.

EB **Emergent Bilinguals** Students may be unfamiliar with the term partial products. Consider naming what a partial products strategy is so it is clear how students will be solving. **ELPS 1.B**

Speaking

In **Lesson 15, Activity 2**, students describe actions to take when balancing a budget.

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together as they complete this activity. **ELPS 1.E, 2.C, 2.D**

Reading

In **Lesson 7, Activity 1**, students read and interpret a real-world problem before solving using a partial quotient strategy.

EB **Emergent Bilinguals** As students discuss similarities and differences, provide them with sentence frames to support their discussion. For example, "Our partial quotients are similar in that we both . . ." and "Our partial quotients are different because we . . ., while you . . ." **ELPS 1.E, 2.C, 2.E**

Writing

In **Lesson 13, Activity 2**, students use a combination of high-frequency words and vocabulary terms to explain how they determined whether equations were greater than, less than, or equal to each other.

EB **Emergent Bilinguals** Encourage students to annotate the numerical equations with words and phrases. For example, write "groups of" above multiplication operations, and sum above addition operations. Consider demonstrating these annotations as needed. **ELPS 4.C**

Materials and Prep

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

Materials

Manipulative Kit

- base-10 blocks (as needed) **(Lesson 6)**
- number cubes **(Lesson 16)**

Classroom materials

- chart paper **(Lessons 1, 11, 13–14)**
- markers **(Lessons 1, 11, 13–14)**
- paper **(Lesson 15)**

Additional Printable Resources

Lesson

- Activity PDFs* **(Lessons 1, 5, 11, 13–17)**
  *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

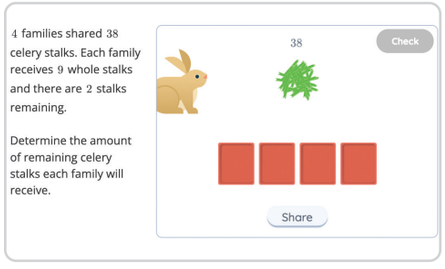
Caregiver Letter

Centers

Technology

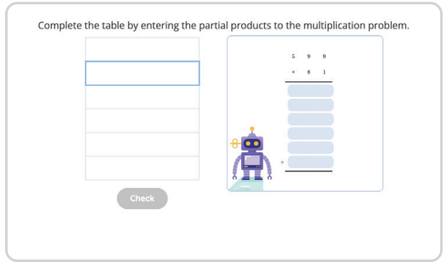
Dynamic, digital interactions are integral to Amplify Desmos Math. Powerful digital tools, such as the Teacher Dashboard, enable teachers to effectively facilitate rich math discussions.

A Powerful Digital Experience



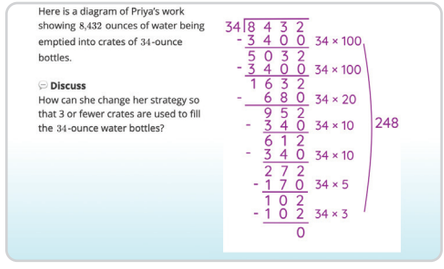
Visualize the Mathematics
(Lesson 10)

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



Receive Responsive Feedback
(Lesson 4)

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 8)

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?
4 Partial Products Everywhere	Students complete multiplication expressions that display the partial products of each factor and receive Responsive Feedback in real time.
8 Emptying the Water Tank	Students can engage in multiple trials to support their understanding of using a partial quotients strategy.
10 Celery Chop	Students divide remainders based on the size of the divisor to represent quotients as mixed numbers, and revise their thinking as they go.

Accessibility

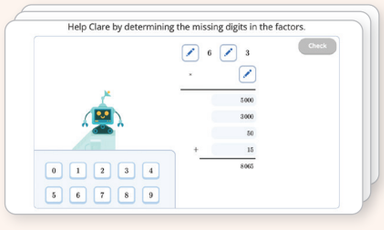
Every lesson is designed using the principles of Universal Design for Learning. Every lesson also includes support suggestions that build on students' strengths.

Universal Design for Learning

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

Spotlight on Building Knowledge. . .

Lesson 4, Activity 2: Students use interactive models and visuals to explore mathematical patterns, making sense of partial products.

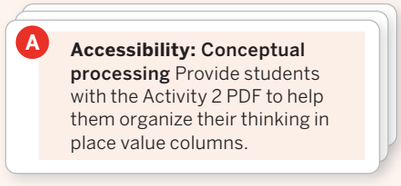


Just-In-Time Accommodations and Supports

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

Spotlight on Conceptual Processing. . .

Lesson 14, Activity 2: This Accessibility support is provided during the Connect to support students as they describe the effect of taxes on gross and net income.



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.

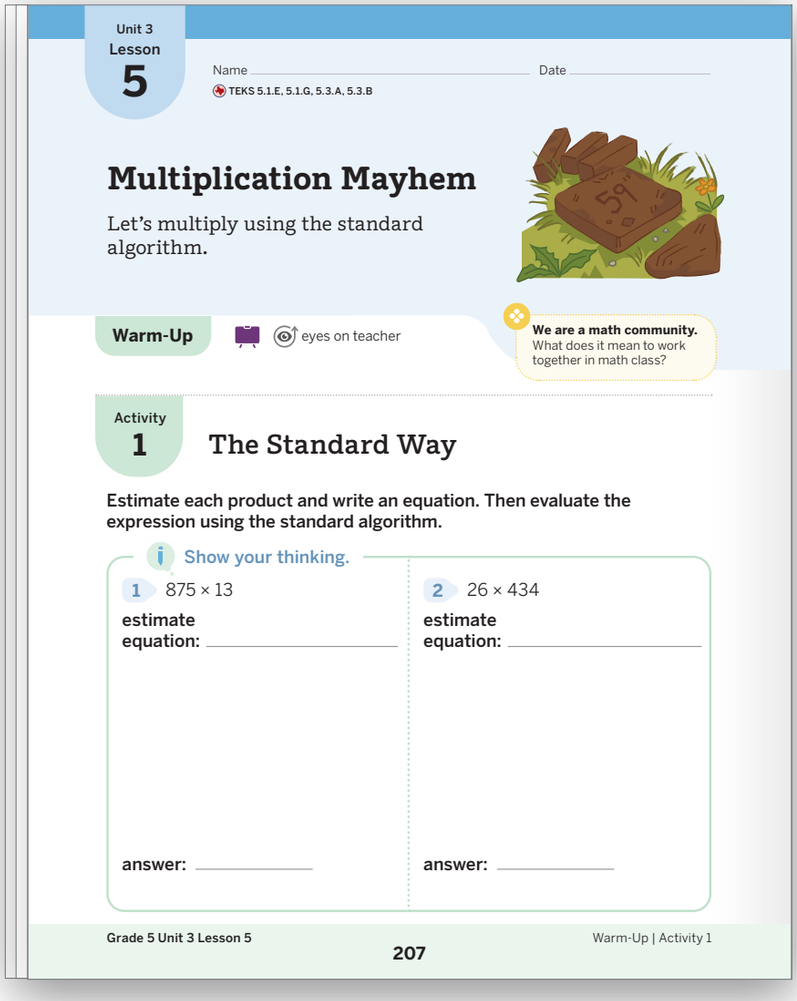
		Introduced in Activity in	Suggested for Differentiation in	TEKS
Compare	Multi-Digit Operations	Grade 4	Lessons 6–10	4.4.F, 4.4.D
Cover Up	Two-digit Factors	Grade 4	Lessons 2–4	4.4.D
Equation Challenge	Add and Subtract Beyond 1000	Grade 4	Lessons 14–16	4.4.A
	Multi-digit Factors	Grade 5	Lessons 6–13, 17	5.3.B
Watch Your Remainder	One-digit Divisors	Grade 4	Lessons 10–12	4.4.F
	Two-digit Divisors	Grade 5	Lessons 10–13	5.3.C

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 5, Activity 1



Unit 3
Lesson
5

Name _____ Date _____

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

Multiplication Mayhem

Let's multiply using the standard algorithm.

Warm-Up eyes on teacher

We are a math community. What does it mean to work together in math class?

Activity
1

The Standard Way

Estimate each product and write an equation. Then evaluate the expression using the standard algorithm.

Show your thinking.

1 875 × 13

estimate

equation: _____

answer: _____

2 26 × 434

estimate

equation: _____

answer: _____

Grade 5 Unit 3 Lesson 5 207 Warm-Up | Activity 1

Try This

Put on your student hat and complete Problems 4 and 5.

Questions for reflection

- This is the first time students are asked to evaluate three-digit by two-digit multiplication expressions using the standard algorithm.
  - » What do students need to understand about place value when using the standard algorithm?
- Some students may use one-digit multiplication when multiplying digits in both places of the second factor.
  - » How might you support your students in reasoning about each value using place value?

Other lessons that attend to reasoning:

- **Lesson 7:** Students estimate to reason about the size of the quotient of a three-digit or four-digit dividend and two-digit divisor before solving using the standard algorithm.
- **Lesson 11:** Students use their understanding of the 4 operations to reason about which numerical equation represents a real-world problem without solving.
- **Lesson 14:** Students reason about the type of tax applied in real-world scenarios involving financial literacy.

Mathematical Background

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

Multi-Digit Multiplication and Division and Financial Literacy

Multiplying multi-digit whole numbers

TEKS 5.3.A, 5.3.B

- Multi-digit multiplication can be performed by using:
  - » Area models: a calculation that uses decomposed factors by place value.
  - » Partial products: a method of performing multiplication by place value, written vertically.
  - » Standard algorithm: a condensed way to multiply by each place value

Area Model

	800	70	5	
30	24,000	2,100	150	26,250
4	3,200	280	20	+ 3,500
				29,750

Partial Products

$$\begin{array}{rr} 875 & \\ \times\ \ 34 & \\ \hline 120 & 4 \times 5 \\ 280 & 4 \times 70 \\ 3,280 & 4 \times 800 \\ 150 & 30 \times 5 \\ 2,100 & 30 \times 70 \\ +\ 24,100 & 30 \times 800 \\ \hline 29,750 & \end{array}$$

Standard Algorithm

$$\begin{array}{r} {\scriptstyle 2\ 1} \\ {\scriptstyle 3\ 2} \\ 875 \\ \times\ \ 34 \\ \hline 3,500 \\ +\ 26,250 \\ \hline 29,750 \end{array}$$

Dividing multi-digit whole numbers by two-digit divisors

TEKS 5.3.C

- Area models connect multiplication to division.
  - » By multiplying and subtracting the total from the dividend, the quotient can be calculated using familiar numbers.
- Partial quotient strategies help logically estimate division answers and introduce the standard algorithm.
  - » Multiplication facts can be repeated to subtract away from the total dividend.

Area Model

1,008 ÷ 21

	40	5	3
21	840	105	63

$$\begin{array}{rr} 21 \times 40 = & 840 \\ 21 \times 5 = & 105 \\ +\ 21 \times 3 = & 63 \\ \hline 21 \times 48 = 1{,}008 & \end{array}$$

Partial Quotient

$$\begin{array}{rr} 1{,}008 \div 21 & \\ 21\overline{)1008} & \\ -\ 840 & 40 \\ \hline 168 & \\ -\ 105 & 5 \\ \hline 63 & \\ -\ 63 & 3 \\ \hline 0 & \end{array}$$

40 + 5 + 3 = 48

1,000 + 21 = 48

Using parentheses in numerical expressions and equations

TEKS 5.4.B

- Parentheses are grouping symbols that can be used in expressions and equations to indicate what is evaluated first.
- Expressions can be compared without being evaluated by interrupting the grouping symbols and operations.

$3 \times (15 - 8) > 3 \times (12 - 3)$

- Both expressions show 3 times an amount.
- 12 – 3 is greater than 15 – 8.
- So, the value of $3 \times (12 - 3)$ is greater.

Developing systems for managing financial resources

TEKS 5.10.D, 5.10.E

- Developing a system for keeping and using **financial records** helps lead to responsible financial decisions.
  - » If financial records show that *expenses* are exceeding *income*, actions can be taken to create a **balanced budget**.

Keeping a record can be beneficial in making financial decisions so that you can see where you are spending money, how much money you are making, and how much you have left to spend.

Connections to Future Learning

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

Multiplying With Decimals

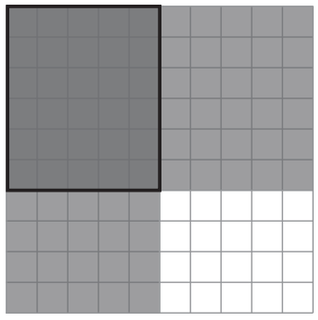
In this unit, students used area models and the standard algorithm to multiply multi-digit numbers. **In Unit 4,** students will extend their work with whole number, multi-digit multiplication to represent multiplication of decimals with products to the hundredths using pictorial models and strategies based on place-value understanding.

TEKS: 5.3.D, 5.3.E

Example:

0.5 × 0.60 = 0.30

I determined the product by looking at the darkest part of the model, where the factors overlap. I circled the darker part to show 5 tenths of 60 hundredths.



Dividing With Decimals

In this unit, students used the standard algorithm to divide up to four-digit dividends by two-digit divisors. **In Unit 4,** students will extend their work with the standard algorithm to divide decimals up to the hundredths by whole numbers. They represent and solve for quotients of decimals to the hundredths, including up to four-digit dividends and two-digit whole number divisors.

TEKS: 5.3.A, 5.3.F, 5.3.G

Example:

841.4 ÷ 2

$$
\begin{array}{r}
420.7 \\
21\overline{)841.4} \\
-8 \\
\hline
04 \\
-\ 4 \\
\hline
014 \\
-\ 14 \\
\hline
0
\end{array}
$$

Distinguishing Between Payment Methods

In this unit, students identified the advantages and disadvantages of different payment methods, including credit cards, debit cards, checks, and electronic payments. **In Grade 6,** students will distinguish between the similarities and differences between debit cards and credit cards.

TEKS: 6.14.B

Example:

Diego wants to buy a new bike, but he does not have enough money in his bank account to pay for one. Diego wants to use his debit card to make the purchase. What should Diego do?

Diego should not use his debit card to buy the bike. When you buy items with your debit card, the money is withdrawn from your bank account. Because he does not have enough money, he can make the purchase with a credit card, and pay it when he pays off his credit card.

Unit Story

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



About the Story

The world of practical-minded Gil is disrupted when his cousin Andrea moves into his neighborhood. He gets bewildered when she asks strange and bizarre questions in front of his friends and classmates as he shows her around. Then, during a walk home from school, the two find a duckling in distress. To rescue it, Gil needs to employ the same kind of thinking that Andrea excels at. Working together, they devise a plan that allows them to rescue the duckling.

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

Multi-Digit Multiplication and Division and Financial Literacy

As Gil spends more time with Andrea and her way of thinking, the story provides opportunities for students to multiply and divide large numbers using multiplication and division strategies, such as the standard algorithm for multiplication and partial quotients strategies.

Throughout the unit . . .

- Students use their understanding of multiplication and division to answer questions about school and the world around them.
- Students use algorithms to evaluate multiplication expressions with up to four-digit factors by two-digit factors and division expressions with up to four-digit dividends and two-digit divisors.
- Students use their understanding of personal financial literacy to manage financial resources.

Math Connections

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

- **Lesson 1, Activity 1**
- **Lesson 2, Activities 1 and 2**
- **Lesson 3, Activity 1**
- **Lesson 6, Activity 1**
- **Lesson 7, Activity 1**
- **Lesson 9, Activity 1**
- **Lesson 11, Activity 1**
- **Lesson 12, Activity 1**
- **Lesson 15, Activity 1 and 2**
- **Lesson 16, Activity 2**
- **Lesson 17, Activity 1**

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.

We are a math community.



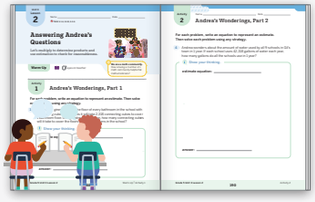
How is being a member of a math community helpful for mathematicians? **(Lesson 2)**



How can you help someone in math class today? **(Lesson 9)**

Story Moments



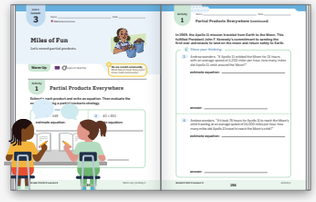


Lesson 2 Activities 1 and 2

Math Connection

Students use familiar multiplication strategies to help answer what Andrea wonders about as she tours the school.



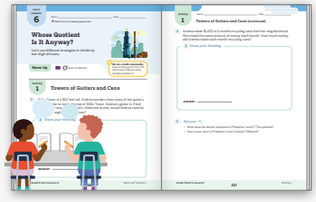


Lesson 3 Activity 1

Math Connection

Students choose a partial products strategy to use to help Andrea as she wonders about the number of materials that can be found in each bucket in the art room.

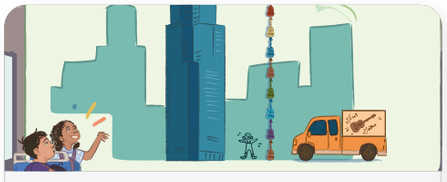


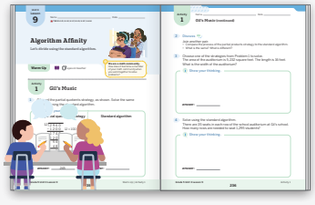


Lesson 6 Activity 1

Math Community Connection

Students use the standard algorithm to help Andrea as she wonders about making a new walkway from the school to the community garden.



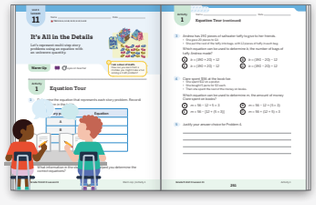


Lesson 9 Activity 1

Math Connection

Students use Gil's partial quotients strategy to solve the same problem using the standard algorithm, and compare the standard algorithm to Gil's partial quotients strategy.



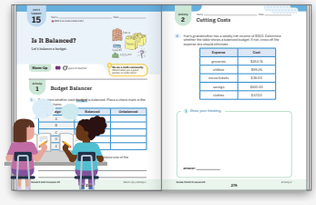


Lesson 11 Activity 1

Math Connection

Students identify which equation with a letter standing for the unknown will help Andrea determine the number of bags of taffy she can make.





Lesson 15 Activities 1 and 2

Math Connection

Students help Gil and Andrea's family members balance a budget by eliminating expenses.

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

Read-Aloud Andrea

2



I'm Gil and my cousin Andrea has a unique way of thinking about things. Sometimes it's like she's off in her own little world.

3



She'd just moved here from Chicago. On the first day of school, I invited her to sit with me and my friends during lunch.

My friend Monica had spent the whole summer at the ocean. She brought back a box of saltwater taffy to share with us.

4



Andrea took a piece and started chewing it. Then, she took a wad out of her mouth and pulled it with her fingers. "Pretty stretchy," she said.

I was horrified. "What are you doing?"

But Andrea was too absorbed with her own thoughts to hear me. "You ever wonder how far a piece of taffy can stretch?"

5



"Like how much taffy do you think you'd need to cover the entire school?" she wondered.

Monica stared at her, unsure of what to say. But Andrea didn't seem to notice. She just kept looking at the taffy.

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

6



After school we took the bus home. On the bus I like to relax and listen to music. I was drifting away when suddenly I felt a tap on my shoulder.

It was Andrea.

7

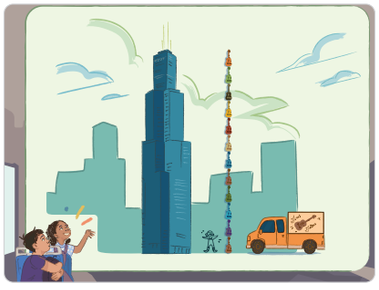


"What are you listening to, Gil?"

I handed her my headphones.

"Not bad," she said. "Hey, what if we started a band and made up new instruments?"

8



"Like a trombone made of bones or a drum with pudding inside so that every time you hit it, it would go splat! Or a bunch of guitars, one on top of the other so that the long part—"

I could barely keep up with her. "The neck?"

Andrea nodded. "Yeah, the neck. What if the neck were super tall? Like Willis Tower tall."

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

9



I sighed. Covering the school in taffy! Stacking up guitars to the size of a skyscraper! Who thinks like that?

I signaled for the bus to stop. "Come on," I told her. "Let's walk the rest of the way."

10



I hoped a walk through the park would clear my head. As we passed by the fountain, we suddenly heard a noise.

11



There was a duck standing by a grate, flapping her wings in a panic. At the bottom of the grate I saw a duckling. It was trapped down there!

I got on my knees and tried to get it out. "I can't reach," I said.

12



I looked around for help, but there was no one else there. I didn't know what to do!

But Andrea was calm. "Come with me," she said. She went to the trash can nearby. She pulled out an old drink cup and gave it to me. Then she found a used soup container.

13



It wasn't until she started filling the containers with water from the fountain that I understood what she was planning.

Together we poured the water into the grate. It was genius! If the water level rose, we'd be able to just reach in and pick up the duckling!

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

14



We kept making trips back and forth to the fountain. Soon, others saw us and started helping. They grabbed whatever they could to fill with water—buckets, bowls, cans, even an old boot!

Eventually, the water rose high enough for me to stick my hand through the grate and let the duckling hop onto my cup.

The mother quacked happily. As the two of them scurried off, I realized that we had all pitched in, but it was Andrea who saved the day. Andrea, with her unique way of thinking.

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	Multiplying 2 two-digit numbers	Lesson 2	1	4.4.D *(S)*
2	Multiplying four-digit numbers by one-digit numbers	Lesson 2	2	4.4.D *(S)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





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

Centers Resources includes:
- Centers

PDF *Assessment Resource PDF*

Name _____ Date _____

Pre-Unit Check

Unit 5.3

For Problems 1 and 2, determine the product. Sample work shown.

Show your thinking.

1 27 × 53

	20	7
50	1,000	350
3	60	21

1,000
350
60
+ 21
1,431

answer: 1,431

2 1,452 × 6

	1,000	400	50	2
6	6,000	2,400	300	12

6,000
2,400
300
+ 12
8,712

answer: 8,712

80

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Digital

Unit 3
Pre-Unit Check

D Differentiation (Pre-Unit Check)

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

Sub-Unit Goal	Problem	Respond to Student Thinking
Preparation for Sub-Unit 1: Multiply multi-digit whole numbers using the standard algorithm.	1	**Support** • **Center:** *Cover Up, Two-Digit Factors* • **Teacher Move:** Plan to support students in Lesson 4 as they determine products using a partial products algorithm.
	2	**Support** • **Mini-Lesson:** *Multiplying Three-Digit and Four-Digit Numbers by One-Digit Number* (Grade 4 ML 5.03)

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:

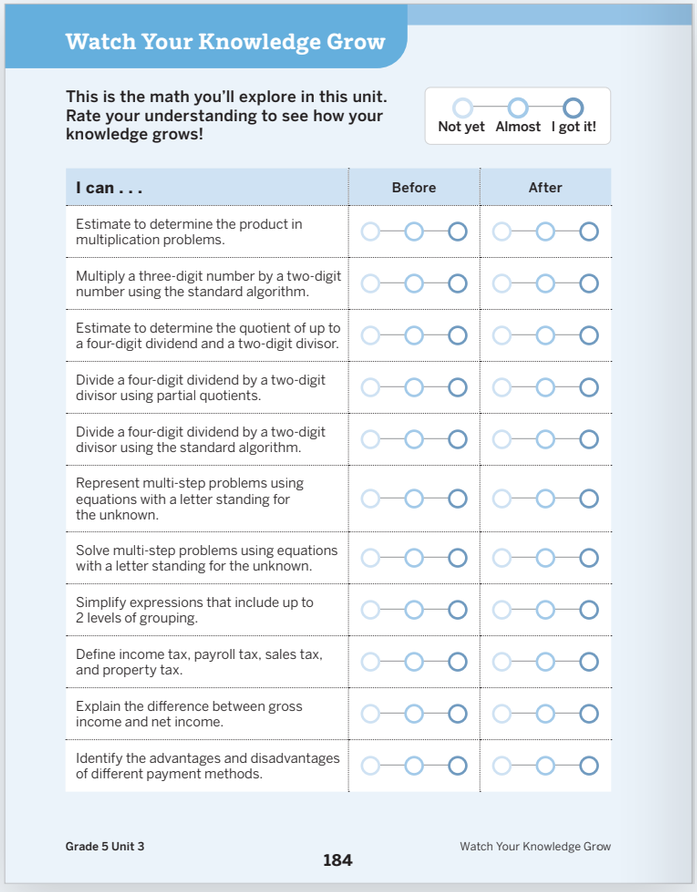
- "How have you multiplied multi-digit numbers before? Divided?"
- "Have you used area models to multiply or divide before? How do you think it might be helpful?"

EB **Emergent Bilinguals** Consider providing a list with fewer, shorter, and simpler "I can . . ." statements. For example, consider providing the following list for this unit.

- I can represent the values of digits in decimals.
- I can compare and order decimals.
- I can round decimals.
- I can add and subtract decimals.
- I can multiply decimals and whole numbers.
- I can multiply decimals and decimals.
- I can divide decimals by whole numbers.

ELPS 4.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!

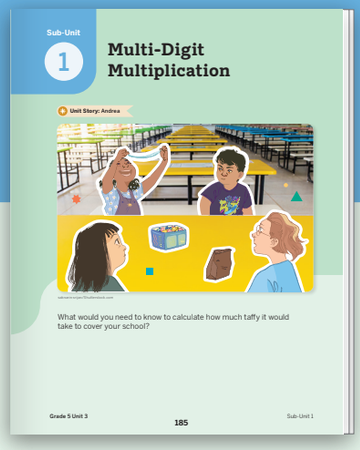
Not yet Almost I got it!

I can . . .	Before	After
Estimate to determine the product in multiplication problems.		
Multiply a three-digit number by a two-digit number using the standard algorithm.		
Estimate to determine the quotient of up to a four-digit dividend and a two-digit divisor.		
Divide a four-digit dividend by a two-digit divisor using partial quotients.		
Divide a four-digit dividend by a two-digit divisor using the standard algorithm.		
Represent multi-step problems using equations with a letter standing for the unknown.		
Solve multi-step problems using equations with a letter standing for the unknown.		
Simplify expressions that include up to 2 levels of grouping.		
Define income tax, payroll tax, sales tax, and property tax.		
Explain the difference between gross income and net income.		
Identify the advantages and disadvantages of different payment methods.		

Grade 5 Unit 3 184 Watch Your Knowledge Grow

Sub-Unit 1

Multi-Digit Multiplication



Sub-Unit 1 Goal:

- Multiply multi-digit whole numbers using estimation and the standard algorithm.

Progression of TEKS in Sub-Unit 1

- **Lessons 1–3:** Students estimate to determine a reasonable product before using partial products strategies to multiply three-digit numbers by two-digit numbers. They decompose factors by place value in area models to determine the products of multi-digit numbers.
- **Lessons 4–5:** Students estimate to determine a reasonable product before using the standard algorithm to multiply three-digit numbers by two-digit numbers.

Sub-Unit 1 Progression	Lesson 1*	Lesson 2	Lesson 3	Lesson 4*	Lesson 5
Number and operations					
TEKS 5.3.A	●	●	●	○	●
TEKS 5.3.B	●	○	○	●	●

*This lesson builds toward the standard shown.

Coming up Next

- **Sub-Unit 2, Lessons 6–10:**
  - » Number and operations: TEKS 5.3.C
  - » Algebraic reasoning: TEKS 5.4.H
- **Sub-Unit 3, Lessons 11–13:**
  - » Algebraic reasoning: TEKS 5.4.B, 5.4.H
- **Sub-Unit 4, Lessons 14–17:**
  - » Number and operations: TEKS 5.3.B
  - » Personal Financial Literacy: TEKS 5.10.A, 5.10.B, 5.10.C, 5.10.D, 5.10.E, 5.10.F

Math That Matters Most

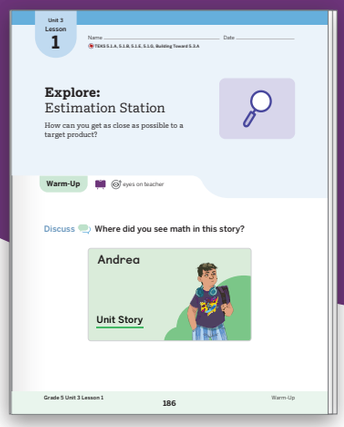
Sub-Unit 1: Use the standard algorithm to multiply multi-digit numbers.

Progression of Strategies, Skills, or Language

Progression	For example . . .
Using estimation to reason about the size of products.	16 × 349 estimate equation: 20 × 300 = 4,800 I rounded 349 to 300 and 16 to 20 because I know that 2 × 3 is 6 so 20 × 300 is 6,000. I wanted to round them to the nearest 10 and 100 to create friendly numbers. The product should be close to 6,000.
Using area models to evaluate a three-digit by two-digit multiplication expression.	3,075 × 18 3,000 × 10 = 30,000 70 × 10 = 700 5 × 10 = 50 3,000 × 8 = 24,000 70 × 8 = 560 5 × 8 = 40 30,000 24,000 700 560 50 + 40 55,350
Using partial products algorithms to evaluate a three-digit by two-digit multiplication expression.	639 × 17 600 × 17 = 10,200 30 × 17 = 510 9 × 17 = 153 10,200 + 510 + 153 = 10,863 639 × 17 63 210 4,200 90 3,000 + 6,000 10,863
Using the standard algorithm to multiply a three-digit number by two-digit number.	875 × 34 3,500 + 26,250 29,750

Unit 3
Lesson
1

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



Explore:
Estimation Station

How can you get as close as possible to a target product?

Key Concepts

Today's Goals

1. **Goal:** Use estimation strategies to reason about factors that result in a product close to a target number.
2. **Language Goal:** Justify that the value of a multiplication expression is close to a target product. **(Listening, Speaking, and Writing)** **ELPS 1.E, 2.E, 2.F, 4.D, 4.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 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 mathematical practices and invites all students to see themselves as mathematicians. **(TEKS 5.1.A)**

Students write expressions with whole number factors that result in target products in the hundreds and thousands. When given the constraints of using non-repeating digits 1–9, students must use place value reasoning and different estimation strategies to justify their thinking. This lesson provides an opportunity to hear students' mathematical language around place value and estimation, 2 concepts integral to their multiplication and division work in this unit. **(TEKS 5.1.B, 5.1.E, 5.1.G)**

In Grade 4, students used a variety of place value strategies to multiply factors up to 4 digits by 1 digit and 2 digits by 2 digits and to divide multi-digit dividends by one-digit divisors. This Explore sets the stage for the unit's work where students use the standard algorithm to multiply multi-digit numbers and use partial quotient strategies to divide up to four-digit dividends by two-digit divisors.

Caregiver Connection

At home, students can turn the activity into a game by choosing a target value, asking others for expressions, and then giving feedback on the suggested expressions. This allows students to apply their understanding of place value and estimation to analyze the thinking of others.

Vocabulary

Review Vocabulary

estimate

factor

product

TEKS

Building Toward

5.3.A

Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division.

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

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

Building On

4.4.D

4.4.G

Lesson at a Glance

60 min

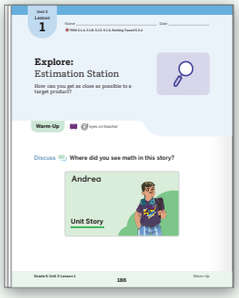
TEKS: 5.1.A, 5.1.B, 5.1.E, 5.1.G, Building Toward 5.3.A

Warm-Up

Whole Class | 15 min

Students are introduced to 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, *Andrea*

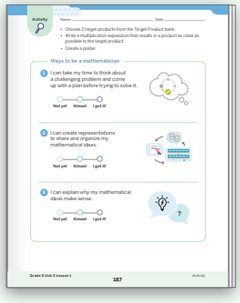


Activity

Pairs | 45 min

Students use what they know about place value and estimation strategies to write multiplication expressions that result in products close to target values. They create posters in which they justify their reasoning and conduct a **Gallery Tour** to see how others justified their reasoning.

Materials: Activity PDF, chart paper, *Explore Organizer* PDF (optional), markers



Opportunities for Extension *(Optional)*

Students can create their own target products and challenge another pair of students to write expressions.

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** 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.

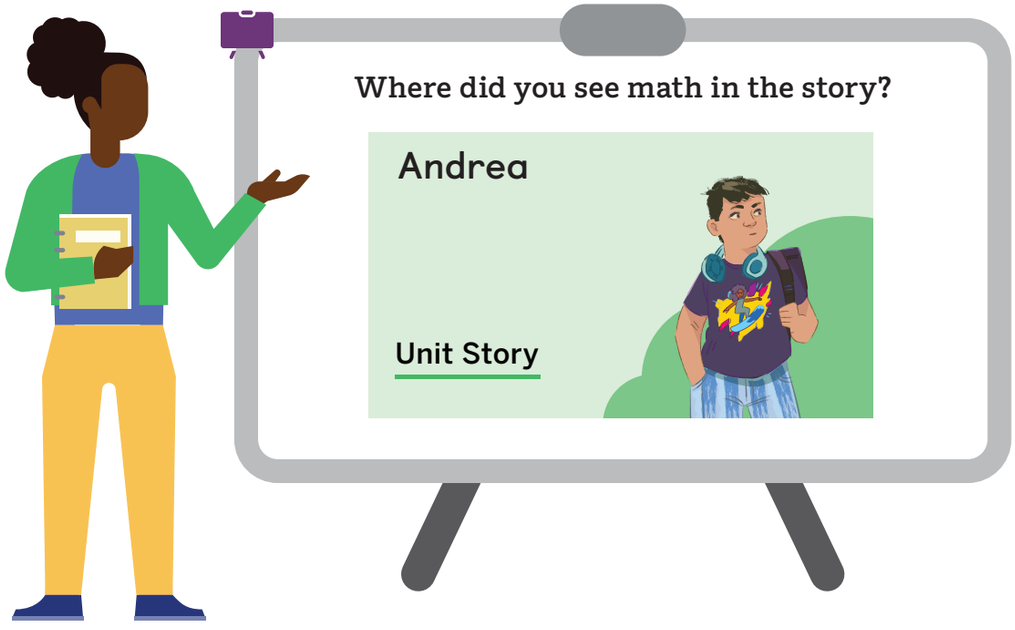
Whole Class | 15 min

Presentation Screens



Warm-Up Notice and Wonder

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



1 Launch

Display the cover of the Unit Story, *Andrea*.

Use the Think-Pair-Share routine. Activate students' background and prior experiences by asking, "Where do you see math in the world around you?"

Read aloud the Unit Story, from this Teacher Edition, while displaying the illustrations on Screens 2–14. Demonstrate reading with prosody to illustrate expression, rising and falling intonation patterns, pitch, and timing. ELPS 1.A, 1.E, 3.H

Use the Notice and Wonder routine.

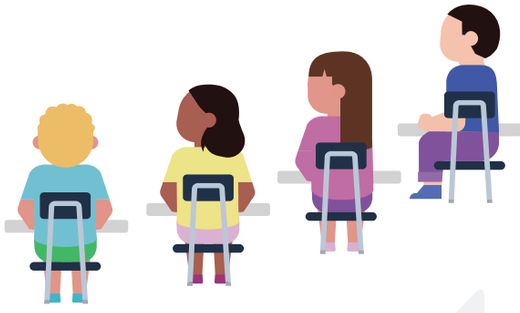
Pause on Screens 5, 8, and 13. Ask, "What do you notice? What do you wonder?"

2 Connect

Use the Think-Pair-Share routine. Ask, "Where did you see math in the story? What do you wonder about how Andrea sees math in the world?"

Record students' responses as they share.

Say, "In this unit, you are going to use your understanding of estimation, multiplication, and division to reason about silly situations with large numbers, like Andrea and Gil did. We'll see Gil and Andrea again in this unit. But before that, you are going to multiply numbers to get as close as possible to a target product."



Students might say . . . ELPS 2.B

I notice Andrea asks creative questions.

I notice the numbers Andrea would need to answer her questions are very large.

I wonder if Andrea ever answers her own questions.

I wonder how many guitars it would take to reach the top of the tower.

Pairs | 45 min

Activity How can you get as close as possible to a target product?

Purpose: Students write multiplication expressions with non-repeating digits that result in a product close to a target value. They compare different ways to justify factor choices.

Presentation Screens



Materials

Lesson Resources:

- Distribute the Activity PDF to each pair during the Launch.
- Provide students with access to the *Explore Organizer* PDF during the Connect (optional).

Classroom materials:

- Distribute chart paper and markers to each pair during the Launch.

Make It Your Own!

This activity is written using multiples of powers of 10 to allow for different estimation strategies. Consider choosing different target products or having pairs create their own target products.

1 Launch



Read aloud the directions, reiterating that students should be estimating and not determining exact products.

EB **Emergent Bilinguals** Encourage students to record what they discussed with a partner about their estimation using drawings, words, or a graphic organizer. ELPS 1.C, 1.E

A **Accessibility: Executive functioning** Vary the task demands by having students choose only 1 target product. Check for understanding by inviting students to rephrase the directions in their own words. Listen for and clarify any questions or misconceptions they have.

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, "What is the place value of your product? How could that help you choose factors to multiply?"
- Ask, "Would multiplying 2 one-digit factors get you close to the product? How do you know? What about a one-digit factor and a two-digit factor?"

3 Connect



Display students' posters around the room.

Use the Gallery Tour routine. Have students consider the similarities and differences between the justifications. Monitor to ensure students are able to respond with accuracy. ELPS 1.C

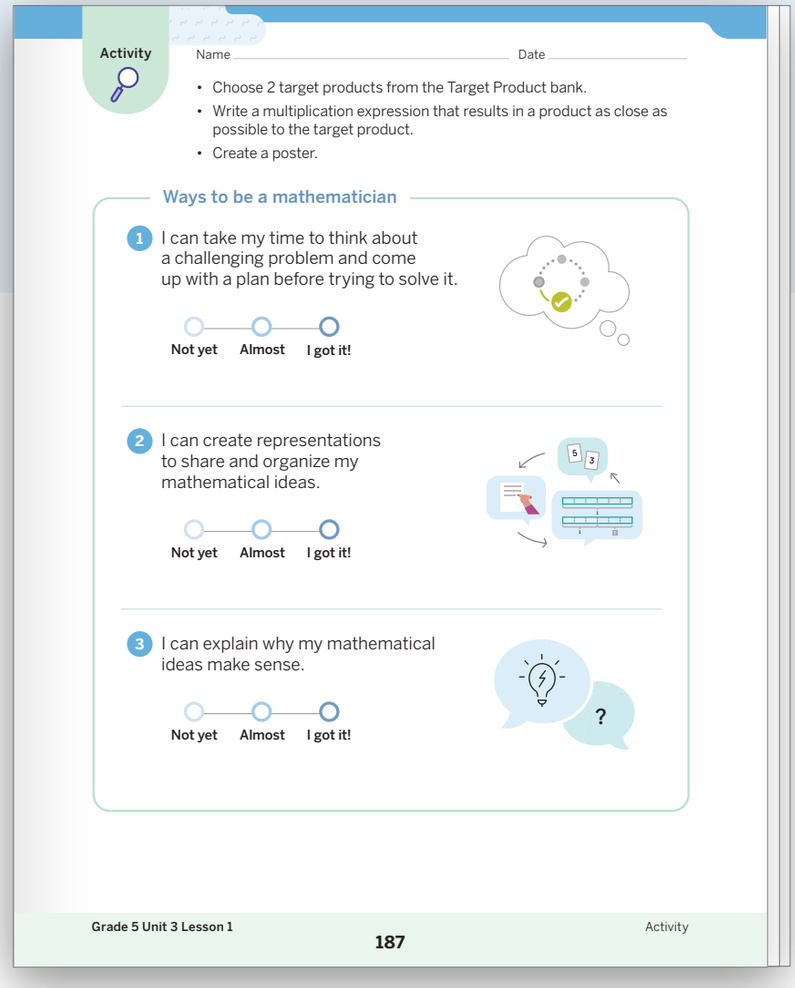
Ask:

- "What similarities did you see across the justifications?"
- "Which justifications do you have questions about? Why?"
- "Which justifications made you want to add on to or revise your own thinking? Why?"

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

Say, "Today, you used place value understanding and estimation strategies to reason about factors. Throughout this unit, you will be using place value and estimation to check for reasonableness as you multiply and divide with multi-digit numbers."

Student Edition



Activity

Name _____ Date _____

- Choose 2 target products from the Target Product bank.
- Write a multiplication expression that results in a product as close as possible to the target product.
- Create a poster.

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 create representations to share and organize my mathematical ideas.

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 3 Lesson 1 187 Activity

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . . (Target product: 1,800)	Provide support . . .
Reason about the number of digits based on the place value of the target product.	Expression: 184 × 9 *I need a three-digit and a one-digit factor if my one-digit factor rounds to 10 because 10 × 100 = 1,000, and 1,800 is in the thousands place.*	**Strengthen** Ask, "Will this strategy work for any target product? Why or why not?"
Use known multiplication facts.	Expression: 64 × 31 *I know that 6 × 3 is 18 and 10 × 10 = 100, so 60 × 30 is 1,800. So, I need to use digits in the ones place that make my factors close to 60 and 30.*	**Strengthen** Ask, "What other numbers could you have used that also round to 60? Would any of those numbers have gotten you closer to the target product? Why?"
Use known multiplication facts and rounding strategies.	Expression: 61 × 29 *I know that 6 × 3 is 18 and 10 × 10 = 100, so 60 × 30 is 1,800. I wanted to get as close as possible, and I knew I could not use 1 again, and I know 29 rounds to 30.*	**Stretch** Ask, "If your target product was 10 times as much, how would you change your factors?"

Activity Sample Student Work

Students will likely reason about factors in different ways. Because this is the beginning of the unit, there is no expectation for students to reason in a certain way.



How can you get as close as possible to a target product?

Sample student responses:

Sample response 1

Target product: 1,800

Expression: 94 × 23

Justification:

9 × 2 = 18

94 rounds to 90. 23 rounds to 20.

90 × 20 = 1,800

94 × 23 is close to 1,800.

Sample response 2

Target product: 1,800

Expression: 64 × 31

Justification: I know that 60 × 30 is 1,800 because 60 × 3 is 180 and 60 × 30 is 10 times as much. 180 × 10 is 1,800, so I can multiply 64 × 31 to get close to 1,800.

Sample response 3

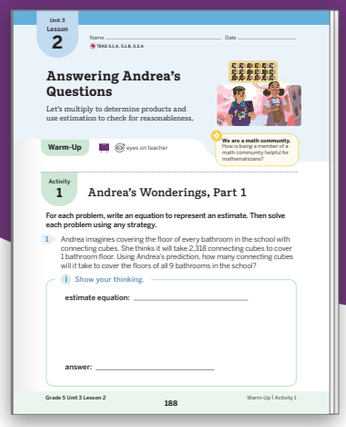
Target product: 1,800

Expression: 59 × 31

Justification: I know that 60 × 30 = 1,800, so I wanted 2 factors that are as close to 60 × 30 without repeating digits. 59 is 1 away from 60, and 31 is 1 away from 30, so the product will be very close to 1,800.

Unit 3
Lesson
2

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


Unit 3 Lesson 2

Name _____ Date _____

Answering Andrea's Questions

Let's multiply to determine products and use estimation to check for reasonableness.

Warm-Up

We are a math community. How is being a member of a math community helpful for mathematicians?

Activity 1 Andrea's Wonderings, Part 1

For each problem, write an equation to represent an estimate. Then solve each problem using any strategy.

1 Andrea imagines covering the floor of every bathroom in the school with connecting cubes. She thinks it will take 2,318 connecting cubes to cover 1 bathroom floor. Using Andrea's prediction, how many connecting cubes will it take to cover the floors of all 9 bathrooms in the school?

Show your thinking.

estimate equation: _____

answer: _____

Grade 5 Unit 3 Lesson 2 188 Warm-Up | Activity 1

Answering Andrea's Questions

Estimating and Determining Products of Multi-Digit Numbers

Let's multiply to determine products and use estimation to check for reasonableness.

Key Concepts

Today's Goals

1. **Goal:** Multiply multi-digit numbers using any strategy.
2. **Goal:** Use estimation to check for reasonableness.
3. **Language Goal:** Justify that an answer is reasonable using estimation. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students build on their multiplication and place value work from Grade 4 as they estimate and determine products for real-world multiplication problems. They consider the importance of using estimation to predict the size of products and check the reasonableness of their products. They use similar place-value based strategies to determine the products of four-digit by one-digit, five-digit by one-digit, two-digit by two-digit, and three-digit by two-digit factors. **(TEKS 5.1.A, 5.1.B)**

Prior Learning

In Grade 4, students used area models and other partial-products strategies to represent the multiplication of a four-digit factor by a one-digit factor and 2 two-digit factors.

Future Learning

In Lesson 3, students will make explicit connections to place value as they represent the partial products of an expression with or without the use of models. They will encounter real-world problems involving five-digit by one-digit, three-digit by two-digit, and four-digit by two-digit multiplication.

Integrating Rigor in Student Thinking

- Students use place value strategies and estimation to build their **conceptual understanding** of multiplication to include five-digit by one-digit and three-digit by two-digit factors.
- Students **apply** their understanding of multiplication to solve real-world problems and to multiply a five-digit number by a one-digit number and a three-digit number by a two-digit number.

Vocabulary

Review Vocabulary

partial product

product

TEKS

Addressing

5.3.A

Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, **multiplication, or division.**

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

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

Building On	Building Toward
4.4.D	5.3.B

Building Math Identity

We are a math community.
How is being a member of a math community helpful for mathematicians?

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

Lesson at a Glance

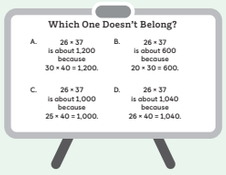
60 min

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

Warm-Up

Whole Class | 10 min

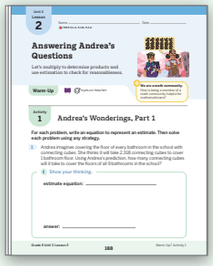
Students use the **Which One Doesn't Belong?** routine to compare different estimates to the same multiplication expression. They should be encouraged to use precise language as they give their reasons for the one they chose. **(TEKS 5.1.F, 5.1.G)**



Activity 1

Pairs | 15 min

Students estimate the product and then evaluate real-world problems with four-digit by one-digit factors and two-digit by two-digit factors. They consider what makes a product reasonable and why estimation is useful.



Activity 2

Pairs | 20 min

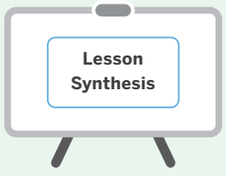
Students estimate the product and then evaluate real-world problems involving multiplication with five-digit by one-digit and three-digit by two-digit factors. They see that the same place value strategies can be used to multiply multi-digit factors.



Synthesis

Whole Class | 10 min

Students review and reflect on how place value strategies are similar and different when evaluating the product of 2 related multiplication expressions.

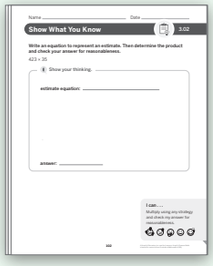


Show What You Know

Independent | 5 min

Students demonstrate their understanding by using a strategy of their choosing to estimate and determine the product of a three-digit by two-digit multiplication expression.

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
- ✓ Frayer Model
- ✓ 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.

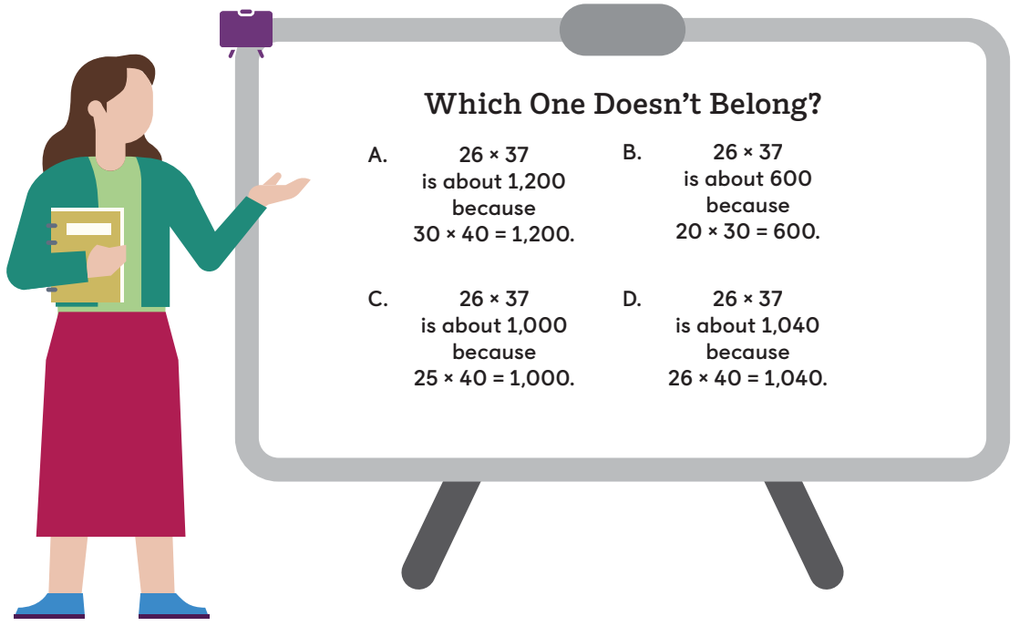
Whole Class | 10 min

Presentation Screens



Warm-Up Which One Doesn't Belong?

Purpose: Students analyze 4 estimates connected to a given multiplication expression to compare rounding strategies. They discuss reasonableness and the proximity of estimates to the actual product.

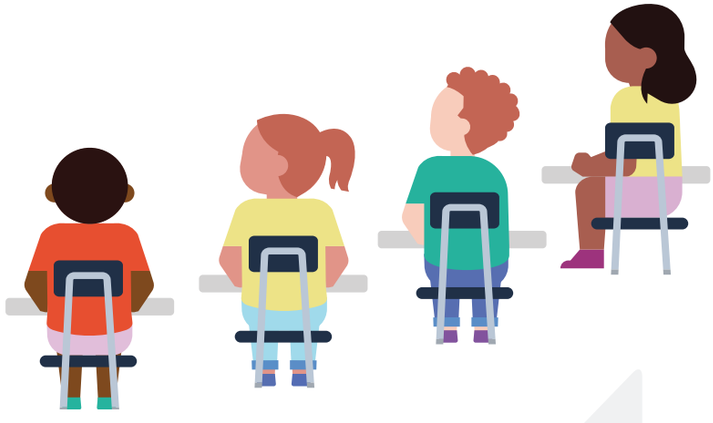


1 Launch

Display the 4 estimates.

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 the estimates similar? How are they different?"

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

A: *It is the only one that rounds both factors to the next 10 because both factors are greater than half.*

B: *It is the only one that rounds each factor to the digit that is in the front.*

C: *It is the only one that rounds one factor to the nearest halfway point and the other factor to the nearest 10.*

D: *It is the only one that kept one factor the same and rounded the other to the nearest 10.*

Pairs | 15 min

Presentation Screens



Activity 1 Andrea's Wonderings, Part 1

Purpose: Students demonstrate their understanding of multi-digit multiplication (4-digit by 1-digit and 2-digit by 2-digit) and use estimation to check for reasonableness. This prepares them to consider new number cases in Activity 2.

1 Launch



Say, "Gil gives Andrea a quick tour of his school before class starts. She wonders about everything she sees."

Read aloud Problem 1. Demonstrate reading with prosody to illustrate expression, rising and falling intonation patterns, pitch, and timing. ELPS 1.A, 1.E, 3.H

Ask, "Will Andrea need more or fewer than 2,318 connecting cubes to cover the bathroom floors? How do you know?" Invite students to paraphrase Problem 1 using their own words to demonstrate reading comprehension. ELPS 3.G

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

A **Accessibility: Executive functioning** Vary the task demands by having students complete Problem 1 and then Problem 3.

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, "What compatible number is 2,318 close to? What compatible number is 9 close to? How could that help you write an equation to estimate how many cubes Andrea will need?"
- Ask, "What are some multiplication strategies you have used before? How could those help you get started here?"

3 Connect



Invite students to share their estimation equations for Problem 1. Select and sequence their responses using the *Differentiation* table, and display any equations students do not share.

Record students' responses as they share.

Use Think-Pair-Share routine. Ask:

- "Are all estimates shown reasonable? What does it mean to say that an estimate is reasonable?"
- "How does estimation help you when multiplying multi-digit numbers?"

EB **Emergent Bilinguals** Invite students to restate the question in their own words and to ask any clarifying questions. ELPS 1.E, 2.D, 2.F

Key Takeaway: Say, "Estimation can help you predict the size of your product. You can refer back to your estimate after using a multiplication strategy to see if your answer is reasonable."

Student Edition

Unit 3 Lesson 2

Name _____ Date _____

TEKS 5.1.A, 5.1.B, 5.3.A

Answering Andrea's Questions

Let's multiply to determine products and use estimation to check for reasonableness.



Warm-Up eyes on teacher

We are a math community. How is being a member of a math community helpful for mathematicians?

Activity 1 Andrea's Wonderings, Part 1

For each problem, write an equation to represent an estimate. Then solve each problem using any strategy. Sample equations and work shown.

1 Andrea imagines covering the floor of every bathroom in the school with connecting cubes. She thinks it will take 2,318 connecting cubes to cover 1 bathroom floor. Using Andrea's prediction, how many connecting cubes will it take to cover the floors of all 9 bathrooms in the school?

Show your thinking.

estimate equation: 2,300 × 10 = 23,000

	2,000	300	10	8
9	18,000	2,700	90	72

18,000
2,700
90
+ 72
20,862

answer: 20,862 connecting cubes

Activity 1

Name _____ Date _____

Andrea's Wonderings, Part 1 (continued)

2 Andrea then imagines that each classroom has 18 pet hamsters. If there are 39 classrooms, how many pet hamsters would be at the school?

Show your thinking.

estimate equation: 40 × 20 = 800

	30	9
10	300	90
8	240	72

300
240
90
+ 72
702

or

	39
10	390
8	312

390
+ 312
702

answer: 702 hamsters

3 Discuss Oral activity: No writing expected.

- Compare your estimates with your answers for each problem. Are your estimates reasonable? How do you know?
- How does estimating before solving help you make sure your answer is reasonable?

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Estimate by rounding both factors to the nearest 10.	2,320 × 10 = 23,200	S **Strengthen** Ask, "Is your product reasonable based on your estimate? Why or why not?"
Estimate by rounding both factors to the greatest place value.	2,000 × 10 = 20,000	
Estimate by rounding 1 factor.	2,318 × 10 = 23,180 or 2,000 × 9 = 18,000	S **Stretch** Ask, "Would this estimation strategy always work, no matter the factors? Why or why not?"

Pairs | 20 min

Activity 2 Andrea's Wonderings, Part 2

Purpose: Students determine products of greater multi-digit factors (5 digit by 1 digit and 3 digit by 2 digit) and use estimation to check for reasonableness.

Presentation Screens



Short on time? Consider discussing Problem 5 as a class.

1 Launch



Read aloud the directions and Problem 4.

Ask, "What is similar and what is different about this situation compared to Problem 1?"

Say, "Complete Problems 4 and 5 with your partner. Then you will join another pair to complete Problem 6."

EB **Emergent Bilinguals** Pair students with different levels of English language proficiency together as they complete this activity. This will provide a structured opportunity for Multilingual Learners to interact with and receive feedback from their peers with varied language backgrounds. ELPS 1.C, 1.E, 2.C

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 strategies from Activity 1 could you use to get started?"

A **Accessibility: Visual-spatial processing** Vary the task demands by providing students with a partially completed area model and inviting them to fill in the model based on the information they know.

3 Connect



Invite students to share their work for Problem 5.

Record students' strategies. Consider displaying partial products strategies or a compatible-numbers strategy if they have not already been shared by students.

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

Use the Think-Pair-Share routine. Ask:

- "How are these strategies similar? How are they different?"
- "How did you use your estimate to determine whether your answer was reasonable?"

Key Takeaway: Say, "When multiplying multi-digit numbers, you can use familiar strategies in which you decompose factors in different ways, including by place value. You can use your estimate to determine whether your answer is reasonable."

Student Edition

Activity 2

Name _____ Date _____

Andrea's Wonderings, Part 2

For each problem, write an equation to represent an estimate. Then solve each problem using any strategy.
Sample equations and work shown.

4 Andrea wonders about the amount of water used by all 9 schools in Gil's town in 1 year. If each school uses 42,318 gallons of water each year, how many gallons do all the schools use in 1 year?

Show your thinking.

estimate equation: 40,000 × 9 = 360,000

```
  42,318
×       9
-------
     72
    90
  2,700
 18,000
+360,000
-------
 380,862
```

or

42,318 × 10 = 423,180
423,180 − 42,318 = 380,862

```
  423,180
−  42,318
----------
  380,862
```

answer: 380,862 gallons

Activity 2

Name _____ Date _____

Andrea's Wonderings, Part 2 (continued)

5 Andrea wonders about the books in the library. She counts 29 shelves. If each shelf has 318 books, how many books are in the library?

Show your thinking.

estimate equation: 300 × 30 = 9,000

	300	10	8
20	6,000	200	160
9	2,700	90	72

```
 6,000
   200
   160
 2,700
    90
+   72
-----
 9,222
```

answer: 9,222 books

6 Discuss Oral activity: No writing expected.

Join another pair.

- Are each of your answers reasonable? How do you know?
- Share and compare your strategies for each problem. How are they similar? How are they different?
- Share and compare your partial products for each problem. How are they similar? How are they different?

Presentation Screens

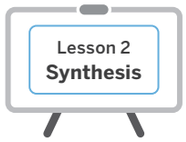
D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Determine some of the partial products.	300 × 9 = 2,700 10 × 9 = 90 8 × 9 = 72 2,862	**Support** Ask, "Is your product reasonable based on your estimate? How could you make sure that each part of each factor gets multiplied by each part of the other factor?"
Decompose at least 1 factor and use a combination of place value and other strategies, such as known multiplication facts and the properties of operations, to make partial products.	300 × 20 = 6,000 300 × 9 = 2,700 10 × 29 = 290 8 × 20 = 160 8 × 9 = 72 318 × 29 = 9,222	**Strengthen** Ask, "What is another way you could decompose the factors? Will that result in the same product?"
Decompose both factors using place value.	300 10 8 20: 6,000 200 160 9: 2,700 90 72 6,360 + 2,862 = 9,222	**Stretch** Ask, "What are other ways you could have decomposed the factors? Why did you decompose the factors the way you did?"

Whole Class | 10 min

Synthesis

Presentation Screen



Lesson Takeaway: Known strategies and representations can be used to apply the Distributive Property when multiplying multi-digit factors. Estimation can be used to check for reasonableness after calculating a product.



Say, "Here are Expressions A and B and their estimated products."

Ask:

- "What do you notice about the place value of each estimate?"
- "How could estimation be helpful when solving real-world problems involving multiplication of large multi-digit factors?"

Play the animation. ELPS 1.F

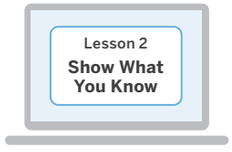
Say, "You can use known multiplication strategies, estimation, and place value understanding to multiply numbers with larger multi-digit factors. Estimating the solution to a real-world problem can be a helpful way to check your answer for reasonableness."

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

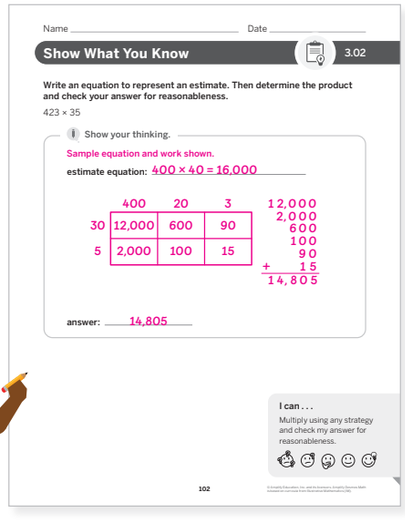
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.02

Write an equation to represent an estimate. Then determine the product and check your answer for reasonableness.

423 × 35

Show your thinking.

Sample equation and work shown.

estimate equation: 400 × 40 = 16,000

	400	20	3
30	12,000	600	90
5	2,000	100	15

12,000
2,000
600
100
90
+ 15
14,805

answer: 14,805

I can . . .
Multiply using any strategy and check my answer for reasonableness.

102

Today's Goals

1. **Goal:** Multiply multi-digit numbers using any strategy.
   - In the *Show What You Know*, students solved a three-digit by two-digit multiplication equation using any strategy.
2. **Goal:** Use estimation to check for reasonableness.
   - In the *Show What You Know*, students estimated before solving and used their estimation to check their work.
3. **Language Goal:** Justify that an answer is reasonable using estimation. **(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 2
Practice

Students using digital

Students using print

Summary 3.02

You can use what you know about estimation and place value to multiply multi-digit numbers and check for reasonableness.

18 × 39

estimate:
20 × 40 = 800

	30	9
10	300	90
8	240	72

300 + 240 + 90 + 72 = 702

702 is a reasonable product because it is close to the estimated product of 800.

Practice 3.02

For Problems 1 and 2, write an equation to represent an estimate. Then determine the product and check for reasonableness.
Sample equations and work shown.

Show your thinking.

1 3,516 × 8

estimate equation: 4,000 × 8 = 32,000

	3,000	500	10	6
8	24,000	4,000	80	48

24,000
4,000
80
+ 48
28,128

answer: 28,128

Grade 5 Unit 3 Lesson 2 192 Summary | Practice

Practice 3.02

Name _____ Date _____

Show your thinking.

2 48 × 45

estimate equation: 50 × 50 = 2,500

	40	8
40	1,600	320
5	200	40

1,600
320
200
+ 40
2,160

answer: 2,160

3 Choose the best estimate for the expression 954 × 73.

A 900 × 70 = 63,000
B 1,000 × 80 = 80,000
C 80 × 70 = 56,000
D 1,000 × 60 = 60,000

4 Determine the value of the expression 954 × 73 from Problem 3.

Show your thinking. Sample work shown.

	900	50	4
70	63,000	3,500	280
3	2,700	150	12

63,000
3,500
280
2,700
150
+ 12
69,642

answer: 69,642

Grade 5 Unit 3 Lesson 2 193 Practice

Practice 3.02

Name _____ Date _____

5 Which area model represents the product 782 × 63?

A

	7	8	2
6	42	48	12
3	21	24	6

B

	700	80	2
6	4,200	480	12
3	2,100	240	6

C

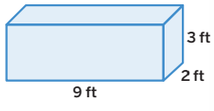
	700	80	2
60	42,000	4,800	120
3	2,100	240	6

D

	700	8	2
60	42,000	480	120
3	2,100	24	6

Spiral Review

6 Which expressions represent the volume of the rectangular prism in cubic feet? Select *all* that apply.



A 2 × 3 × 9
B 9 × 5
C 18 + 18 + 18
D 18 × 2
E 27 × 3
F (9 × 2) × 3

For Problems 7–10, determine the value of the expression.

7 80 × 80 6,400
8 70 × 90 6,300
9 1,224 ÷ 4 306
10 4,510 ÷ 5 902

Grade 5 Unit 3 Lesson 2 194 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 2	1	5.3.A
Test Practice	3	1	5.3.A
	4, 5	1	*5.3.B
Spiral Review			
	6	2	5.6.B
Fluency	7, 8	1	4.4.D
	9, 10	1	4.4.F

*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 2

Lesson Goal: Multiply multi-digit numbers using any strategy.

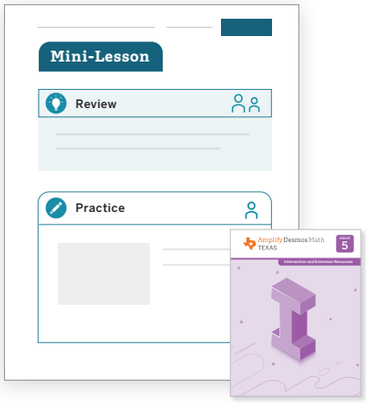
Support

Provide targeted intervention for students by using these resources.

If students determine some of the partial products:

Respond:

- Assign the *Estimating and Finding Products of Multi-Digit 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.



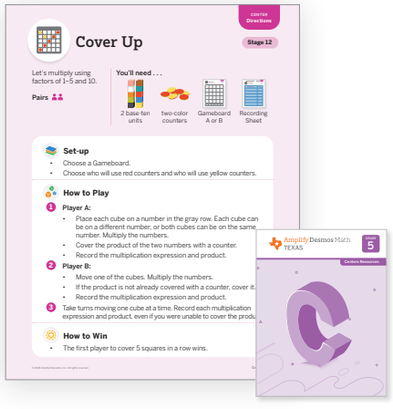
Strengthen

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

If students decompose 1 factor using place value understanding to determine the product:

Respond:

- Invite students to play these **Centers**. | 15 min
  Cover Up: Two-Digit Factors
  Equation Challenge:
  - *Two-Digit Factors*
  - *Multi-Digit Factors*
- Have students complete **Lesson 2 Practice**. | 15 min
- **Item Bank**



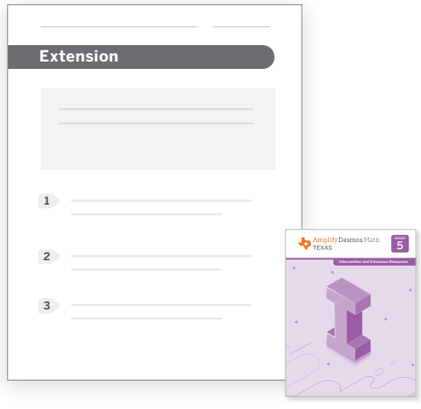
Stretch

Challenge students and extend their learning with these resources.

If students decompose both factors using place value understanding to determine the product:

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, e.g., *product/producto*
- Frayer Model templates
- Vocabulary routines



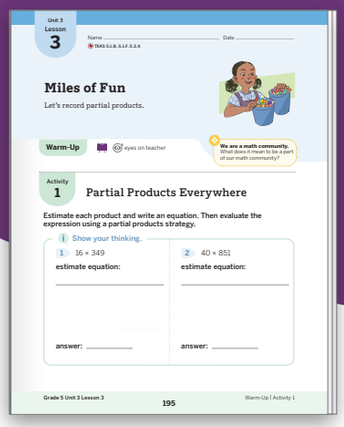


Professional Learning

What unfinished learning or misunderstandings do your students have about multiplication? How can you leverage those misconceptions in a positive way to further the understanding of the class?

Unit 3
Lesson
3

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



Miles of Fun

Representing Values of Expressions Involving Multi-Digit Factors

Let's record partial products.

Key Concepts

Today's Goals

1. **Goal:** Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division.
2. **Goal:** Multiply multi-digit whole numbers using partial products strategies.
3. **Language Goal:** Interpret and compare different partial products strategies for multiplying multi-digit whole numbers. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use partial products strategies to solve real-world problems involving multi-digit factors. They analyze and compare different ways to decompose factors as they apply the Distributive Property to multiply. Students connect and communicate the relationship between place value and the factors. Students discover that decomposing factors by place value is one way to organize partial products. **(TEKS 5.1.B, 5.1.F)**

Prior Learning

In Lesson 2, students used familiar strategies to determine the product of situations involving multi-digit multiplication, including five-digit by one-digit and three-digit by two-digit factors.

Future Learning

In Lesson 4, students will apply what they know about partial products strategies to evaluate expressions using partial products algorithms.

Integrating Rigor in Student Thinking

- Students evaluate multiplication expressions to build their **procedural skills**.
- Students **apply** their understanding of multiplication to solve real-world problems.

Vocabulary

Review Vocabulary

factor

partial product

TEKS

Addressing

5.3.A

Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, **multiplication,** or division.

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

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

Building On	Building Toward
4.4.D	5.3.B

Building Math Identity

We are a math community.
What does it mean to be a part of our math community?

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

Lesson at a Glance

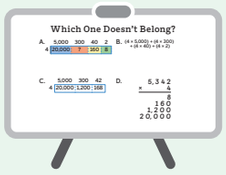
60 min

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

Warm-Up

Whole Class | 10 min

Students use the **Which One Doesn't Belong?** routine to compare different partial products strategies used to multiply the same 2 factors. 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 | 35 min

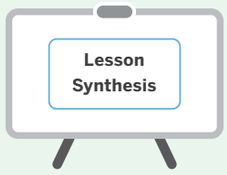
Students use partial products strategies to evaluate expressions and solve real-world problems involving multi-digit factors. They compare decomposition strategies, recognizing that more decompositions result in more partial products, and they relate all strategies to the Distributive Property.



Synthesis

Whole Class | 10 min

Students review and reflect on different ways to use partial products strategies to multiply a four-digit factor by a two-digit factor.

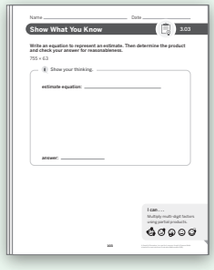


Show What You Know

Independent | 5 min

Students demonstrate their understanding by using a partial products strategy to determine the product of a three-digit by two-digit expression.

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
- ✓ Frayer Model
- ✓ 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.

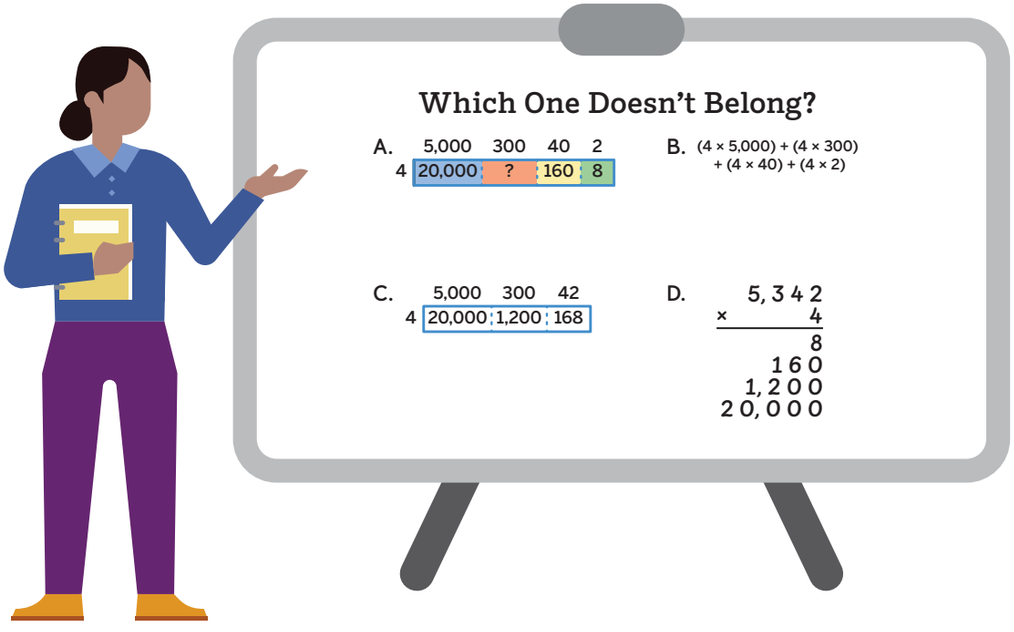
Whole Class | 10 min

Presentation Screen



Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare diagrams and expressions that represent the multiplication of the same four-digit by one-digit factors to represent products as the sums of partial products.





1 Launch

Display the 4 diagrams and expressions.

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 does each representation show a partial products strategy?"

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

A: *It is the only one that shows the product in an area diagram decomposed by place value.*

B: *It is the only one that shows partial products as a single expression.*

C: *It is the only one that did not decompose 5,342 by place value.*

D: *It is the only one that shows partial products vertically.*

Pairs | 35 min

Activity 1 Partial Products Everywhere

Purpose: Students solve real-world problems involving multi-digit factors by using partial products strategies. They compare decomposition strategies and consider how each reflects the Distributive Property.

Presentation Screens



Short on time? Consider omitting Problems 1 and 4.

1 Launch



Say, Andrea sees an Apollo 11 poster in the hallway at school. She wants to learn more about the spaceflight and wonders how far the astronauts traveled during different phases of the mission. For Problems 1–4, estimate and solve using a partial products strategy.

Read aloud the introduction and Problems 1–4.

EB **Emergent Bilinguals** Students may be unfamiliar with the term *partial products*. Consider reviewing what a partial products strategy is so it is clear how students will be solving. ELPS 1.B

A **Accessibility: Memory and attention** Vary the task demands by having students focus on completing Problems 1 and 3 before moving on to Problem 5. Check in to provide feedback and encouragement after each problem.

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 strategies have you used before that you can use to determine the total?"
- Ask, "How can you decompose one or both factors to help you multiply?"

3 Connect



MLR This Connect is structured using the *MLR7: Compare and Connect* routine. ELPS 1.E, 2.B, 2.D, 2.E

Invite students to share their strategies for Problem 3, displaying each strategy as they share. Consider showing students' work in which they decomposed only 1 factor and in which they decomposed both factors.

Use the Think-Pair-Share routine. Ask:

- "How are the strategies similar? How are they different?"
- "How does each strategy use the Distributive Property?"

Key Takeaway: Say, "When multiplying multi-digit numbers, you can decompose factors in different ways, including by place value. No matter how the factors are decomposed, you can apply the Distributive Property to multiply each part of 1 factor by each part of the other factor."

Unit 3 Lesson 3

Name _____ Date _____

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

Miles of Fun

Let's record partial products.



Warm-Up eyes on teacher

We are a math community. What does it mean to be a part of our math community?

Activity 1

Partial Products Everywhere

Estimate each product and write an equation. Then evaluate the expression using a partial products strategy.

Show your thinking. Sample equations and work shown.

1 16 × 349

estimate equation: 16 × 300 = 4,800

300 × 16 = 4,800
40 × 16 = 640
9 × 16 = + 144
5,584

answer: 5,584

2 40 × 851

estimate equation: 40 × 800 = 32,000

800 × 40 = 32,000
50 × 40 = 2,000
1 × 40 = 40

answer: 34,040

Activity 1

Name _____ Date _____

Partial Products Everywhere (continued)

In 1969, the Apollo 11 mission traveled from Earth to the Moon. This fulfilled President John F. Kennedy's commitment to sending the first-ever astronauts to land on the moon and return safely to Earth.

Show your thinking. Sample work and equations shown.

3 Andrea wonders, "If Apollo 11 orbited the Moon for 21 hours with an average speed of 2,200 miler per hour, how many miles did Apollo 11 orbit around the Moon?"

estimate equation: 20 × 2,000 = 40,000

	2,000	200
20	40,000	4,000
1	2,000	200

40,000
4,000
2,000
+ 200
46,200

answer: 46,200 miles

4 Andrea wonders, "If it took 76 hours for Apollo 11 to reach the Moon's orbit traveling at an average speed of 24,000 miles per hour, how many miles did Apollo 11 travel to reach the Moon's orbit?"

estimate equation: 80 × 20,000 = 1,600,000

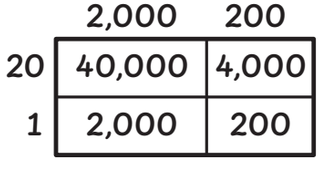
20,000 × 70 = 1400,000
20,000 × 6 = 120,000
4,000 × 70 = 280,000
4,000 × 6 = 24,000

1
1,400,000
120,000
280,000
24 000
+ 1,824,000

answer: 1,824,000 miles

Presentation Screens

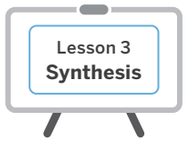
D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Decompose one or both factors and determine some of the partial products.	2,000 × 20 = 40,000 200 × 1 = 200 0 × 1 = 0	**Support** Ask, "How did you keep track of multiplying each part of one factor by each part of the other factor?"
Decompose at least one of the 2 factors using place value, including zeros between non-zero digits.	2,000 × 20 = 40,000 2,000 × 1 = 2,000 200 × 20 = 4,000 200 × 1 = 200 0 × 20 = 0 0 × 1 = 0	**Strengthen** Ask, "How do the equations 0 × 20 = 0 and 0 × 1 = 0 impact your total product?"
Decompose both factors using place value, skipping zeros between non-zero digits.		**Stretch** Ask, "How would your strategy work if you were multiplying 2,202 × 21?"

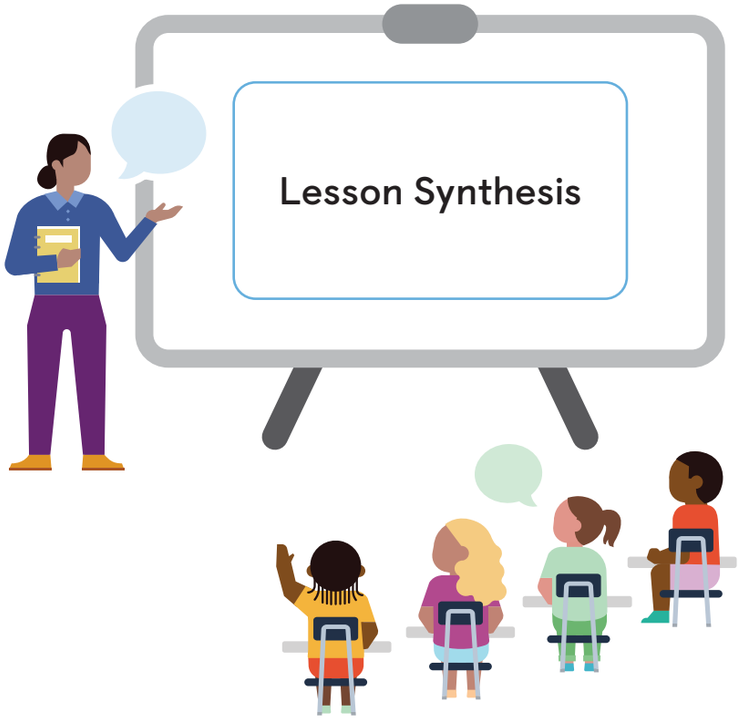
Whole Class | 10 min

Synthesis

Presentation Screen



Lesson Takeaway: When multiplying multi-digit numbers, both factors can be decomposed many ways, including by place value. As long as each part of each factor is multiplied by each part of the other, the product will be the same.



Use the Think-Pair-Share routine. Ask, "How would you decompose each factor to determine the product of 1,450 × 35? Why?"

Play the animation. ELPS 1.F

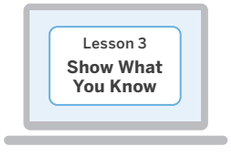
Say, "When evaluating a multiplication expression, you can use place value to decompose one or both factors. The more you decompose each factor, the more partial products you will have."

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

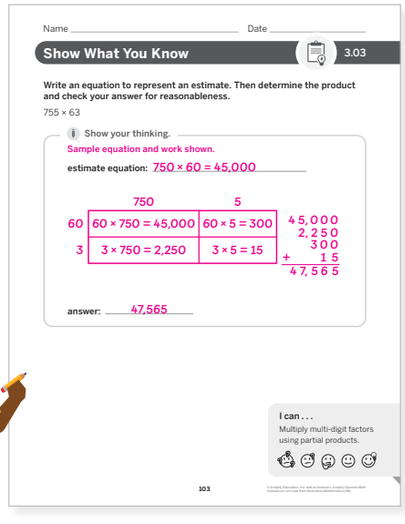
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.03

Write an equation to represent an estimate. Then determine the product and check your answer for reasonableness.

755 × 63

Show your thinking.

Sample equation and work shown.

estimate equation: 750 × 60 = 45,000

	750	5
60	60 × 750 = 45,000	60 × 5 = 300
3	3 × 750 = 2,250	3 × 5 = 15

45,000
2,250
300
+ 15
47,565

answer: 47,565

I can . . .
Multiply multi-digit factors using partial products.

103

Today's Goals

1. **Goal:** Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication or division.
   - In the *Show What You Know*, students estimated to determine the solution to a mathematical problem involving multiplication and addition.
2. **Goal:** Multiply multi-digit whole numbers using partial products strategies.
   - In the *Show What You Know*, students multiplied a three-digit by two-digit multiplication expression using a partial products strategy.
3. **Language Goal:** Interpret and compare different partial products strategies for multiplying multi-digit 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 3
Practice

Students using digital

Students using print

Summary 3.03

When multiplying multi-digit numbers, whether you decompose factors by place value or another way, the sum of all the partial products will be the same. The more you decompose each factor, the more partial products you will have.

284 × 37

	200	80	4
30	6,000	2,400	120
7	1,400	560	28

6,000
1,400
2,400
560
120
+ 28
10,508

284 × 37

(200 + 80 + 4) × (30 + 7)
200 × 30 = 6,000
200 × 7 = 1,400
80 × 30 = 2,400
80 × 7 = 560
4 × 30 = 120
4 × 7 = 28
6,000 + 1,400 + 2,400 + 560 = 9,800
560 + 120 + 28 = 708
9,800 + 708 = 10,508

Practice 3.03

1 Complete the statement so that it correctly shows the best estimate for the equation.

937 × 25

Select **ONE** correct answer in each box to complete the sentence.

The factor 937 best rounds to [A 1,000 / B 935] and the factor 25 best rounds to [A 25 / B 50] making the estimate [A 46,750 / B 25,000].

Practice 3.03

Name _____ Date _____

For Problems 2 and 3, write an equation to represent an estimate of the product. Then determine the product. Sample equations and work shown.

Show your thinking.

2 54,206 × 7

estimate equation: 50,000 × 7 = 350,000

50,000 × 7 = 350,000
4,000 × 7 = 28,000
200 × 7 = 1,400
6 × 7 = 42

350,000
28,000
1,400
+ 42
379,442

answer: 379,442

3 861 × 52

estimate equation: 900 × 50 = 45,000

800 × 50 = 40,000
800 × 2 = 1,600
60 × 50 = 3,000
60 × 2 = 120
1 × 52 = 52

40,000 + 1,600 + 3,000 + 120 + 52 = 44,772

answer: 44,772

Practice 3.03

Name _____ Date _____

4 Which expression has the greatest product? Explain your thinking. Sample explanation shown.

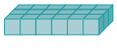
A 1,622 × 34
B 1,525 × 32
C 1,579 × 30
D 1,614 × 33

1,622 × 34 has the greatest product because both factors are greater than the factors in the other expressions.

Spiral Review

5 A box is filled with cubes. Each cube has a volume of 1 cubic centimeter. The base layer is shown. It takes 4 layers to fill the entire box. What is the volume of the box?

72 cubic centimeters



For Problems 6–9, determine the value of the expression.

6 60 × 60 3,600
7 20 × 80 1,600
8 8,190 ÷ 9 910
9 5,607 ÷ 7 801

For Problems 10 and 11, identify whether the number is a prime number or a composite number.

10 13 prime
11 25 composite

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	1	5.3.A
	2, 3	1	5.3.A
	4	2	5.3.A
Spiral Review			
	5	1	5.6.B
Fluency	6, 7	1	4.4.D
	8, 9	1	4.4.F
	10, 11	1	5.4.A

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: Multiply multi-digit whole numbers using partial products strategies.

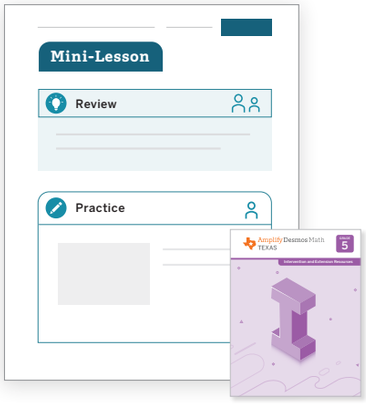
Support

Provide targeted intervention for students by using these resources.

If students decompose 1 or both factors and determine some of the partial products:

Respond:

- Assign the *Representing Multiplication With Area Diagrams* Mini-Lesson. | 15 min
- Review the Distributive Property.



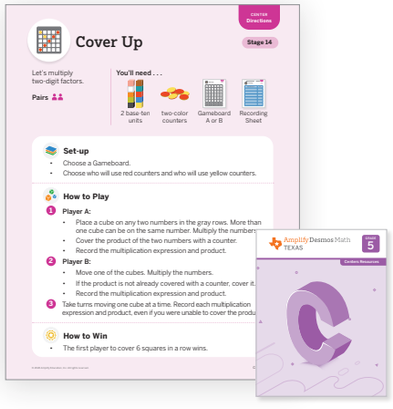
Strengthen

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

If students decompose both factors using place value:

Respond:

- Invite students to play these **Centers**. | 15 min
  Cover Up: Two-Digit Factors
  Equation Challenge:
  • Two-Digit Factors
  • Multi-Digit Factors
- Have students complete **Lesson 3 Practice**. | 15 min
- **Item Bank**



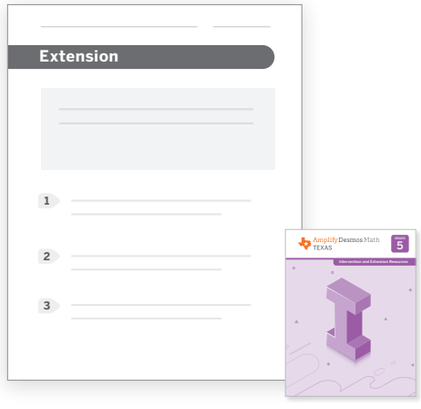
Stretch

Challenge students and extend their learning with these resources.

If students decompose both factors using place value and use estimate to check answer for reasonableness:

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, e.g., *factor/el factor*
- Frayer Model templates
- Vocabulary routines



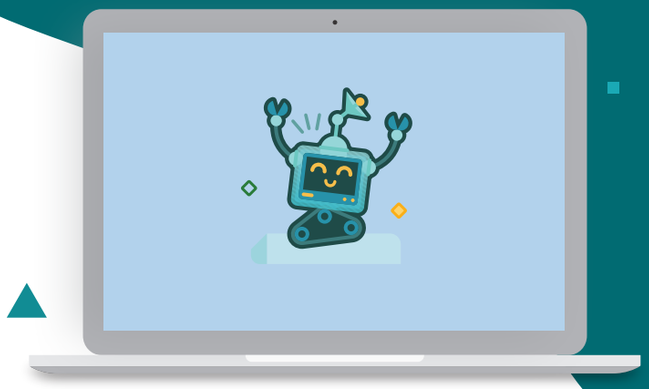
Professional Learning

In a future lesson, students will learn how to use the standard algorithm to multiply multi-digit numbers. How do the diagrams and expressions used in today's lesson support this work?

Unit 3
Lesson
4

Student devices recommended

Students can use devices to interact with this lesson. Student Edition pages are also available.



Partial Products Everywhere

Determining Products Using a Partial Products Algorithm

Let's use what we know about place value to multiply multi-digit numbers.

Key Concepts

Today's Goals

1. **Goal:** Multiply multi-digit whole numbers using a partial products algorithm.
2. **Language Goal:** Compare 2 ways of using a partial products algorithm. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students compare 2 ways of using a partial products algorithm and analyze how partial products are organized and recorded. They apply a partial products algorithm to fill in the missing digits of five-digit by one-digit and three-digit by two-digit multiplication expressions. **(TEKS 5.1.B, 5.1.E)**

Prior Learning

In Lesson 3, students used partial products strategies to multiply multi-digit factors. They described how the Distributive Property is applied across different partial products strategies.

Future Learning

In Lesson 5, students will evaluate three-digit by two-digit multiplication expressions using the standard algorithm.

Depth and Rigor of Student Thinking

- Students use partial products algorithms to continue building their **procedural skills** in multiplying multi-digit numbers.
- Students **apply** their understanding of multiplication to determine the missing digits in factors.

Vocabulary

Review Vocabulary

algorithm

partial product

product

TEKS

Building Toward

5.3.B

Multiply with fluency a three-digit number by a two-digit number using the standard algorithm.

Math Process Standards: 5.1.B, 5.1.E

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

Building On

4.4.D

Building Math Identity

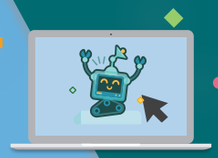
We are a math community.
What can you do to make sure all members of our math community feel included?

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

Lesson at a Glance

60 min

TEKS: 5.1.B, 5.1.E, Building Toward 5.3.B



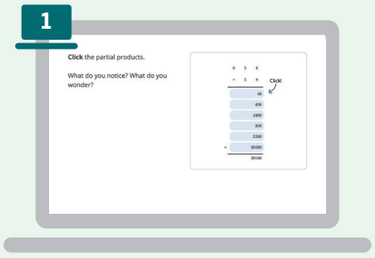
Why digital?

Students complete multiplication expressions that display the partial products of each factor 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 the digits in factors and partial products of a three-digit by two-digit multiplication expression. This prepares them to use and compare partial products algorithms in Activity 1.



Activity 1

Pairs | 15 min

Students use partial products algorithms to record partial products in 2 ways and compare the recording strategies. They see that starting with the least place value or the greatest place value will get the same partial products and the same product.

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

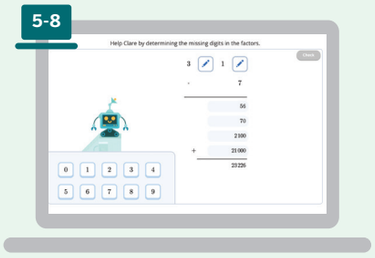


Activity 2

Pairs | 20 min

Students build upon their work in Activity 1 to determine missing digits in the factors when using partial products expressions.

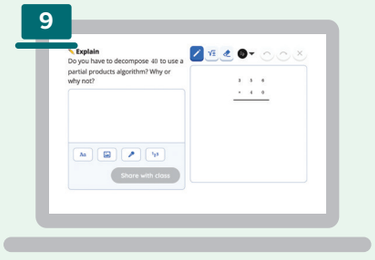
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on how to use a partial products algorithm with multi-digit numbers when one of the factors is a multiple of 10.

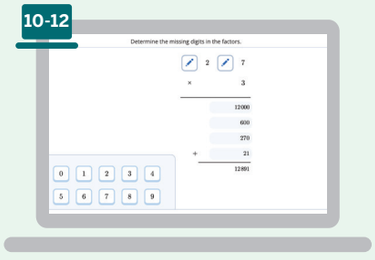


Show What You Know

Independent | 5 min

Students demonstrate their understanding by determining missing digits in factors of multi-digit multiplication expressions.

Students using print: *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.

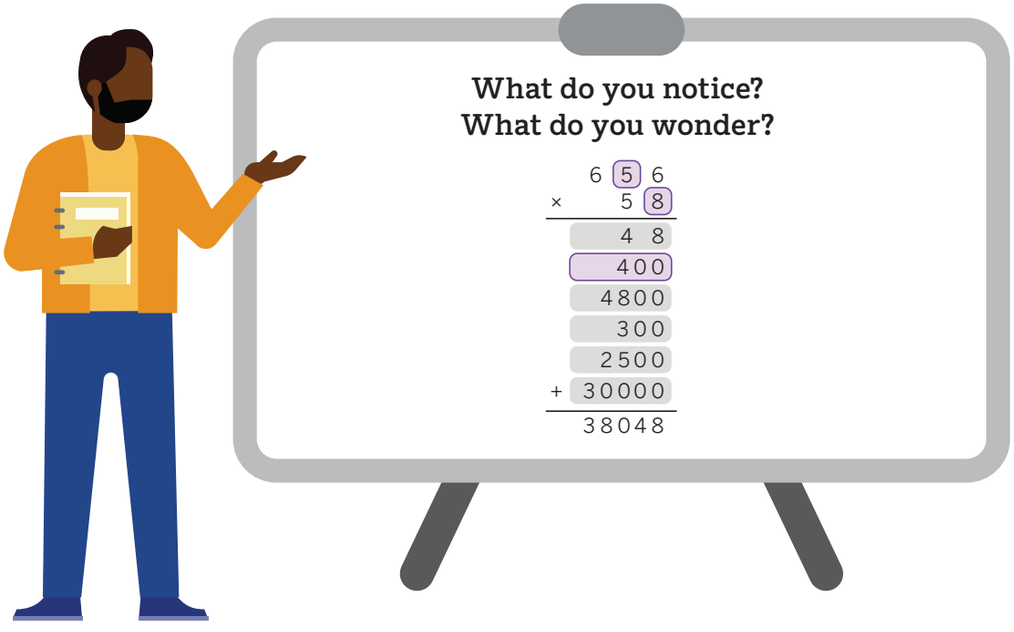
Whole Class | 10 min | Suggested Pacing: Screen 1

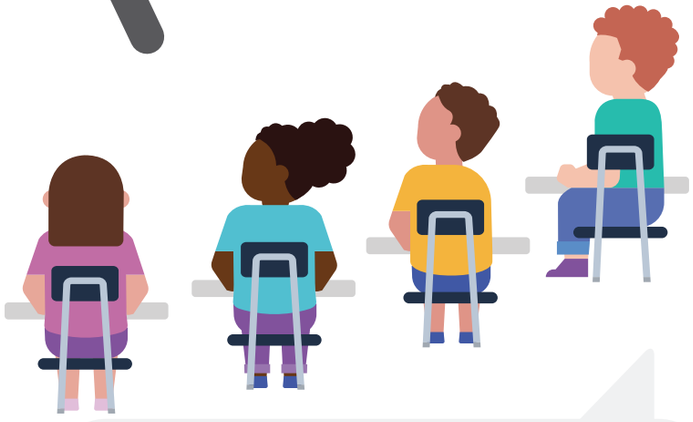
Warm-Up Notice and Wonder

Purpose: Students examine which digits in the factors of a multi-digit multiplication expression create each partial product to prepare for comparing partial products algorithms 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 which partial products to click.

2 Connect

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

   Ask, "How can the place value of each digit help you record each partial product?"

Students might say . . . ELPS 2.B

I notice that when I click on a partial product, the 2 digits that make that partial product are highlighted.

I notice that the list of partial products shows each digit in 58 is multiplied by each digit in 656.

I wonder if this strategy works for any number of digits in either factor.

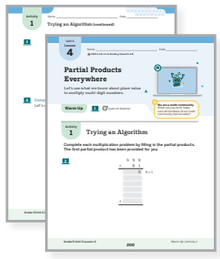
I wonder if the partial products could be shown in any order.

Pairs | 15 min | Suggested Pacing: Screens 2–3, Screen 4

Activity 1 Trying an Algorithm

Purpose: Students apply partial products algorithms to multi-digit multiplication expressions to recognize that the order in which the factors are multiplied does not matter and the product will be the same.

Students using print



1 Launch



2-3 **Say**, "Complete Screens 2 and 3 with your partner."

Students using print: Display Screen 2. Ask students to use the given partial products to help them fill in the remaining partial products using the space below the multiplication equation.

A **Accessibility: Conceptual processing** Provide students with paper to write their calculations on.

2 Monitor



After students have completed **Screen 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

2-3 **If students need help getting started . . .**

- Ask, "What are the values of the digits being multiplied? How could that help you determine the partial products?"
- **Students using print:** Ask, "How was the product 9 determined? How could that thinking help you determine the other partial products?"

3 Connect



4 **Use the Think-Pair-Share routine**. Invite students to take turns sharing how Strategy A and Strategy B are similar and different with their partners.

Ask:

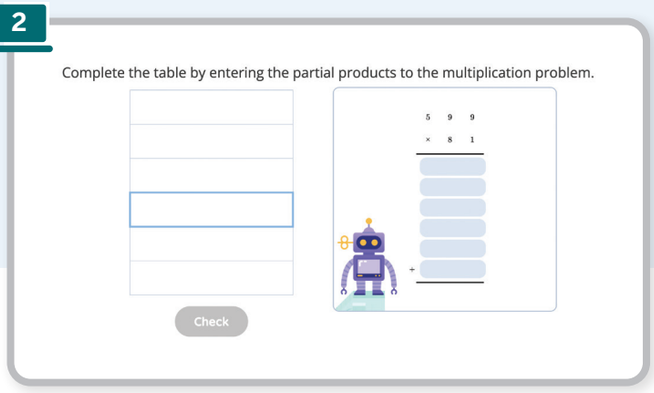
- "Why does it make sense that all the partial products are the same?"
- "Why does it make sense that the final products are the same?"

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

Key Takeaway: Say, "A partial products algorithm involves decomposing the factors by place value and multiplying the value of each part of one factor by the value of each part of the other factor. You can multiply right to left or left to right, and you will get the same partial products, and therefore, the same final product."

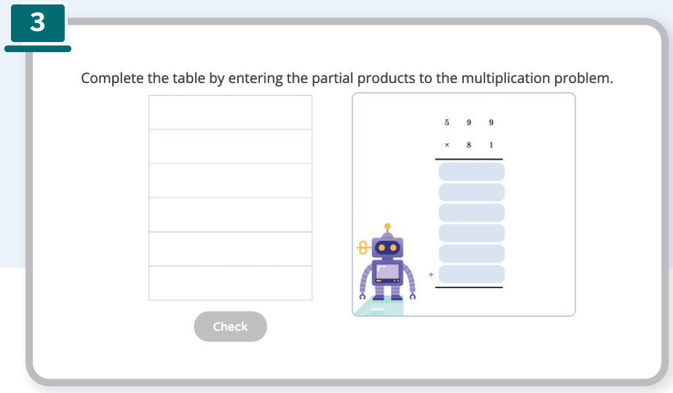
Students using digital

2



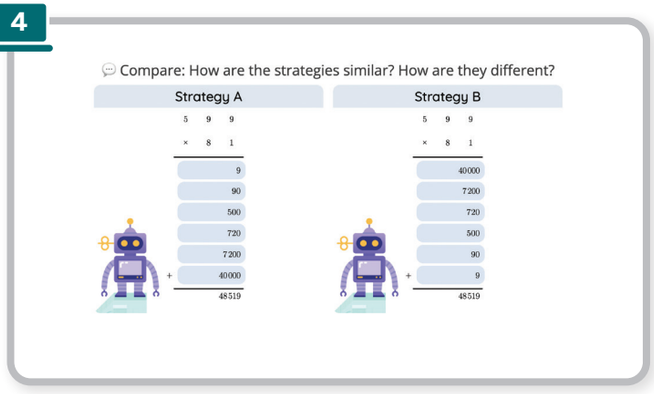
Students enter partial products into the table, such as 90 to represent 90×1.

3



Students enter partial products into the table, such as 7,200 to represent 90×80.

4



Students discuss similarities and differences between 2 strategies, such as noticing that the partial products are the same, just in different orders.

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

D Differentiation | Teacher Moves

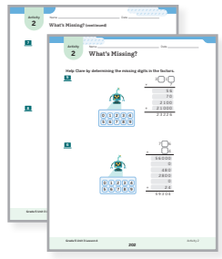
Look for students who . . .	For example . . .	Provide support . . .
Almost there Multiply any 2 highlighted digits as though multiplying 2 ones.	$5 \times 8 = 40$ $90 \times 8 = 720$ $900 \times 8 = 7{,}200$ $5 \times 10 = 50$ $90 \times 10 = 900$ $900 \times 10 = 9{,}000$	**Support** Ask, "What are the place values of the first 2 highlighted digits? What should the place value of the first partial product be?"
Multiply any 2 highlighted digits and consider the place value of the digits to determine the place value of the partial product.	$500 \times 80 = 40{,}000$ $90 \times 80 = 7{,}200$ $9 \times 80 = 720$ $500 \times 1 = 500$ $90 \times 1 = 90$ $9 \times 1 = 9$	**Stretch** Ask, "Will this strategy work with any number of digits in both factors? Why or why not?"

Pairs | 20 min | Suggested Pacing: Screens 5–8

Activity 2 What's Missing?

Purpose: Students analyze partial products and use place value reasoning to fill in missing digits in one or both factors of multiplication expressions with multi-digit numbers.

Students using print



1 Launch



5-8 **Say**, "Clare completed several partial products problems, but some numbers were erased. Analyze Clare's strategy for each problem and determine the missing digits. Complete Screens 5–8 with your partner."

2 Monitor



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

5-8 **If students need help getting started . . .**

- Ask, "What 2 digits were multiplied to result in the first partial product?"
- Ask, "How could you determine which partial product is connected to the missing digit? How could you use that to help you determine the missing digits?"

3 Connect



8 **Invite students to share** their responses from Screen 8 and how they used known facts that made every partial product true.

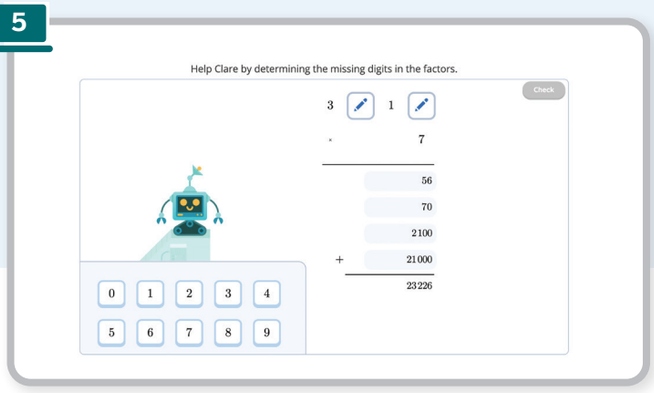
Use the Think-Pair-Share routine.

Ask, "How did you use place value understanding to help you fill in the missing digits?"

Key Takeaway: Say, "When using a partial products algorithm, you can use place value understanding and known facts to fill in missing digits of one or both factors."

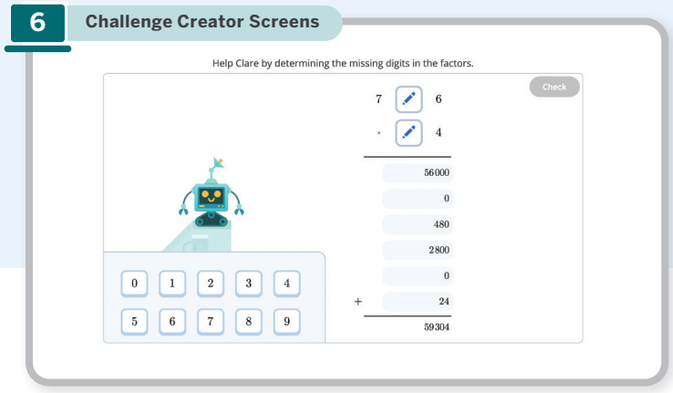
Students using digital

5



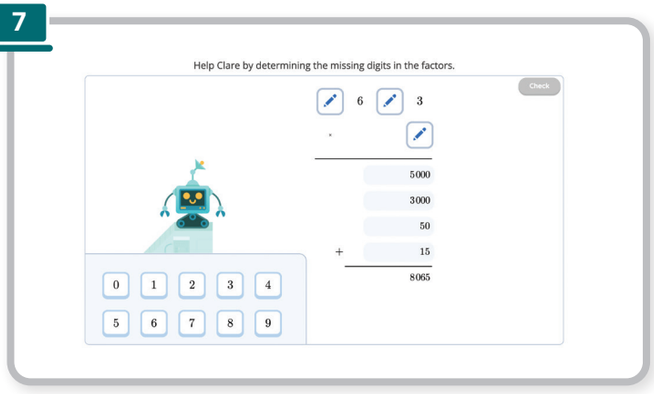
Students determine the missing digits in the factors, such as 8 in the ones and 3 in the hundreds.

6 **Challenge Creator Screens**



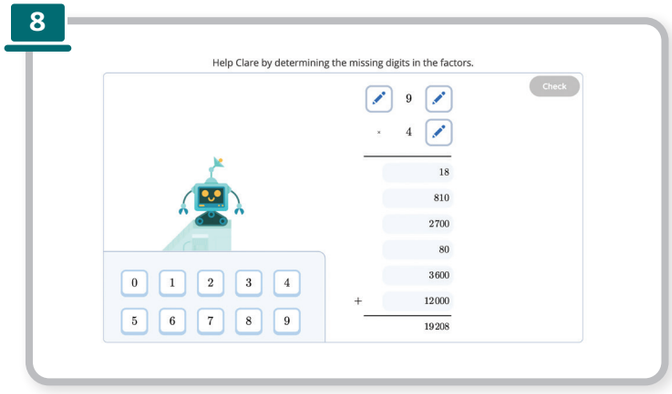
Students determine the missing digits in the factors, such as 0 to make 706 and 8 to make 84.

7



Students determine the missing digits in the factors, such as 5 and 1 and 1 to make 1, 613.

8



Students determine the missing digits in the factors, such as 9 to make 42 and 3 and 2 to make 392.

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

D Differentiation | Teacher Moves

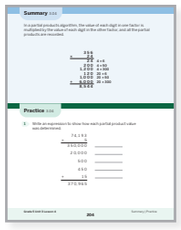
Look for students who . . .	For example . . .	Provide support . . .
Almost there Use any known facts that create one partial product.	96 × 43 18 810 2700	**Support** Ask, "How could you check that the digits work to make *all* the partial products?"
Use known facts that create all partial products.	32 × 49 18 810 2700	**Strengthen** Ask, "How does knowing one of the missing digits help you determine the other missing digits?"

Whole Class | 10 min | Suggested Pacing: Screen 9

Synthesis

Lesson Takeaway: When using a partial products algorithm, factors are decomposed by place value. The value of each digit in one factor is multiplied by the value of each digit in the other factor, and all partial products are recorded.

Students using print





9 **Use the Think-Pair-Share routine**. Ask, "Do you have to decompose 40 to use a partial products algorithm? Why or why not?"

Say, "Using a partial products algorithm means that both factors get decomposed by place value. When one of the factors is a multiple of 10, you do not have to decompose it. You can multiply the parts of each factor in any order, but it is important to keep track of your partial products to make sure that each part of one factor is multiplied by each part of the other factor."

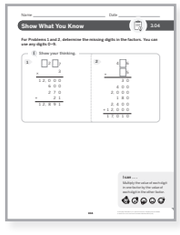
Invite students to refer to the **Summary** during Practice or anytime during the year.

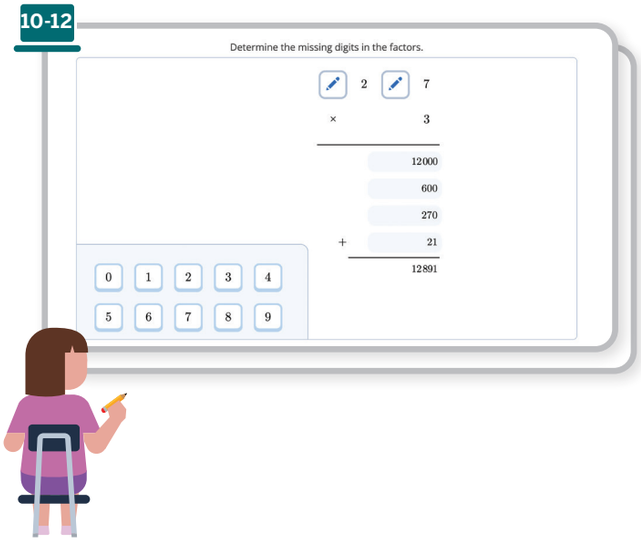
Show What You Know

Independent | 5 min |
Suggested Pacing: Screens 10–12

Students using print

(Show What You Know PDF)





Today's Goals

1. **Goal:** Multiply multi-digit whole numbers using a partial products algorithm.
   - In Problems 1 and 2 in the *Show What You Know*, students multiplied multi-digit whole numbers using the partial products algorithm.
2. **Language Goal:** Compare 2 ways of using a partial products algorithm. **(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 4
Practice

Students using digital

Students using print

Summary 3.04

In a partial products algorithm, the value of each digit in one factor is multiplied by the value of each digit in the other factor, and all the partial products are recorded.

	356	
×	24	
	24	4 × 6
	200	4 × 50
	1,200	4 × 300
	120	20 × 6
	1,000	20 × 50
+	6,000	20 × 300
	8,544	

Practice 3.04

1 Write an expression to show how each partial product value was determined.

	4,193	
×	5	
	20,000	4,000 × 5
	500	100 × 5
	450	90 × 5
+	15	3 × 5
	20,965	

Practice 3.04

Name _____ Date _____

2 Show the value of each partial product by filling in the boxes.

	1, 6 4 2	
×	9	
	9,000	1,000 × 9
	5,400	600 × 9
	360	40 × 9
+	18	2 × 9
	14,778	

3 Determine the product of the expression 252 × 50.

Record your answer in the space provided.

12,600

4 Use a partial products algorithm to determine the product of the expression 806 × 34. **Sample work shown.**

Show your thinking.

	806
×	34
	24
	3,200
	180
+	24,000
	27,404

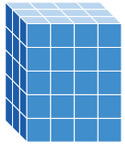
answer: 27,404

Practice 3.04

Name _____ Date _____

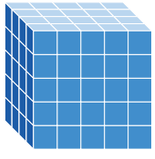
Spiral Review

For Problems 5 and 6, write an expression to represent the volume of the rectangular prism. Then determine the volume.
The order of the factors in the expression may vary.

5 

expression: 4 × 3 × 5

answer: 60 cubic units

6 

expression: 5 × 5 × 4

answer: 100 cubic units

For Problems 7–10, determine the value of the expression.

7 27 × 40 1,080

8 11 × 71 781

9 8,424 ÷ 4 2,106

10 6,480 ÷ 8 810

For Problems 11–14, use the table to determine the conversion.

1 gallon = 4 quarts
1 quart = 2 pints

11 2 gallons = 8 quarts

12 16 quarts = 4 gallons

13 4 quarts = 8 pints

14 1 gallon = 8 pints

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1, 2	1	5.3.B*
Test Practice	3	1	5.3.B
	4	1	5.3.B*
Spiral Review			
	5, 6	1	5.6.B
Fluency	7, 8	1	4.4.D
	9, 10	1	4.4.F
	11–14	1	4.8.A

*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 4

Lesson Goal: Multiply multi-digit whole numbers using a partial products algorithm.

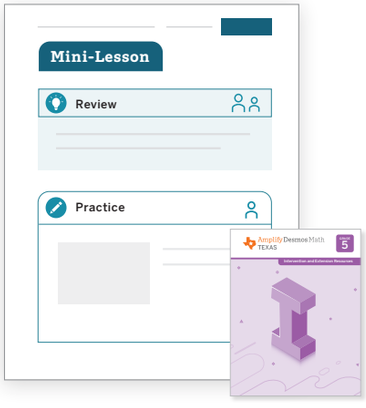
Support

Provide targeted intervention for students by using these resources.

If students guess and check to determine the missing factors:

Respond:

- Assign the *Finding Products Using a Partial Products Algorithm* Mini-Lesson. | 15 min
- Revisit Lesson 3.



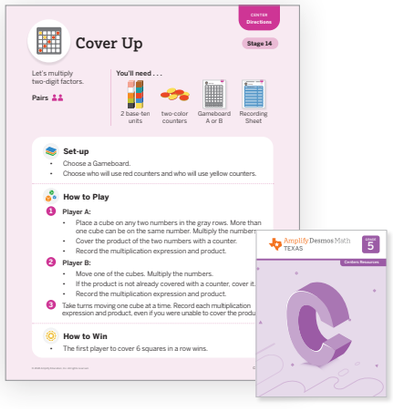
Strengthen

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

If students use partial products to identify some of the missing factors:

Respond:

- Invite students to play these **Centers**. | 15 min
  Cover Up: Two-Digit Factors
  Equation Challenge:
  - *Two-Digit Factors*
  - *Multi-Digit Factors*
- Have students complete **Lesson 4 Practice**. | 15 min
- **Item Bank**



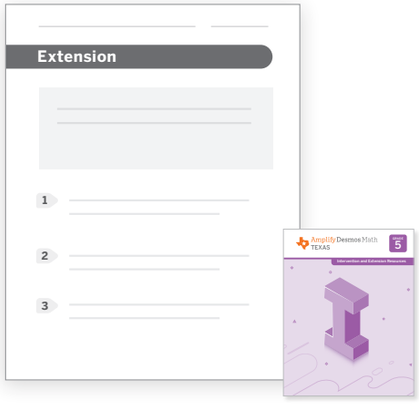
Stretch

Challenge students and extend their learning with these resources.

If students use the place value of the partial products to determine the missing factors:

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, e.g., *partial product/producto parcial*
- Frayer Model templates
- Vocabulary routines



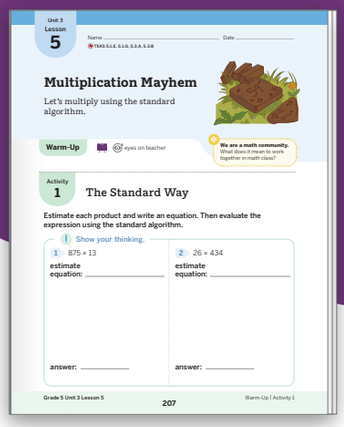


Professional Learning

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 3
Lesson
5

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


Unit 3 Lesson 5

Multiplication Mayhem

Let's multiply using the standard algorithm.

Warm-Up

Activity 1 The Standard Way

Estimate each product and write an equation. Then evaluate the expression using the standard algorithm.

Show your thinking.

1 875 × 13

estimate

equation:

answer:

2 26 × 434

estimate

equation:

answer:

Grade 5 Unit 3 Lesson 5 207 Warm-Up | Activity 1

Multiplication Mayhem

Multi-Digit Multiplication Fluency

Let's multiply using the standard algorithm.

Key Concepts

Today's Goals

1. **Goal:** Fluently multiply a three-digit number by a two-digit number using the standard algorithm.
2. **Language Goal:** Explain how the standard algorithm can be used to attend to the place value of regrouped values. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use the standard algorithm to evaluate three-digit by two-digit multiplication expressions where regrouping is necessary in multiple places. They ensure they attend to place value by organizing their work and estimating the products. Students then create and evaluate multiplication expressions in which regrouping is necessary in multiple places, reinforcing their understanding of how and why regrouping is used. They explain how the standard algorithm can be used to attend to the place value of regrouped values using precise language. **(TEKS 5.1.E, 5.1.G)**

Prior Learning

In Lesson 4, students used partial products to evaluate multi-digit multiplication expressions.

Future Learning

In Sub-Unit 2, students will divide with multi-digit divisors using what they know about place value. In Lesson 6, students will review what they know about division and estimate the place value of the quotient.

Integrating Rigor in Student Thinking

- Students build **fluency** with three-digit by two-digit multiplication using the standard algorithm.

Vocabulary

Review Vocabulary

factor

partial product

product

regroup

TEKS

Addressing

5.3.B

Multiply with fluency a three-digit number by a two-digit number using 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

Building On	Building Toward
4.4.D	6.3.E

Building Math Identity

We are a math community.
What does it mean to work together in math class?

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

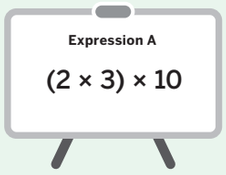
Lesson at a Glance 60 min

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

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 that lend themselves to the Distributive Property. **(TEKS 5.1.C, 5.1.D)**



Activity 1 Fluency

Pairs | 15 min

Students use the standard algorithm to evaluate three-digit by two-digit expressions where regrouping is necessary for 1 digit in the second factor. They explain how they used the standard algorithm to organize their work and evaluate the reasonableness of their answers using estimates.

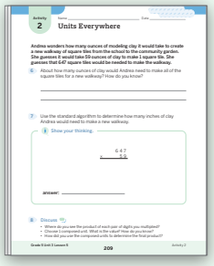


Activity 2 Fluency

Pairs | 20 min

Students use the standard algorithm to evaluate three-digit by two-digit expressions when regrouping is necessary for both digits in the second factor. They apply their work with the standard algorithm to create and evaluate a multiplication expression that results in at least 3 regrouped values.

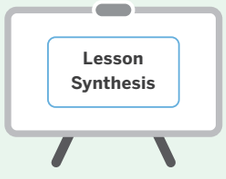
Materials: *Standard Algorithm: Place Value Template* PDF (as needed)



Synthesis

Whole Class | 10 min

Students review and reflect on what they now know about multiplication after having completed this sub-unit.

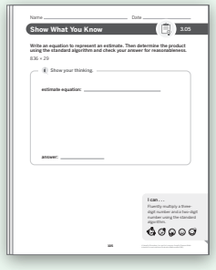


Show What You Know

Independent | 5 min

Students demonstrate their understanding by estimating and evaluating a three-digit by two-digit multiplication expression using the standard algorithm.

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 ✓ 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

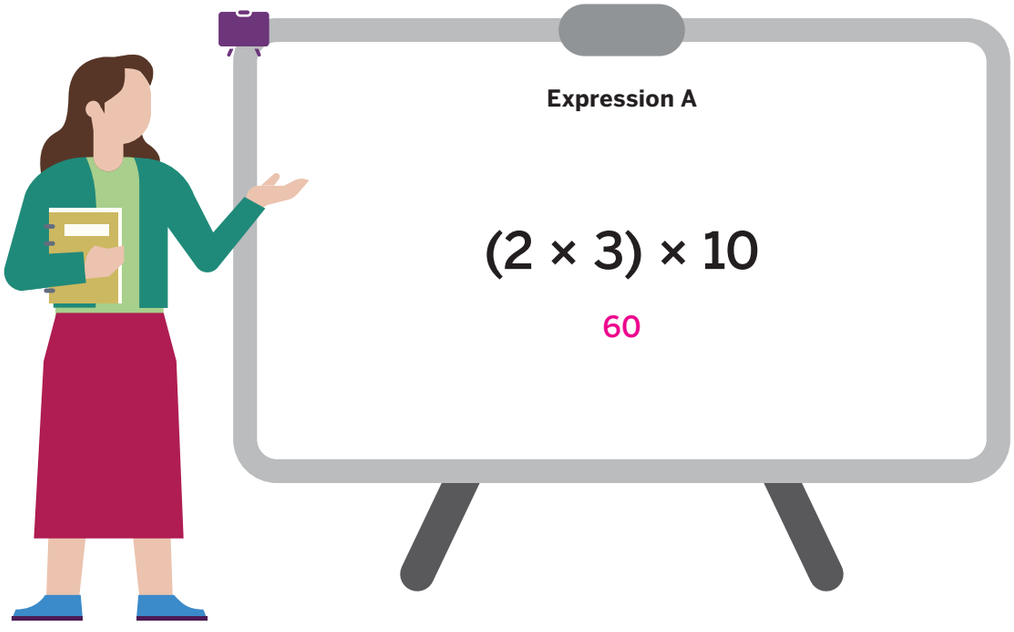
Presentation Screen



Warm-Up Number Talk

Fluency

Purpose: Students use strategies such as place value and properties of operations to multiply 3 factors, where 1 factor is 10, to prepare for using the standard algorithm fluently.



Expression B

(2 × 40) × 10

800

Expression C

(2 × 200) × 10

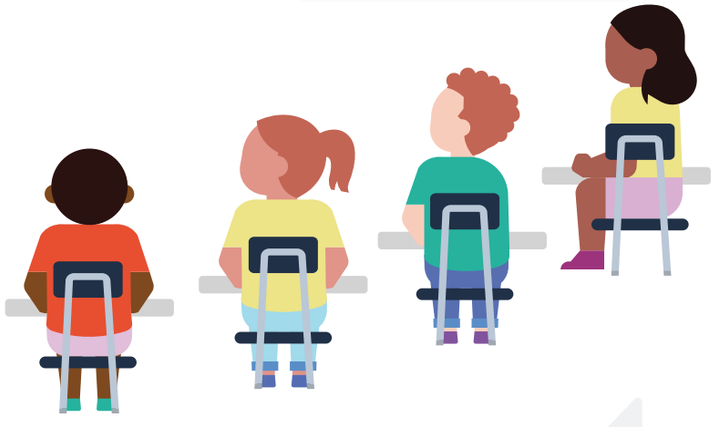
4,000

Expression D

(2 × 243) × 10

4,860

Why these problems? These expressions lend themselves to using the Distributive Property to determine a product using previous calculations.



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 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 Expression D.

Ask How did Expressions A–C help you evaluate Expression D?

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

A: I know 2 × 3 = 6 and 10 × 6 = 60.

B: 2 groups of 40 is 80, and 10 × 80 = 800.

C: 2 × 200 is 400, and 10 × 400 is 4,000.

D: Because 243 is the same as 200 + 40 + 3, I know the sum of (2 × 3) + (2 × 40) + (2 × 200) is 486. 10 × 486 = 4,860

Pairs | 15 min

Activity 1 The Standard Way

Fluency

Purpose: Students estimate and evaluate three-digit by two-digit multiplication expressions using the standard algorithm to build fluency.

Presentation Screens



Short on time? Consider completing Problems 3 and 6 as a class.

1 Launch



Display the partial products strategy and the standard algorithm strategy.

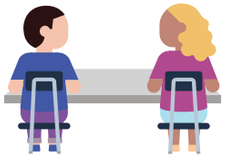
Use the Think-Pair-Share routine. Ask:

- "What is similar about the strategies?"
- "What is different about the strategies?"

Say, "Today, you will evaluate three-digit by two-digit multiplication expressions using the standard algorithm. Work with your partner to complete Problems 1–4. Join another pair to discuss Problem 5."

EB **Emergent Bilinguals** Encourage pairs to explain to their partner how they will evaluate and record each step in the standard algorithm. ELPS 1.E, 2.B, 2.D, 2.F

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 will you set up the problem to evaluate it?"
- Ask, "Which digits should you multiply first?"

3 Connect



Invite students to share their responses to Problem 1.

MLR **MLR8: Discussion Supports — Active Listening** ELPS 1.E, 2.F

Invite students to begin partner interactions by restating their partner's description, in their own words, before adding their own ideas to the discussion. Encourage them to use vocabulary terms, such as *factor*, and high-frequency words, such as *estimate* and *organize*.

Use the Think-Pair-Share routine. Ask:

- "How did the standard algorithm help you keep track of your work?"
- "How did you organize the regrouped values? Why does that make sense?"
- "How might you organize your work if you had to regroup every time?"

Key Takeaway: Say, "The standard algorithm is useful when evaluating multi-digit multiplication expressions because no matter how many digits there are in the factors, the steps to evaluate remain the same. Estimating before evaluating helps you to check your work during each step of the algorithm."

Unit 3 Lesson 5

Name _____ Date _____

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

Multiplication Mayhem

Let's multiply using the standard algorithm.



Warm-Up eyes on teacher

We are a math community. What does it mean to work together in math class?

Activity 1 The Standard Way

Estimate each product and write an equation. Then evaluate the expression using the standard algorithm.

Show your thinking. Sample equations and work shown.

1 875 × 13

estimate equation: 900 × 10 = 9,000

```
  21
 875
×  13
2,625
+ 8,750
11,375
```

answer: 11,375

2 26 × 434

estimate equation: 30 × 400 = 12,000

```
 222
 434
×  26
2,604
+ 8,680
11,284
```

answer: 11,284

Name _____ Date _____

The Standard Way (continued)

Show your thinking. Sample equations and work shown.

3 102 × 93

estimate equation: 100 × 90 = 9,000

```
  1
102
× 93
306
+ 9,180
9,486
```

answer: 9,486

4 223 × 62

estimate equation: 200 × 60 = 12,000

```
 111
223
× 62
446
+ 13,380
13,826
```

answer: 13,826

5 Discuss

- How did you organize your work using the standard algorithm?
- How did you use estimation to check that your work was reasonable as you solved?

Oral activity: No writing expected. Sample response shown.

I organized my work by showing the multiplication of the first factor by the ones place of the second factor. Then I showed the multiplication of the first factor by the tens place of the second factor. When multiplying, I organized the regrouped values above each place value. To check my work, I made sure it was close to my estimate.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Multiply each digit in the second factor as ones.	21 875 × 13 2625 + 875 3,500	**Support** Ask, "What is the value of the 1 in the factor 13? How could you represent this in your work?"
Almost there Multiply each digit in the second factor according to its place value and record regrouped values within the product.	875 × 13 242115 + 8750	**Support** Say, "The standard algorithm helps you organize your work by place value. When the product of 2 factors creates a regrouped value, you record it above the next place value."
Multiply each digit in the second factor and record regrouped values according to their place value.	21 875 × 13 2,625 + 8,750 11,375	**Stretch** Ask, "How might you organize your work if you had to regroup in the tens place of the second factor?"

Pairs | 20 min

Activity 2 Regrouping Everywhere

Fluency

Purpose: Students use their understanding of place value and the standard algorithm to evaluate three-digit by two-digit multiplication expressions in which regrouping is necessary for both places of the second factor.

Presentation Screens



Materials

Lesson Resources:

- Provide students with access to the *Standard Algorithm: Place Value Template* PDF (as needed).

1 Launch



Read aloud the introduction. ELPS 1.E

Say, "You will complete Problems 6 and 7 independently. Then complete Problem 8 with your partner."

Say, "Let's look at Problem 9 together."

Use the Think-Pair-Share routine. Ask, "What are some digits you might choose to use in your expression? Why?"

Say, "Complete Problems 9–11 with your partner."

A **Accessibility: Conceptual processing** Provide access to the *Standard Algorithm: Place Value Template* PDF as students complete Problems 7 and 9.

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, "Which digits should you multiply first?"
- Ask, "Which 2 digits when multiplied will require you to regroup? How do you know?"

EB **Emergent Bilinguals** As students respond to the Discuss prompts, monitor their responses for increasing specificity, such as stating the digits they used, and increasing detail, such as describing how they determined the final product. ELPS 3.E

3 Connect



Invite students to share their responses to Problem 7. Encourage them to share connections between the products of each pair of digits they multiplied and the value of each digit they recorded.

Use the Think-Pair-Share routine. Invite students to speak using informal language and monitor their responses for increasing accuracy and fluency. Ask: ELPS 2.D

- "How did you keep track of multiple regrouped values in Problem 7?"
- "How can you use known multiplication facts to predict the number of places you will need to record regrouped values?"
- "Why might it be helpful to consider where regrouping will be necessary before evaluating a multiplication expression?"

Key Takeaway: Say, "When using the standard algorithm, regrouping may be necessary in multiple places. You can keep track of the regrouped values by recording them using your place value understanding."

Student Edition

Activity 2 Name _____ Date _____

Regrouping Everywhere

Andrea wonders how many ounces of modeling clay it would take to create a new walkway of square tiles from the school to the community garden. She guesses it would take 59 ounces of clay to make 1 square tile. She guesses that 647 square tiles would be needed to make the walkway.

6 About how many ounces of clay would Andrea need to make all of the square tiles for a new walkway? How do you know?

Sample response shown.

About 36,000 ounces of clay because I rounded 59 to 60 and 647 to 600 and 60 × 600 = 36,000.

7 Use the standard algorithm to determine how many inches of clay Andrea would need to make a new walkway. Sample work shown.

Show your thinking.

```
   3 2 3
   5 4 6
     6 4 7
×      5 9
   5 8 2 3
+ 3 2,3 5 0
  3 8,1 7 3
```

answer: 38,173 ounces of clay

8 Discuss Oral activity: No writing expected.

- Where do you see the product of each pair of digits you multiplied?
- Choose 1 regrouped value. What is the value? How do you know?
- How did you use the regrouped values to determine the final product?

Activity 2 Name _____ Date _____

Regrouping Everywhere (continued)

9 Write a multiplication expression for your partner to evaluate. There must be:

- 2 factors.
- 1 factor with 3 digits and 1 factor with 2 digits.
- Regrouping in at least 2 places.

Sample responses shown for Problems 9 and 10.

my expression: 877 × 65 estimate: 900 × 70 = 63,000

my partner's expression: 596 × 74 estimate: 600 × 70 = 42,000

10 Evaluate your expression and your partner's expression from Problem 9 using the standard algorithm.

Show your thinking.

My expression

```
   5 4 4
   4 3 3
     8 7 7
×      6 5
   4,3 8 5
+ 5 2,6 2 0
  5 7,0 0 5
```

answer: 57,005

My partner's expression

```
   4 6 4
   2 3 2
     5 9 6
×      7 4
   2,3 8 4
+ 4 1,7 2 0
  4 4,1 0 4
```

answer: 44,104

11 Discuss Oral activity: No writing expected.

- Which digits did you use to write your multiplication expressions? Why?
- How did you record any regrouped values? What is their value?

Presentation Screens

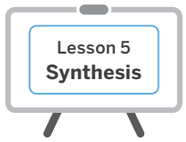
D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Explain their thinking using known facts.	I multiplied 9 × 7, and recorded 6 and 3. I multiplied 9 × 4, and recorded 3 and 6. I multiplied 9 × 6 and recorded 5 and 4.	S **Strengthen** Ask, "What is the value of each digit that you recorded? How do you know?"
Explain their thinking using place value understanding.	• 9 × 7 is 63, so I recorded the 3 in the ones place and the 6 in the tens place. • 9 × 4 tens is 36 tens, so I recorded the 6 in the tens place and the 3 in the hundreds place. • 9 × 6 hundreds is 54 hundreds, so I recorded the 4 in the hundreds place and the 5 in the thousands place.	S **Stretch** Ask, "How would your thinking stay the same or change if the second factor was 359?"

Whole Class | 10 min

Synthesis

Presentation Screens



Lesson Takeaway: Using the standard algorithm to solve multi-digit multiplication problems helps to organize all of the partial products and regrouped values in an efficient way. Estimating before solving is helpful in monitoring work and checking that the place value of each partial product is accurate.



Use the Think-Pair-Share routine. Invite students to reflect on everything they have learned about multiplication and to use the sentence frames to structure their reflection.

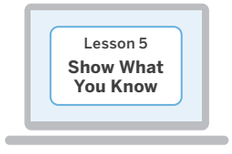
Say, "In this sub-unit, you built on familiar strategies and representations of multiplication to multiply greater multi-digit numbers, and you expanded your representations to include the standard algorithm. In future lessons, remember that you can choose a strategy based on what is most efficient for you. No matter which strategy you choose, it is important to attend to precision and place value."

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

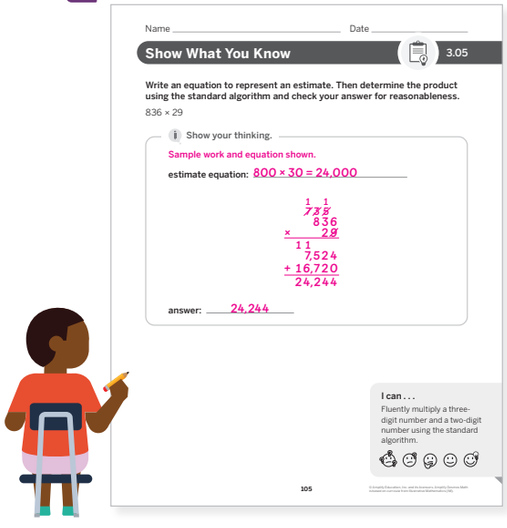
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.05

Write an equation to represent an estimate. Then determine the product using the standard algorithm and check your answer for reasonableness.

836 × 29

Show your thinking.

Sample work and equation shown.

estimate equation: 800 × 30 = 24,000

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 836 \\ \times\ \ 29 \\ \hline 7,524 \\ +\ 16,720 \\ \hline 24,244 \end{array}$$

answer: 24,244

I can . . .
Fluently multiply a three-digit number and a two-digit number using the standard algorithm.

105

Today's Goals

1. **Goal:** Fluently multiply a three-digit number by a two-digit number using the standard algorithm.
   - In the *Show What You Know*, students multiplied a three-digit by two-digit number using the standard algorithm.
2. **Language Goal:** Explain how the standard algorithm can be used to attend to the place value of regrouped values. **(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 5
Practice

Students using digital

Students using print

Summary 3.05

Using the standard algorithm to solve multi-digit multiplication problems helps to organize all of the partial products and regrouped values in an efficient way. Estimating before solving is helpful in monitoring work and checking that the place value of each partial product is accurate.

Estimation	Standard algorithm
300 × 10 = 3,000	32 ← regrouped values 295 × 14 1,180 ← partial products + 2,950 ← 4,130

Practice 3.05

1 Determine the product of the expression 477 × 53 using the standard algorithm.

Record your answer in the space provided.

25,281

Grade 5 Unit 3 Lesson 5 211 Summary | Practice

Practice 3.05

Name _____ Date _____

For Problems 2 and 3, estimate the product and write an equation. Then determine the product using the standard algorithm.

Show your thinking. Sample equations and work shown.

2

estimate equation: 300 × 40 = 12,000

1
13
325
× 36
1,950
+ 9,750
11,700

answer: 11,700

3

estimate equation: 500 × 70 = 35,000

25
37
549
× 68
4,392
+ 32,940
37,332

answer: 37,332

4 1 bag of red wiggler worms, which are used for composting, is sold for $44. A sustainable farm purchases 125 bags of worms. Estimate the product and write an equation. Then determine the total cost of the worms.

Show your thinking. Sample equation and work shown.

estimate equation: 130 × 40 = 5,200

12
12
125
× 44
500
+ 5,000
5,500

answer: $5,500

Grade 5 Unit 3 Lesson 5 212 Practice

Practice 3.05

Name _____ Date _____

5 Diego evaluated the expression 727 × 42. His work is partially shown. Help Diego by completing his work and determining the product.

30,534

Diego's work

12
1 1
727
× 42
1,454
+ 29,080
30,534

Spiral Review

6 Simplify the expression 123(15) ÷ (5.56 + 3.44).

Show your thinking. Sample work shown.

11
123
× 15
615
+ 1230
1,845

11
5.56
+ 3.44
9.00

205
9)1845
−18
045
− 45
0

answer: 205

For Problems 7 and 8, determine the value of the expression.

7 6,720 ÷ 6

1120
6)6720
−6
07
− 6
12
− 12
00

answer: 1,120

8 6,318 ÷ 9

702
9)6318
−63
001
− 0
18
− 18
00

answer: 702

Grade 5 Unit 3 Lesson 5 213 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	1	5.3.B
Fluency	2–4	1	5.3.A, 5.3.B
Fluency	5	2	5.3.A, 5.3.B
Spiral Review			
	6	2	5.4.F
Fluency	7, 8	1	4.4.D

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: Fluently multiply a three-digit number by a two-digit number using the standard algorithm.

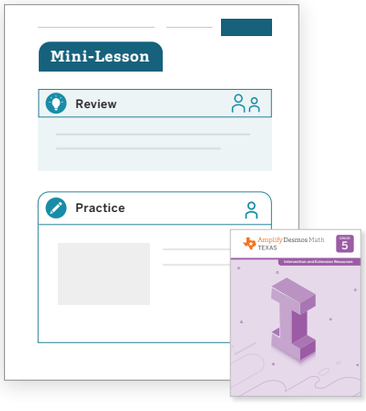
Support

Provide targeted intervention for students by using these resources.

If students evaluate without attending to place value:

Respond:

- Assign the *Multi-Digit Multiplication Fluency* Mini-Lesson. | 15 min
- Review the standard algorithm steps.



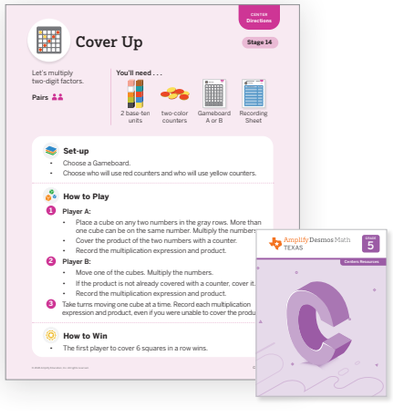
Strengthen

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

If students evaluate using their place value understanding to regroup:

Respond:

- Invite students to play these **Centers**. | 15 min
  Cover Up: Two-Digit Factors
  Equation Challenge:
  - *Two-Digit Factors*
  - *Multi-Digit Factors*
- Have students complete **Lesson 5 Practice**. | 15 min
- **Item Bank**



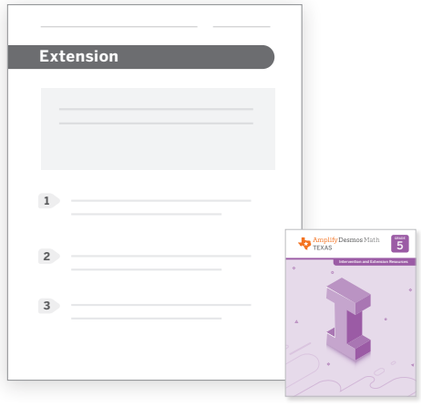
Stretch

Challenge students and extend their learning with these resources.

If students fluently evaluate using their place value understanding to regroup:

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, e.g., *product/el producto*
- Frayer Model templates
- Vocabulary routines





Professional Learning

Reflect on a recent time that your thinking changed about something in class. 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. The *Up Next* problems preview targeted concepts and skills addressed in the next sub-unit.

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

Item Analysis

Problem(s)	Concept or skill	DOK	TEKS
1, 2	Multiplying multi-digit whole numbers fluently using the standard algorithm	1	5.3.B *(S)*
3	Estimating products of multi-digit numbers	2	5.3.A *(S)*
Up Next . . . (preparation for Lesson 6)			
4*	Determining whole number quotients with up to four-digit dividends and one-digit divisors	1	4.4.F *(S)*

* Because this problem addresses prerequisite concepts for the next sub-unit, the Up Next problem is not intended to be part of a student's overall score on this assessment.

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources includes:
- 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 3
Quiz: Sub-Unit 1

Name _____ Date _____

Quiz: Sub-Unit 1

Unit 5.3

For Problems 1 and 2, calculate the product using the standard algorithm.
Sample work shown.

Show your thinking.

1 628 × 25

```
  1
 14
628
 × 25
3,140
+12,560
15,700
```

answer: 15,700

2 359 × 63

```
  35
  12
 359
 ×  63
1,077
+21,540
22,617
```

answer: 22,617

3 A company is ordering custom T-shirts for an event. Each T-shirt costs $17. They plan to order 352 T-shirts. Which of the following is the most reasonable estimate for the total cost?

A. $7,000 B. $3,500
C. $5,984 D. $600

81

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Name _____ Date _____

Quiz: Sub-Unit 1 (continued)

Up Next . . .

4 Determine the quotient 7,518 ÷ 6. **Sample work shown.**

Show your thinking.

	1,200	50	3
6	7,200	300	18

1,200 + 50 + 3 = 1,253

answer: 1,253

82

D Differentiation (Quiz: Sub-Unit 1)

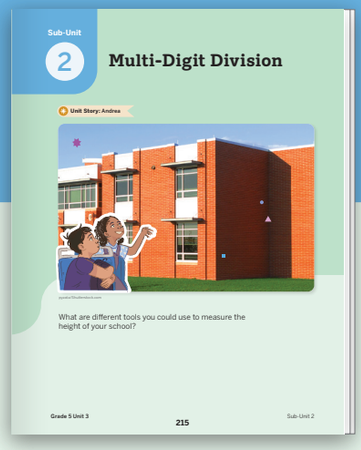
To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goal(s)	Problem(s)	Respond to Student Thinking
Sub-Unit 1: Multiply multi-digit whole numbers using the standard algorithm.	1, 2	**Support** • **Mini-Lesson:** *Multi-Digit Multiplication Fluency* (ML 3.05) • **Teacher Move:** Have students review the problems. Provide another opportunity for students to determine the product of a three-digit number and a two-digit number.
	3	**Support** • **Mini-Lesson:** *Estimating and Finding Products of Multi-Digit Numbers* (ML 3.02)
Up Next . . . (preparation for Lesson 6)		
Sub-Unit 2: Divide multi-digit whole numbers using strategies based on place value and the relationship between multiplication and division.	4	**Support** • **Mini-Lesson:** *Dividing Multi-Digit Numbers Using the Standard Algorithm* (Grade 4 ML 5.14)

Notes:

Sub-Unit 2

Multi-Digit Division



Sub-Unit 2 Goal

- Solve for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Progression of TEKS in Sub-Unit 2

- **Lessons 6–8:** Students determine the reasonable place value of the quotient before using partial quotients strategies to divide a four-digit dividend by a two-digit divisor without remainders. They relate their understanding of partial products strategies to partial quotients strategies.
- **Lessons 9–10:** Students use partial quotients strategies and the standard algorithm to divide a four-digit dividend by a two-digit divisor, with and without remainders. They interpret and rename remainders as mixed numbers.

Sub-Unit 2 Progression	Lesson 6*	Lesson 7	Lesson 8	Lesson 9	Lesson 10
Number and operations					
TEKS 5.3.A	○	●	○	○	○
TEKS 5.3.C	●	●	●	●	●
Algebraic reasoning					
TEKS 5.4.H	●	○	○	●	○

*This lesson builds toward the standard shown.

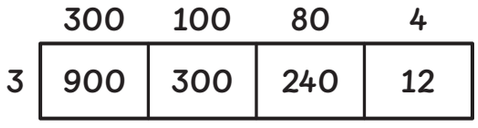
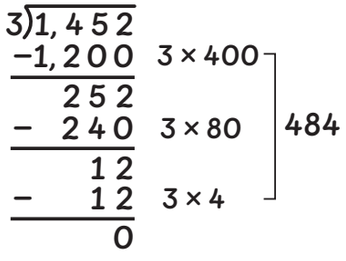
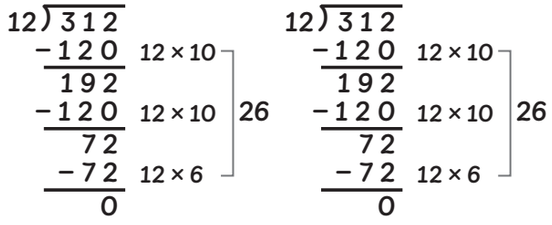
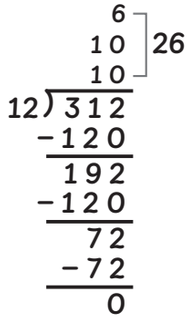
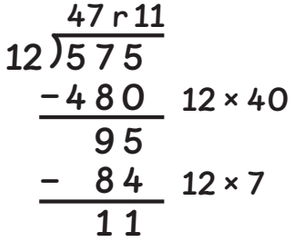
Coming up Next

- **Sub-Unit 3, Lessons 11–13:**
  - » Algebraic reasoning: **TEKS 5.4.B, 5.4.H**
- **Sub-Unit 4, Lessons 14–17:**
  - » Number and operations: **TEKS 5.3.B**
  - » Personal financial literacy: **TEKS 5.10.A, 5.10.B, 5.10.C, 5.10.D, 5.10.E, 5.10.F**

Math That Matters Most

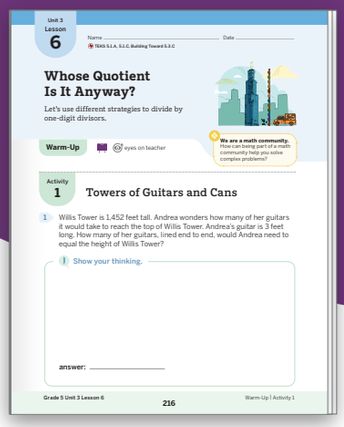
Sub-Unit 2: Divide multi-digit whole numbers with partial quotients, using place value and the relationship between multiplication and division.

Progression of Strategies, Skills, or Language

Progression	For example . . .	
Using place value strategies to divide four-digit dividends by one-digit divisors.		
Using partial quotients strategies to divide up to four-digit dividends by two-digit divisors.		
Using strategies and algorithms to divide four-digit dividends by two-digit divisors resulting in remainders.	Andrea has 575 feet of ribbon. She cuts 12 strips of ribbon to decorate the border of each bulletin board in her school. She makes sure each strip is the same length so that it will exactly fit the perimeter of each board. What is the perimeter of each bulletin board?	

Unit 3
Lesson
6

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


Unit 3 Lesson 6

Whose Quotient Is It Anyway?

Let's use different strategies to divide by one-digit divisors.

Warm-Up

Activity 1 Towers of Guitars and Cans

1 Willis Tower is 1,452 feet tall. Andrea wonders how many of her guitars it would take to reach the top of Willis Tower. Andrea's guitar is 3 feet long. How many of her guitars, lined end to end, would Andrea need to equal the height of Willis Tower?

Show your thinking.

answer: _____

Grade 5 Unit 3 Lesson 6 216 Warm-Up | Activity 1

Whose Quotient Is It Anyway?

Dividing Multi-Digit Dividends by One-Digit Divisors

Let's use different strategies to divide by one-digit divisors.

Key Concepts

Today's Goals

1. **Goal:** Divide multi-digit dividends by one-digit divisors using familiar strategies and interpretations.
2. **Goal:** Use estimation to reason about the place value of the quotient and identify dividends given the place value of the quotient.
3. **Language Goal:** Explain what the dividend, divisor, and quotient represent in a story problem. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use their work with division from Grade 4 to divide multi-digit dividends by one-digit divisors without remainders. They revisit the 2 interpretations of division and use their understanding of place value to estimate the size of quotients and create dividends that result in quotients in certain place values. Estimation plays a crucial role throughout this sub-unit, helping students ground their understanding of division strategies in place value and continue to develop their understanding of reasonableness. **(TEKS 5.1.A, 5.1.C)**

Prior Learning

In Grade 4, students used partial quotients and the standard algorithm to divide up to four-digit dividends by one-digit divisors. In Sub-Unit 1, students developed fluency with multiplying multi-digit whole numbers, including using the standard algorithm.

Future Learning

In Lesson 7, students will continue to build their understanding of the connection between place value and division strategies as they divide three-digit and four-digit dividends by two-digit divisors using partial quotients.

Integrating Rigor in Student Thinking

- Students use familiar strategies to build their **conceptual understanding** of multi-digit division and connect place value understanding to division strategies.

Vocabulary

Review Vocabulary

dividend

divisor

partial quotients

quotient

TEKS

Building Toward

5.3.C

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Math Process Standards: 5.1.A, 5.1.C, 5.1.D

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

Building On

4.4.E

4.4.F

Building Math Identity

We are a math community.
How can being part of a math community help you solve complex problems?

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

Lesson at a Glance

60 min

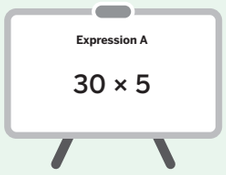
TEKS: 5.1.A, 5.1.C, 5.1.D, Building Toward 5.3.C

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 involving related multiples of 10. **(TEKS 5.1.D)**

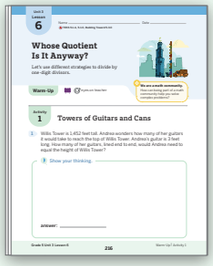


Activity 1

Pairs | 20 min

Students solve 2 real-world division problems that use the same values but represent the 2 different interpretations of division. As they share and compare their work, students reinforce their understanding that the same strategies can be used no matter the type of division.

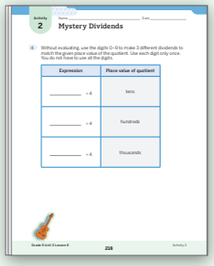
Manipulative Kit: base-ten blocks (as needed)



Activity 2

Pairs | 15 min

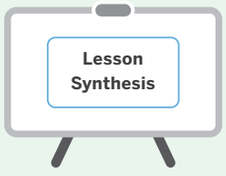
Students continue to develop their understanding of place value and estimation with division as they create dividends that result in quotients in given place values. They see that they can use place value and known multiplication facts to reason about quotients.



Synthesis

Whole Class | 10 min

Students review and reflect on how to estimate and compare the relative size of quotients without evaluating.

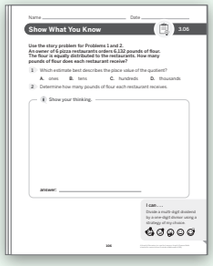


Show What You Know

Independent | 5 min

Students demonstrate their understanding of multi-digit division by dividing a four-digit dividend by a one-digit divisor using a division strategy of their choice.

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

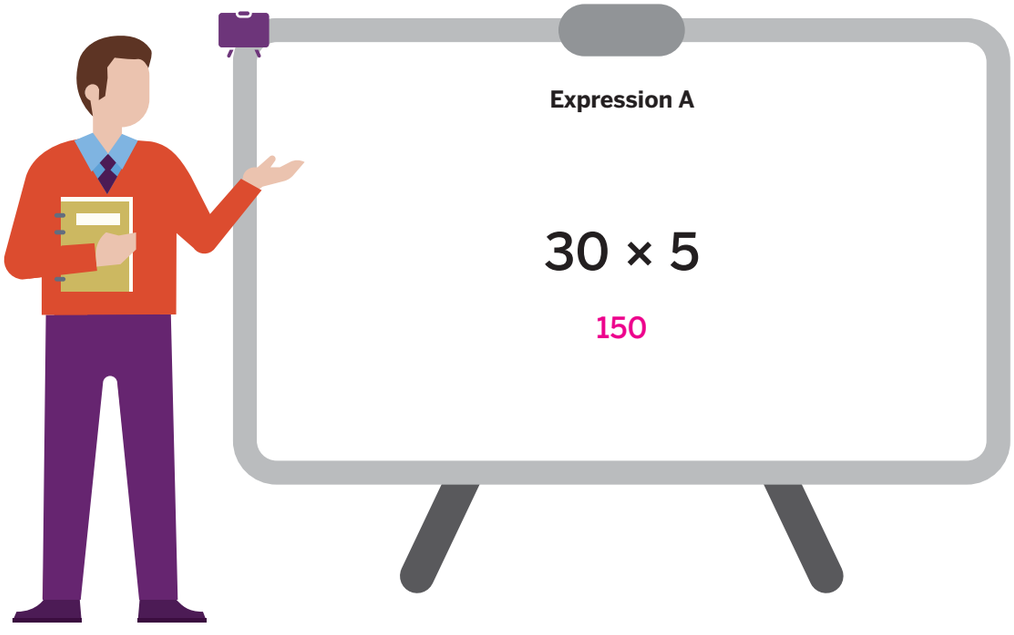
Presentation Screens



Warm-Up Number Talk

Fluency

Purpose: Students multiply multiples of 10, 100, and 1,000 by 5, preparing them to determine partial quotients when dividing by a one-digit divisor in Activity 1.



Expression B

300 × 5

1,500

Expression C

3,000 × 5

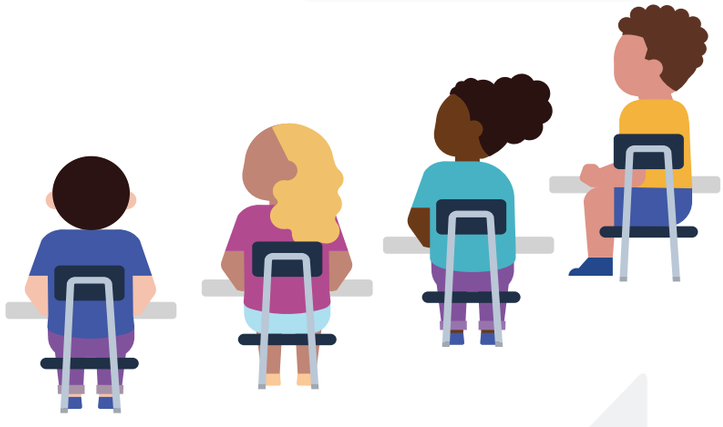
15,000

Expression D

3,330 × 5

16,650

Why these problems? These expressions lend themselves to using related expressions and place value to prepare for determining partial quotients.



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 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 Expression D.

Ask (if not yet mentioned during discussion):

- "How could you use Expressions A–C to help you evaluate Expression D?"
- "How are these expressions helpful when thinking about dividing 16,650 by 5?"

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

A: *150. I can think of 30 as 3 × 10, and I know that 3 × 5 = 15 and 15 × 10 = 150.*

B: *1,500. I can think of this as 150 × 10.*

C: *15,000. The product will be 10 times as much as the product of Expression B.*

D: *16,650. 3,330 is the sum of the first factor in Expressions A, B, and C, so the product is the sum of the products of those expressions.*

Pairs | 20 min

Activity 1 Towers of Guitars and Cans

Purpose: Students use their prior knowledge of division strategies to evaluate a division expression in which a four-digit dividend is divided by a one-digit divisor with no remainder.

Presentation Screens



Materials

Manipulative Kit:

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

Short on time? Consider having students complete Problem 1 in pairs and then discuss how Problem 2 is similar to and different from Problem 1 as a class.

1 Launch



Read aloud Problems 1 and 2. ELPS 1.E

Use the Think-Pair-Share routine. Ask, "For each problem, will the answer be greater than or less than 1,452? Why?"

Say, "Choose which partner will complete Problem 1 and which partner will complete Problem 2. Then complete Problem 3 together."

A **Accessibility: Visual-spatial processing** Provide access to base-ten blocks to support students' reasoning with a concrete representation of division. Guide visualization by having students begin by modeling the dividend in Problem 1 and drawing a corresponding area model.

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, "What strategies have you used before to divide? How could you use those strategies here?"

3 Connect



Invite students to share their responses to the first bullet in Problem 3.

Record students' thinking by annotating the equation.

Invite students to share different strategies they used to divide for Problem 1 or Problem 2, such as an area model and partial quotients strategies. Record students' strategies as they share.

Ask, "How are the strategies similar? How are they different?"

Key Takeaway: Say, "As you have seen before, the quotient of a division expression can represent the number of equal shares or the number of groups of the divisor in the dividend. You can divide using different partial quotients strategies."

Student Edition

Unit 3
Lesson
6

Name _____ Date _____

TEKS 5.1.A, 5.1.C, Building Toward 5.3.C

Whose Quotient Is It Anyway?

Let's use different strategies to divide by one-digit divisors.



Warm-Up eyes on teacher

We are a math community. How can being part of a math community help you solve complex problems?

Activity
1

Towers of Guitars and Cans

1 Willis Tower is 1,452 feet tall. Andrea wonders how many of her guitars it would take to reach the top of Willis Tower. Andrea's guitar is 3 feet long. How many of her guitars, lined end to end, would Andrea need to equal the height of Willis Tower? **Sample work shown.**

Show your thinking.

300 + 100 + 80 + 4 = 484

	300	100	80	4
3	900	300	240	12

answer: 484 guitars

Activity
1

Name _____ Date _____

Towers of Guitars and Cans (continued)

2 Andrea made $1,452 in 3 months recycling cans from her neighborhood. She made the same amount of money each month. How much money did Andrea make each month recycling cans? **Sample work shown.**

Show your thinking.

$$\begin{array}{r} 484 \\ 3\overline{)1,452} \\ -12\downarrow \\ \hline 25 \\ -24\downarrow \\ \hline 012 \\ -12 \\ \hline 0 \end{array}$$

answer: $484

3 Discuss Oral activity: No writing expected.

- What does the divisor represent in Problems 1 and 2? The quotient?
- How is your work in Problems 1 and 2 similar? Different?

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Draw an area model with multiple hundreds, multiple tens, and multiple ones.	3 | 300 | 300 | 300 | 300 | 150 | 90 | 6 | 6 100 + 100 + 100 + 100 + 50 + 30 + 2 + 2 = 484	**Strengthen** Ask, "How else could you represent your partial quotients?"
Use a partial quotients strategy with multiple hundreds.	$3\overline{)1,452}$ −600 (3 × 200) 852 −600 (3 × 200) 252 −240 (3 × 80) 12 −12 (3 × 4) 0 484	**Stretch** Ask, "How would your partial quotients change if the divisor was 13?"
Use a partial quotients strategy with 1 partial quotient for each place value.	$3\overline{)1,452}$ −1,200 (3 × 400) 252 −240 (3 × 80) 12 −12 (3 × 4) 0 484	

Pairs | 15 min

Presentation Screens



Activity 2 Mystery Dividends

Purpose: Students write division expressions with a given divisor that yield quotients in the tens, hundreds, and thousands places. This prepares them to form reasonable estimates of quotients in the upcoming lessons.

1 Launch



Say, "Here is the equation from Activity 1."

Ask, "What is the place value of the dividend? What is the place value of the quotient?"

Read aloud Problem 4.

Say, "Complete Problem 4 with your partner. Then you will join another pair to complete Problem 5."

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 language backgrounds. ELPS 1.E, 2.C, 2.D

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, "To make a quotient in the tens place, how many digits do you think should be in your dividend?"
- Ask, "What is 4 ÷ 4? What is 40 ÷ 4? What do you notice about the size of the quotient when you increase the value of the dividend?"

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

- As students complete Problems 4 and 5, listen for language that highlights an understanding of division and place value. For example, "A dividend in the thousands place divided by a one-digit divisor makes a quotient in the thousands place."
- Record students' language and keep it displayed for the rest of the activity. Encourage students to use the language as they explain their thinking in the Connect.

3 Connect



Invite pairs to share how they reasoned about the dividends in Problem 4. Encourage students to use the language from the class display.

Record different examples of dividends for each row as students share.

Ask, "How can you use the same reasoning to estimate the size of any quotient?"

Key Takeaway: Say, "You can use place value understanding and known facts to determine whether a quotient will be in the tens, hundreds, or thousands place."

Activity 2

Name _____ Date _____

Mystery Dividends

4 Without evaluating, use the digits 0–9 to make 3 different dividends to match the given place value of the quotient. Use each digit only once. You do not have to use all the digits. **Sample response shown.**

Expression	Place value of quotient
67 ÷ 4	tens
425 ÷ 4	hundreds
8,039 ÷ 4	thousands



Activity 2

Name _____ Date _____

Mystery Dividends (continued)

5 **Discuss**

Share your work with another pair.

- How did you determine each dividend?
- Compare your expressions in the first row of the table. Whose expression has a greater number of tens in the quotient? How do you know?

Oral activity: No writing expected. Sample response shown.

- *I chose a dividend that was in the same place value as the quotient. Then I picked a digit to write in the greatest place value that is greater than 4. So, for a quotient in the tens place, I chose 67 because 67 is in the tens place and 6 is greater than 4.*
- *Our expression is 67 ÷ 4 and the other pair's expression is 93 ÷ 4. Our quotient is greater than 10 but theirs is greater than 20, so 93 ÷ 4 has more tens.*



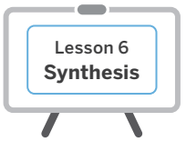
Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Explain with some place value language.	*I needed a number in the tens.*	**Support** Ask, "What do you mean by *number*? How did you know the number needs to be in the tens place?"
Almost there Explain using place value language.	*I matched the place value of the quotient with the place value of the dividend I needed to create.*	**Support** Ask, "Would *any* digit in the same place value of the quotient work? Why or why not?"
Explain using place value language and the size of the divisor.	*The dividend needed to have a digit that is 4 or greater in the same place value as the quotient because the divisor is 4.*	**Stretch** Ask, "Does the place value of the quotient always have to match the place value of the dividend? Why or why not?"
Explain using known multiplication facts or multiples of 4 and key mathematical terminology.	*To make a quotient in the thousands place, I needed a dividend with 4 digits. I made the digit in the thousands place 8 because 8 is a multiple of 4 and 4 × 2,000 is 8,000.*	

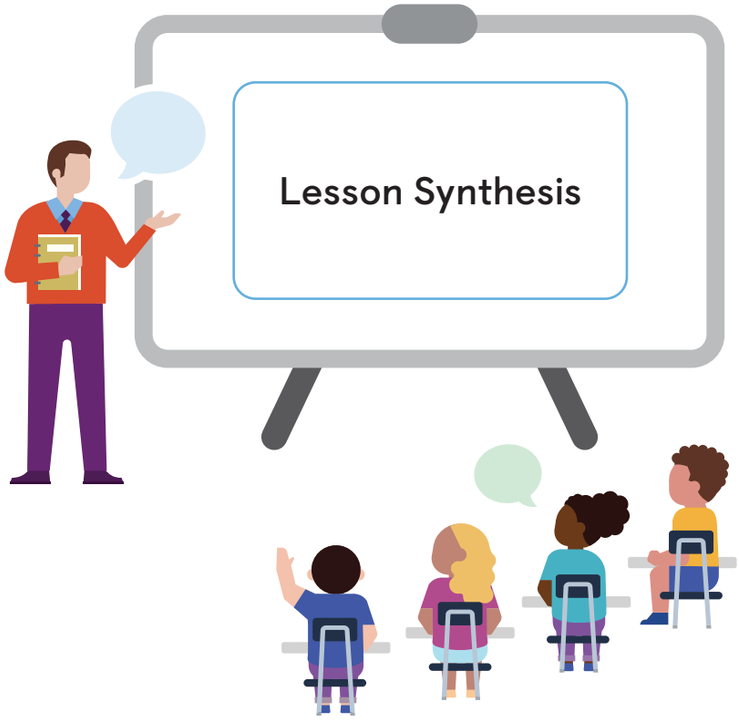
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: A divisor can be interpreted as the number of groups or the size of each group. Known facts and place value understanding can help when estimating the relative size of a quotient.



Ask:

- "What is the place value of the quotient in each expression? How do you know?"
- "Without evaluating, which quotient is greater? How do you know?"

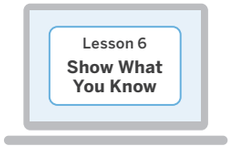
Say, "In the coming lessons, you will see that you can use the same place value understanding to reason about quotients and divide when you have a two-digit divisor."

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

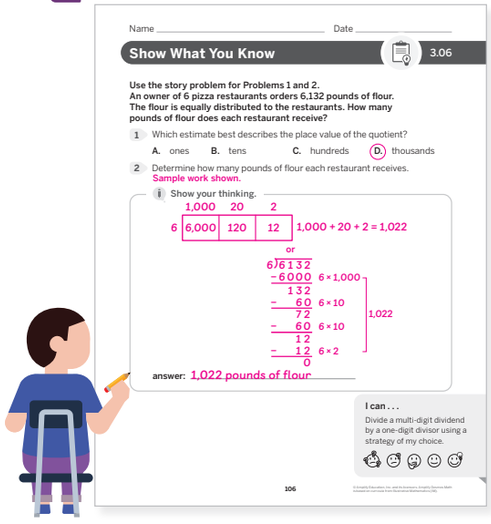
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.06

Use the story problem for Problems 1 and 2.
An owner of 6 pizza restaurants orders 6,132 pounds of flour. The flour is equally distributed to the restaurants. How many pounds of flour does each restaurant receive?

1 Which estimate best describes the place value of the quotient?

A. ones B. tens C. hundreds (D.) thousands

2 Determine how many pounds of flour each restaurant receives.
Sample work shown.

Show your thinking.

1,000 20 2
6 | 6,000 | 120 | 12 | 1,000 + 20 + 2 = 1,022

or

6)6132
−6000 6 × 1,000
132
− 60 6 × 10
72
− 60 6 × 10
12
− 12 6 × 2
0
1,022

answer: 1,022 pounds of flour

I can . . .
Divide a multi-digit dividend by a one-digit divisor using a strategy of my choice.

106

Today's Goals

1. **Goal:** Divide multi-digit dividends by one-digit divisors using familiar strategies and interpretations.
   - In Problem 2 in the *Show What You Know*, students divided a four-digit dividend by a one-digit divisor.
2. **Goal:** Use estimation to reason about the place value of the quotient and identify dividends given the place value of the quotient.
   - In Problem 1 in the *Show What You Know*, students estimated the place value of the quotient.
3. **Language Goal:** Explain what the dividend, divisor, and quotient represent in a story problem. **(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 6
Practice

Students using digital

Students using print

Summary 3.06

When dividing, you can interpret the divisor as the number of groups or the size of each group. Using known facts and place value understanding can help you determine whether the quotient is greater than 1, 10, 100, or 1,000.

$2{,}555 \div 5 = 511$

dividend ÷ divisor = quotient

The quotient is greater than 100 but less than 1,000 because $5 \times 100 = 500$ and $5 \times 1000 = 5{,}000$.

	500	11
5	2,500	55

$5 \times 500 = 2{,}500$
$5 \times 11 = 55$
$5 \times 511 = 2{,}555$

$5\overline{)2555}$
-2500 5×500
55
-50 5×10
5
-5 5×1
0
511

Practice 3.06

1 Evaluate the expression $628 \div 4$. **Sample work shown.**

Show or explain your thinking.

150	7
600	28

$150 + 7 = 157$

answer: 157

Grade 5 Unit 3 Lesson 6 220 Summary | Practice

Practice 3.06

Name _____ Date _____

For Problems 2 and 3, evaluate the expression. **Sample work shown.**

Show your thinking.

2 $792 \div 8$

90	9
720	72

$8 \times 90 = 720$
$8 \times 9 = 72$
$720 + 72 = 792$

answer: 99

3 $972 \div 6$

$6\overline{)972}$
-600 6×100
372
-360 6×60
12
-12 6×2
0
162

answer: 162

Grade 5 Unit 3 Lesson 6 221 Practice

Practice 3.06

Name _____ Date _____

4 What is the quotient $392 \div 7$? **Sample work shown.**

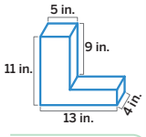
(A) 54 (B) 50 (C) 56 (D) 55

Show your thinking.

$7\overline{)392}$
-350 7×50
42
-42 7×6
0
56

Spiral Review

5 Determine the volume of the figure.



Record your answer in the space provided.

284 cubic inches

For Problems 6–9, determine the value of the expression.

6 60×40 2,400

7 70×90 6,300

8 40×70 2,800

9 50×50 2,500

Grade 5 Unit 3 Lesson 6 222 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–4	2	5.3.C*
Spiral Review			
Test Practice	5	2	5.4.H
Fluency	6–9	1	4.4.D

*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 6

Lesson Goal: Divide multi-digit dividends by one-digit divisors using familiar strategies and interpretations.

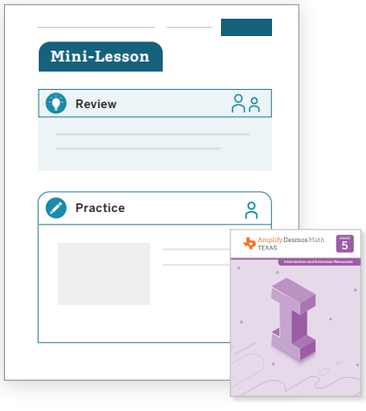
Support

Provide targeted intervention for students by using these resources.

If students draw an area model and repeatedly use tens and ones as their partial quotients:

Respond:

- Assign the *Dividing Multi-Digit Dividends by One-Digit Divisors Without Remainders* 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.



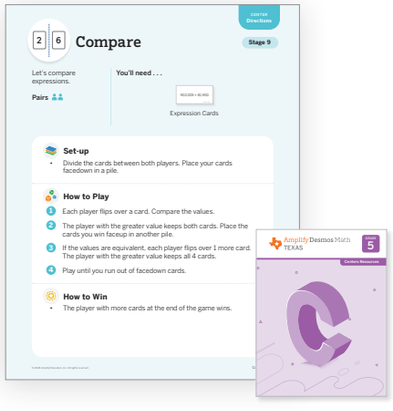
Strengthen

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

If students use a partial quotients strategy with multiple hundreds, multiple tens, and multiple ones:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
- Have students complete **Lesson 6 Practice**. | 15 min
- **Item Bank**



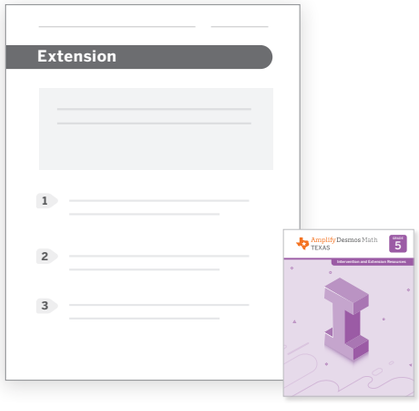
Stretch

Challenge students and extend their learning with these resources.

If students use a partial quotients strategy with 1 partial quotient for each place value:

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, e.g., *dividend/dividendo*
- Frayer Model templates
- Vocabulary routines

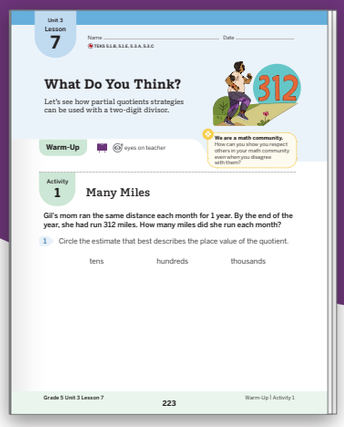


Professional Learning

What student work would you highlight if you taught this lesson again?

Unit 3
Lesson
7

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



What Do You Think?

Dividing Three- and Four-Digit Dividends by Two-Digit Divisors

Let's see how partial quotients strategies can be used with a two-digit divisor.

Key Concepts

Today's Goals

1. **Goal:** Divide a three- or four-digit dividend by a two-digit divisor, without remainders, starting with multiples of 10.
2. **Goal:** Use estimation to reason about the place value of the quotient.
3. **Language Goal:** Explain how to determine partial quotients with a two-digit divisor. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students build upon their work from Lesson 6 to divide three- and four-digit dividends by two-digit divisors, resulting in quotients in the tens place without remainders. They consider the reasonableness of their answers and use their place value understanding to see that they can apply the same partial quotients strategies and representations to divide with two-digit divisors as they did with one-digit divisors. **(TEKS 5.1.B, 5.1.E)**

Prior Learning

In Lesson 6, students used place value to estimate the size of quotients and place-value based strategies to divide multi-digit dividends by one-digit divisors.

Future Learning

In Lesson 8, students will use partial quotients strategies to divide four-digit dividends by two-digit divisors, resulting in quotients in the hundreds place without remainders. They will consider different ways to form partial quotients.

Integrating Rigor in Student Thinking

- Students continue to build their **conceptual understanding** of division with multi-digit numbers as they use place value understanding and partial quotients to divide three- and four-digit dividends by two-digit divisors.

Vocabulary

Review Vocabulary

dividend

divisor

partial quotients

quotient

TEKS

Addressing

5.3.C

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Also Addressing: 5.3.A

Math Process Standards: 5.1.B, 5.1.E

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

Building On	Building Toward
4.4.F	**6.3.E**

Building Math Identity

We are a math community.
How can you show you respect others in your math community even when you disagree with them?

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

Lesson at a Glance

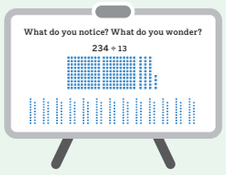
60 min

TEKS: 5.1.B, 5.1.E, 5.3.A, 5.3.C

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about dividing a three-digit dividend by a two-digit divisor using base-ten blocks.



Activity 1 Fluency

Pairs | 15 min

Students use partial quotients to solve a real-world problem in which they divide a three-digit dividend by a two-digit divisor. They see that they can use the place value of the dividend to choose their first partial quotient, just like when dividing by a one-digit divisor.



Activity 2 Fluency

Pairs | 20 min

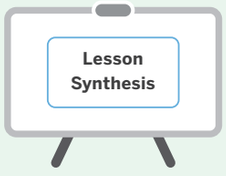
Students practice dividing three-digit and four-digit dividends by two-digit divisors. They recognize that different partial quotients result in the same final quotient.



Synthesis

Whole Class | 10 min

Students review and reflect on different ways to write partial quotients when dividing by a two-digit divisor.

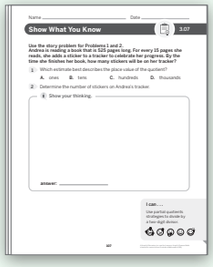


Show What You Know

Independent | 5 min

Students demonstrate their understanding of partial quotients by dividing a three-digit dividend by a two-digit divisor.

Materials: *Show What You Know* PDF



Math Language Development

Emergent Bilinguals

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



- ✓ Manipulatives
- ✓ Visuals
- ✓ Frayer Model
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F, 3.C, 3.E, 3.F, 3.G, 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** 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.

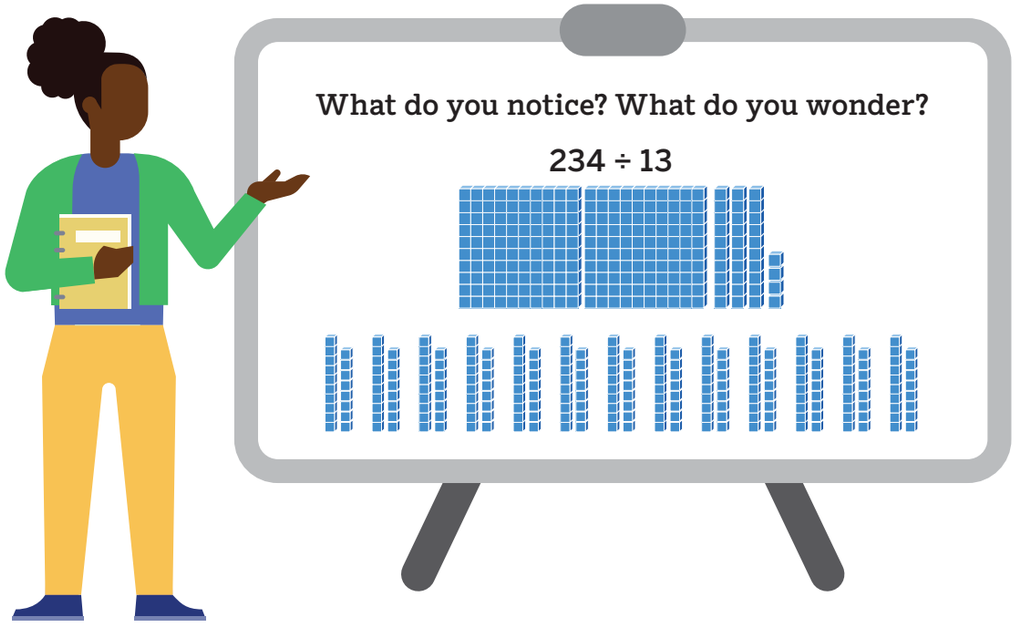
Whole Class | 10 min

Presentation Screens



Warm-Up Notice and Wonder

Purpose: Students examine an image showing division with a two-digit divisor using base-ten blocks. This prepares them for using partial quotients strategies to divide by two-digit divisors.





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.

Play the animation. ELPS 1.F

Ask (if not yet mentioned during discussion), "How is the divisor represented in each model?"

Students might say . . . ELPS 2.B

I notice that it shows division as distributing 234 into 13 equal groups.

I notice that a lot of exchanging would be needed, like exchanging 1 hundred for 10 tens, to distribute the tens equally.

I wonder when I would use base-ten blocks to divide numbers like this.

I wonder how I could use partial quotients strategies to divide with numbers like this.

Pairs | 15 min

Presentation Screens



Activity 1 Many Miles

Fluency

Purpose: Students use partial quotients strategies to solve a story problem involving a three-digit dividend and a two-digit divisor.

1 Launch



MLR **MLR6: Three Reads** ELPS 1.E, 2.F, 3.A, 3.C, 3.F, 3.G, 3.H

Read the story problem aloud 3 times. Demostrate the directionality of reading by reading the text top to bottom and left to right, pointing to the words as you read them. Invite students to follow along.

- **Read 1:** Say, "Tell your partner what happened in the story without using any numbers." Monitor for the use of high-frequency words, such as *distance*, *same*, *month*, and *year*.
- **Read 2:** Ask, "What information is missing that you need to solve the problem?"
- **Read 3:** Ask, "What does 312 represent? What does 12 represent? What will the answer represent?"

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

A **Accessibility: Memory and attention** Display or provide students with access to the division strategies from Lesson 6 for them to reference while completing Problem 2.

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 is 10 × 12? 100 × 12? What does that tell you about the place value of the quotient?"

3 Connect



Invite students to share how they solved Problem 2.

Record students' responses as they share.

Ask, "How did estimating the place value of the quotient before evaluating help you choose your first partial quotient?"

Key Takeaway: Say, "When using partial quotient strategies to divide multi-digit numbers, it can be helpful to consider what the place value of the quotient will be before evaluating."

Student Edition

Unit 3
Lesson 7

Name _____ Date _____

TEKS 5.1.B, 5.1.E, 5.3.A, 5.3.C

What Do You Think?

Let's see how partial quotients strategies can be used with a two-digit divisor.



Warm-Up eyes on teacher

We are a math community. How can you show you respect others in your math community even when you disagree with them?

Activity 1

Many Miles

Gil's mom ran the same distance each month for 1 year. By the end of the year, she had run 312 miles. How many miles did she run each month?

1 Circle the estimate that best describes the place value of the quotient.

(tens) hundreds thousands

Activity 1

Name _____ Date _____

Many Miles (continued)

2 Determine how many miles Gil's mom ran in 1 month.

Show your thinking.

Sample work shown.

	20	5	1
12	240	60	12

or

$$\begin{array}{r|l} 12\overline{)312} & \\ -120 & 12\times10 \\ \hline 192 & \\ -120 & 12\times10 \\ \hline 72 & \\ -\ 72 & 12\times6 \\ \hline 0 & \end{array} \quad 26$$

answer: 26 miles

3 Discuss Oral activity: No writing expected.

- Does your answer match the place value of your estimate? Why does that make sense?
- What was your first partial quotient? Why?
- What did you think about to determine the rest of your partial quotients?

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Repeatedly use 1 as their partial quotient.	$12\overline{)312}$ -12 12×1	**Support** Ask, "What is the place value of the quotient? How could that help you start with larger groups of 12?"
Use 10 as their first partial quotient.	$12\overline{)312}$ -120 12×10 192 -120 12×10 26 72 $-\ 72$ 12×6 0	**Strengthen** Ask, "Why did you decide to start with this as your first partial quotient? Would you always start with this as your first partial quotient? Why?"
Use 20 as their first partial quotient.	20 5 1 12 | 240 | 60 | 12	

Pairs | 20 min

Activity 2 Thinking About Thinking

Fluency

Purpose: Students estimate the place values of quotients and then determine partial quotients. They use multiples of 10 and then multiples of 1 to divide three-digit and four-digit dividends by two-digit divisors.

Presentation Screens



Short on time? Consider discussing Problem 6 as a class.

1 Launch



Read aloud the directions for Problems 4 and 5.

Use the Think-Pair-Share routine. Ask, "What will be the place value of each quotient? How do you know?"

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

EB **Emergent Bilinguals** As students discuss similarities and differences, provide them with sentence frames to support their discussion. For example, "Our partial quotients are similar in that we both . . ." and "Our partial quotients are different because we . . ., while you . . ." ELPS 1.E, 2.C, 2.E

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, "You know the quotient will be in the tens place. How can you use that information to help you choose your first partial quotient?"

3 Connect



Display students' work for Problem 5 that shows different partial quotients, such as those shown in the *Differentiation* table.

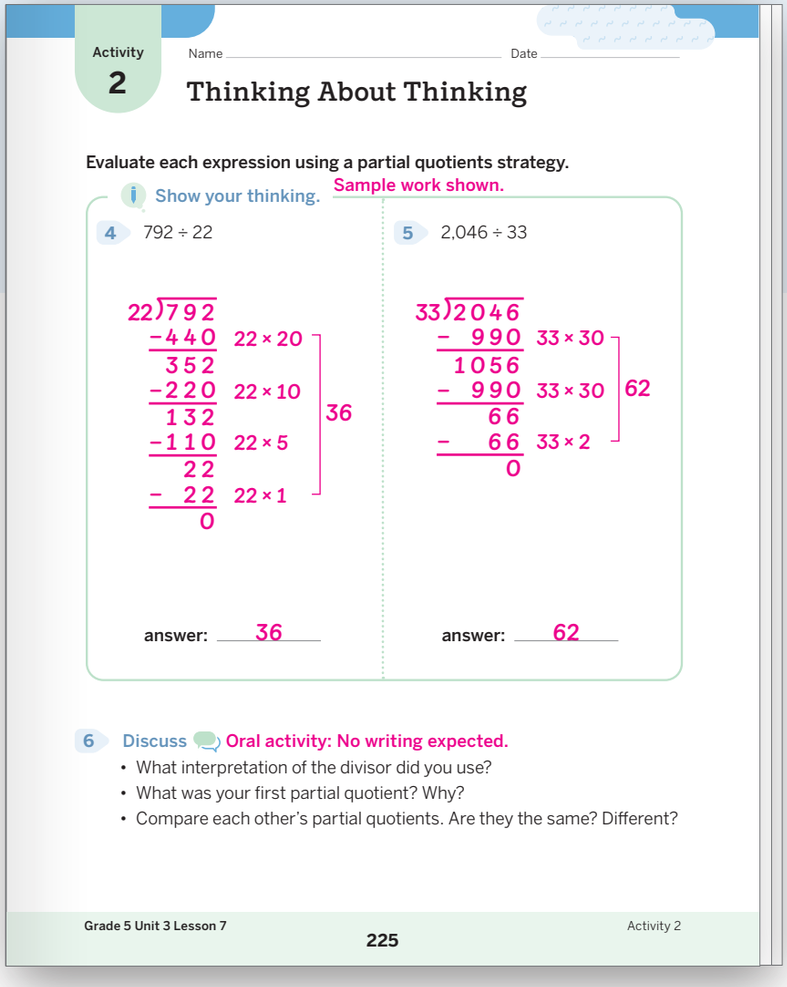
Ask:

- "How are each of these examples similar? How are they different?"
- "Why do different partial quotients result in the same final quotient?"

A **Accessibility: Visual-spatial processing** While students compare partial quotients, annotate the displayed work to guide visualization of vocabulary and strategies. For example, label terms, such as *doubling* or *tens*, and draw visual representations of grouping methods.

Key Takeaway: Say, "When dividing with multi-digit numbers, you might be able to combine some of your partial quotients. No matter which partial quotients you choose, the quotient will be the same."

Student Edition



Activity 2

Name _____ Date _____

Thinking About Thinking

Evaluate each expression using a partial quotients strategy.

Show your thinking. Sample work shown.

4 792 ÷ 22

```
22)792
-440   22 × 20
 352
-220   22 × 10
 132                 36
-110   22 × 5
  22
-  22   22 × 1
   0
```

answer: 36

5 2,046 ÷ 33

```
33)2046
-  990   33 × 30
 1056
-  990   33 × 30     62
   66
-   66   33 × 2
    0
```

answer: 62

6 Discuss Oral activity: No writing expected.

- What interpretation of the divisor did you use?
- What was your first partial quotient? Why?
- Compare each other's partial quotients. Are they the same? Different?

Grade 5 Unit 3 Lesson 7 225 Activity 2

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Use the place value of the quotient.	*I started with 10 × 33 because I know the place value of the quotient will be in the tens.*	**Strengthen** Ask, "Could you multiply the divisor by another 10? Then what could be your first partial quotient?"
Use doubling.	*I started with 20 × 33 because I know 20 × 33 is double 10 × 33, which will get me closer to the dividend.*	**Strengthen** Ask, "Will this strategy always work? Why or why not?"
Use estimation and known facts.	*I started with 60 × 33 because I estimated that 60 groups of 30 is 1,800, and the dividend is greater than that. So, I knew I could start with 60.*	**Stretch** Ask, "How do you know whether you have the most possible groups of any 1 place value?"

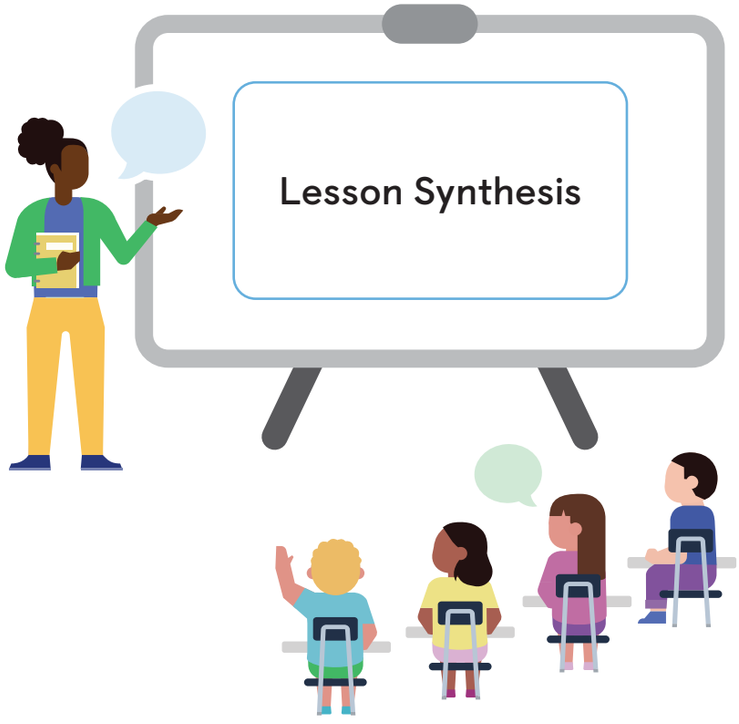
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: Just like with a one-digit divisor, it is helpful to consider the place value of the quotient when dividing by a two-digit divisor. Any interpretation of the divisor can be used and the quotient will be the same.



Say, "All 3 students had the same partial quotients when evaluating 312 ÷ 12."

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

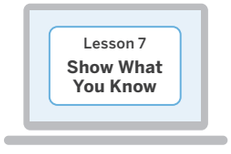
Say, "When determining partial quotients, it is helpful to begin by asking, 'What will be the place value of the quotient?' When recording partial quotients, you might record on the side with matching multiplication quotients, with only partial quotients, or on top. In all recording methods, the partial quotients are organized by place value."

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

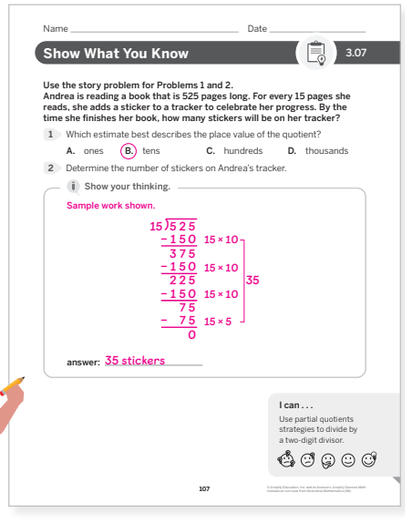
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.07

Use the story problem for Problems 1 and 2.
Andrea is reading a book that is 525 pages long. For every 15 pages she reads, she adds a sticker to a tracker to celebrate her progress. By the time she finishes her book, how many stickers will be on her tracker?

1 Which estimate best describes the place value of the quotient?
A. ones (B.) tens C. hundreds D. thousands

2 Determine the number of stickers on Andrea's tracker.
Show your thinking.

Sample work shown.

15)525
−150 15 × 10
375
−150 15 × 10
225
−150 15 × 10
75
− 75 15 × 5
0
35

answer: 35 stickers

I can . . .
Use partial quotients strategies to divide by a two-digit divisor.

107

Today's Goals

1. **Goal:** Divide a three- or four-digit dividend by a two-digit divisor, without remainders, starting with multiples of 10.
   - In Problem 2 in the *Show What You Know*, students solved a real-world problem involving a three-digit dividend and a two-digit divisor.
2. **Goal:** Use estimation to reason about the place value of the quotient.
   - In Problem 1 in the *Show What You Know*, students estimated the place value of the quotient in a real-world problem.
3. **Language Goal:** Explain how to determine partial quotients with a two-digit divisor. **(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 7
Practice

Students using digital

Students using print

Summary 3.07

It is important to think about your thinking when you are determining partial quotients. You can begin by asking yourself, "What is the place value of the quotient?" to help you determine a possible first partial quotient.

33)2046
− 990 33 × 30
1056
− 990 33 × 30
66
− 66 33 × 2
0
62

I know that the place value of the quotient is in the tens place because 33 × 10 is 330. 33 × 100 is 3,300, and that would be too much.

I can start by using 10 × 33 or using another 10.

Practice 3.07

1 The land area of Washington, D.C. is about 61 square miles. Rhode Island is about 1,214 square miles. Which is the best estimate for how many times Washington, D.C. can fit inside Rhode Island?

(A) 20 times (B) 12 times
(C) 1 time (D) 33 times

2 Jada earns $15 an hour babysitting. She thinks she needs to babysit 3,850 hours to save $5,775 for her college fund. Do you agree with Jada? Why or why not? Sample explanation shown.

No. Jada needs to babysit 385 hours because 385 × 15 is $5,775.

Grade 5 Unit 3 Lesson 7 226 Summary | Practice

Practice 3.07

Name _____ Date _____

For Problems 3 and 4, determine the quotient using partial quotients.

Show your thinking. Sample work shown.

3 3,120 ÷ 65

65)3120
− 2600 65 × 40
520
− 325 65 × 5
195
− 195 65 × 3
0
48

40 + 5 + 3 = 48

answer: 48

4 2,597 ÷ 53

40
5
4
49
53)2597
− 2120
477
− 265
212
− 212
0

40 + 5 + 4 = 49

answer: 49

Grade 5 Unit 3 Lesson 7 227 Practice

Practice 3.07

Name _____ Date _____

5 Determine the quotient 6,314 ÷ 77. Sample work shown.

Show your thinking.

77)6314
− 3850 77 × 50
2464
− 2310 77 × 30
154
− 154 77 × 2
0
82

50 + 30 + 2 = 82

answer: 82

Spiral Review

6 Shawn cuts a log into 8 pieces that are each $\frac{1}{3}$ of a foot long. Write an equation that represents the length of the log in feet. Sample response shown.

$8 \times \frac{1}{3} = \frac{8}{3}$

For Problems 7 and 8, determine the value of the expression.

Show your thinking. Sample work shown.

7 5(17 + 18) + 4(2)

5(17 + 18) + 4(2)
5(35) + 4(2)
175 + 8

answer: 183

8 10[5 + (14 + 6) ÷ 4]

10[5 + (14 + 6) ÷ 4]
10[5 + (20) ÷ 4]
10[5 + 5]
10[10]

answer: 100

Grade 5 Unit 3 Lesson 7 228 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	2	5.3.A
Fluency	2–5	2	5.3.C
Spiral Review			
	6	1	5.3.I
Fluency	7, 8	1	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 7

Lesson Goal: Divide a three- or four-digit dividend by a two-digit divisor, without remainders, starting with multiples of 10.

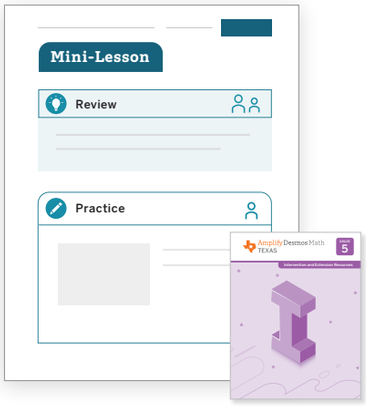
Support

Provide targeted intervention for students by using these resources.

If students repeatedly use 1 as their partial quotient:

Respond:

- Assign the *Dividing Three-Digit Dividends by Two-Digit Divisors Without Remainders* Mini-Lesson. | 15 min
- Revisit Lesson 6.



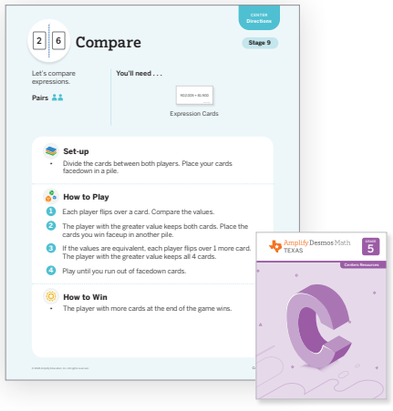
Strengthen

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

If students use 10 as their first partial quotient:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
- Have students complete **Lesson 7 Practice**. | 15 min
- **Item Bank**



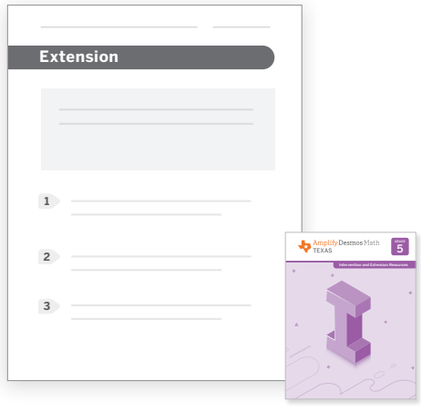
Stretch

Challenge students and extend their learning with these resources.

If students use the largest group of 10 as their partial quotient each time:

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., *quotient/cuociente*
- Frayer Model templates
- Vocabulary routines





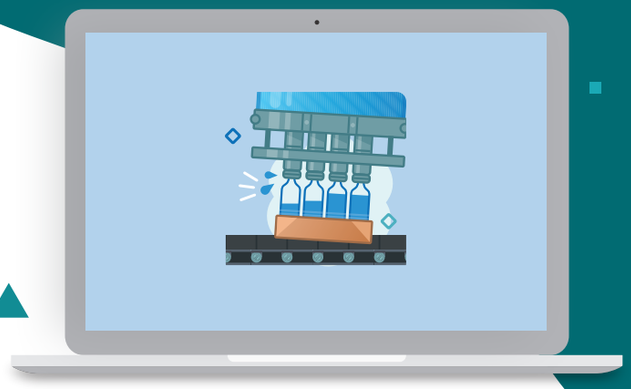
Professional Learning

What student work would you highlight if you taught this lesson again?

Unit 3
Lesson
8

Student devices recommended

Students can use devices to interact with this lesson. The Student Edition also supports learning.



Emptying the Water Tank

Determining 1 Partial Quotient for Each Place Value

Let's use place value to determine partial quotients.

Key Concepts

Today's Goals

1. **Goal:** Use partial quotients to divide three- and four-digit dividends by two-digit divisors without remainders.
2. **Language Goal:** Explain how to solve the same problem using different partial quotients. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students continue to practice using partial quotients strategies to divide multi-digit dividends by two-digit divisors without remainders. They see that they can use their place value understanding to make 1 partial quotient for each place value. Students analyze a given partial quotients strategy and determine different ways to modify it when given restraints on the number of partial quotients allowed. **(TEKS 5.1.E, 5.1.F)**

Prior Learning

In Lesson 7, students used partial quotients strategies to divide three- and four-digit dividends by two-digit divisors, resulting in quotients in the tens place without remainders. They considered different ways to form partial quotients.

Future Learning

In Lesson 9, students will divide multi-digit dividends by two-digit divisors using the standard algorithm.

Depth and Rigor of Student Thinking

- Students continue to develop their **procedural skills** for dividing three- and four-digit dividends by two-digit divisors as they consider different strategies to choose partial quotients.

Vocabulary

Review Vocabulary

partial quotients

quotient

TEKS

Addressing

5.3.C

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Math Process Practices: 5.1.E, 5.1.F

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

Building On	Building Toward
4.4.F	6.3.E

Building Math Identity

We are a math community.
How do you support your classmates as math thinkers and problem solvers? How do they support you?

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, 5.3.C



Why digital?

Students can engage in multiple trials to support their understanding of using a partial quotients strategy.

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about a water tank that will be emptied by filling crates of bottles. This prepares them to use the same context in Activity 1.

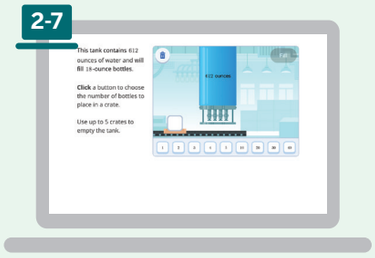


Activity 1 Fluency

Pairs | 35 min

Students choose partial quotients to divide three- and four-digit dividends by two-digit divisors. In the context of emptying a water tank with given constraints, students see that they can use place value understanding to strategically choose their partial quotients.

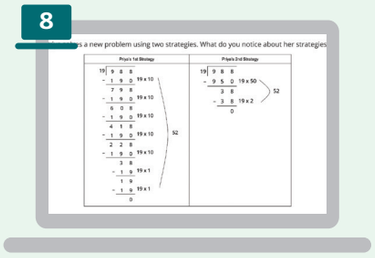
Note: The Student Edition is not required for this activity.



Synthesis

Whole Class | 10 min

Students review and reflect on using place value reasoning to determine partial quotients when dividing a three-digit dividend by a two-digit divisor.

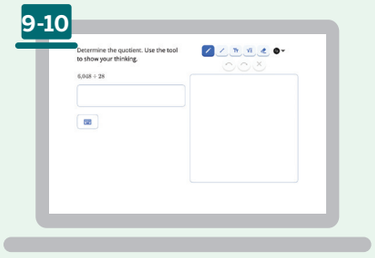


Show What You Know

Independent | 5 min

Students demonstrate their understanding by using partial quotients to divide by a two-digit divisor.

Students using print: *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.

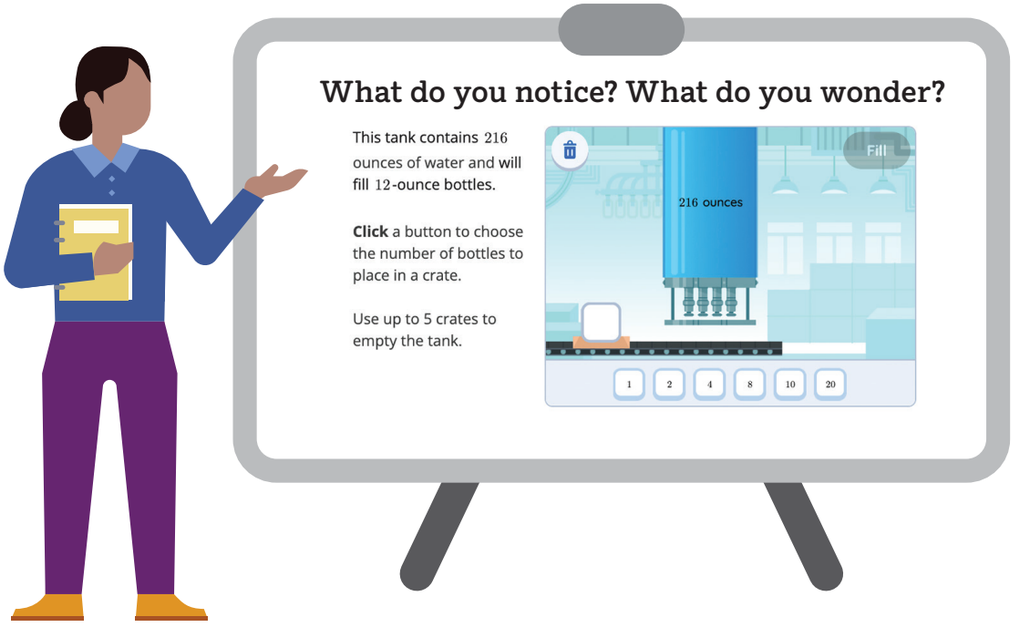
Whole Class | 10 min | Suggested Pacing: Screen 1

Warm-Up Notice and Wonder

Purpose: Students examine ways to empty a water tank using crates that hold different numbers of bottles to prepare for using the same context in Activity 1.

Students using print







1 Launch

1 **Display** the image.

Say, "The water tank contains 216 ounces of water."

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 which buttons to click to see the crates of 12-ounce bottles fill up with water.

2 Connect

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

Ask, "How might you choose which number of bottles to start with?"

A **Accessibility: Conceptual processing** Connect the bottling process to the corresponding math concepts, e.g., the bottles represent the quotient and the crates represent each partial quotient.

Students might say . . . ELPS 2.B

I notice that the water in the tank lowers as the bottles fill up.

I notice that if there are too many bottles, the water tank is emptied, but some of the bottles are not full.

I wonder why the crates can only hold 1, 2, 4, 8, 10, or 20 bottles.

I wonder if the water tank can be emptied using the same number of bottles in a crate each time.

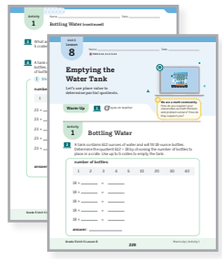
Pairs | 35 min | Suggested Pacing: Screens 2-7

Activity 1 Bottling Water

Fluency

Purpose: Students choose partial quotients to divide multi-digit dividends by two-digit divisors. They see that they can use place value understanding to strategically choose partial quotients.

Students using print



1 Launch



Note: All students should have access to paper to work through each problem. They are not expected to use mental math to determine each quotient.

2 **Say**, "A factory uses tanks of water to fill crates of bottles. Each water tank holds an amount of water that will be emptied into different-sized bottles. Complete Screens 2–7 with your partner."

Students using print: Display Screen 2. Say, "Show your division on the right side of the workspace. On the left, complete the multiplication equations by determining how many bottles you need and the total number of ounces of water used for that crate."

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

2 Monitor



While students complete **Screen 4**, refer to the D Differentiation | Teacher Moves table on the following page.

2-6 **If students need help getting started . . .**

- Ask, "Which number of bottles will empty the most water?"
- Ask, "Which number of bottles do you want to start with?"

3 Connect



7 **Invite students to share** their responses for Screen 7.

Ask, "How can you use place value to help you determine which partial quotients to use when dividing with multi-digit numbers?"

Key Takeaway: Say, "You can use your understanding of place value to strategically choose partial quotients. Depending on the partial quotients you choose, you may have 1 partial quotient for each place value."

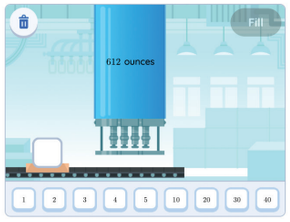
Students using digital

2-3

This tank contains 612 ounces of water and will fill 18-ounce bottles.

Click a button to choose the number of bottles to place in a crate.

Use up to 5 crates to empty the tank.



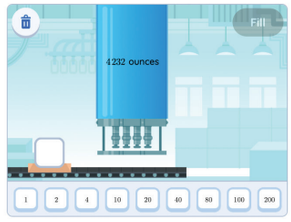
Students choose the number of 18-ounce bottles needed to empty the tank of 612 ounces. They may explain that multiples of tens can be emptied into 1 crate to use fewer total crates.

4-5

This tank contains 4,232 ounces of water and will fill 23-ounce bottles.

Click a button to choose the number of bottles to place in a crate.

Use up to 5 crates to empty the tank.



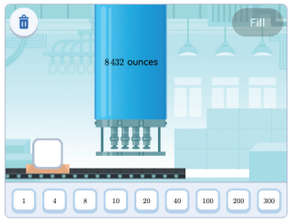
Students choose the number of 23-ounce bottles needed to empty the tank of 4,232 ounces. They may explain that 1 crate can be used for each place value.

6

This tank contains 8,432 ounces of water and will fill 34-ounce bottles.

Click a button to choose the number of bottles to place in a crate.

Use up to 5 crates to empty the tank.



Students choose the number of 34-ounce bottles to empty the tank of 8,432 ounces. They may choose 1 crate of 200 bottles, 1 crate of 40 bottles, and 1 crate of 8 bottles.

7

Here is a diagram of Priya's work showing 8,432 ounces of water being emptied into crates of 34-ounce bottles.

Discuss
How can she change her strategy so that 3 or fewer crates are used to fill the 34-ounce water bottles?

```
34 | 8 4 3 2
   -3 4 0 0   34 x 100
   ---------
   5 0 3 2
   -3 4 0 0   34 x 100
   ---------
   1 6 3 2
   - 6 8 0    34 x 20
   ---------
     9 5 2
   - 3 4 0    34 x 10      248
   ---------
     6 1 2
   - 3 4 0    34 x 10
   ---------
     2 7 2
   - 1 7 0    34 x 5
   ---------
     1 0 2
   - 1 0 2    34 x 3
   ---------
           0
```

Students may explain that Priya can combine like partial quotients, such as 100 and 100, or 20, 10, and 10, to divide fewer times.

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

D Differentiation | Teacher Moves

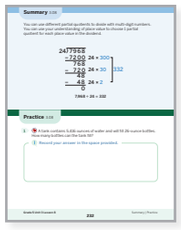
Look for students who . . .	For example . . .	Provide support . . .
Almost there Choose partial quotients that have a total number of ounces that is greater than the dividend.	23 × 200 = 4,600	**Support** Ask, "What do you know about the amount of water in the tank? Is there enough water in the tank to fill the number of bottles you chose?"
Almost there Choose 5 partial quotients that result in a remainder.	23 × 100 = 2,300 23 × 40 = 920 23 × 20 = 460 23 × 20 = 460 23 × 3 = 69 remaining in tank: 23	**Support** Ask, "How could you use some or all 5 crates to empty all the water in the tank?"
Choose up to 5 partial quotients that fully empty the tank.	23 × 100 = 2,300 23 × 40 = 920 23 × 40 = 920 23 × 4 = 92	**Strengthen** Ask, "Could you use fewer than 5 crates, or partial quotients, to empty the tank? How do you know?"
Choose 3 partial quotients, one for each place value of the quotient, that fully empty the tank.	23 × 100 = 2,300 23 × 80 = 1,840 23 × 4 = 92	**Stretch** Ask, "What strategy did you use to choose your partial quotients? Will this always work?"

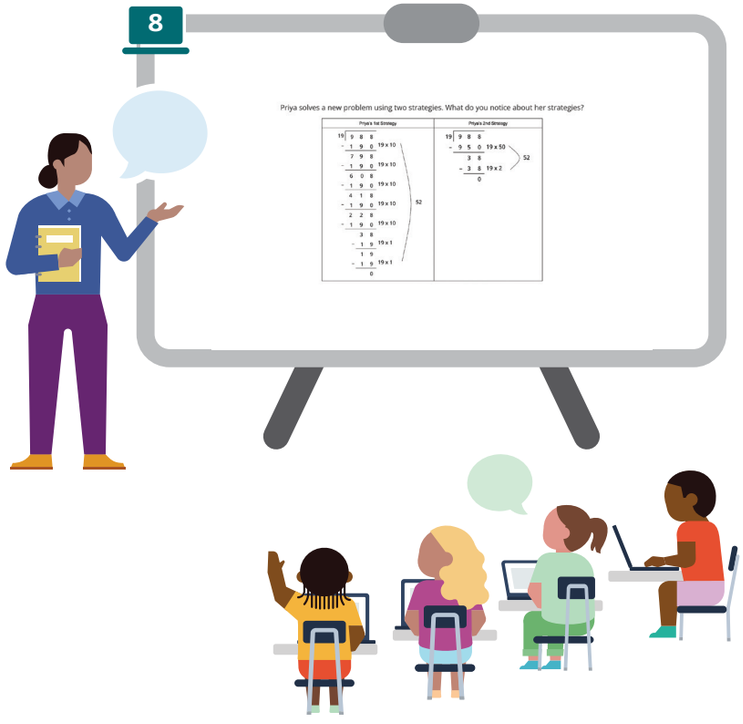
Whole Class | 10 min | Suggested Pacing: Screen 8

Synthesis

Lesson Takeaway: Place value understanding can be used to strategically choose partial quotients.

Students using print





8 **Ask**, "Priya solved another problem using 2 strategies. What do you notice about the strategies she used?"

Say, "You have seen that there are many ways to choose partial quotients when dividing with multi-digit numbers. You can use your understanding of place value to strategically choose partial quotients. This can help you evaluate an expression using fewer partial quotients."

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

Show What You Know

Independent | 5 min

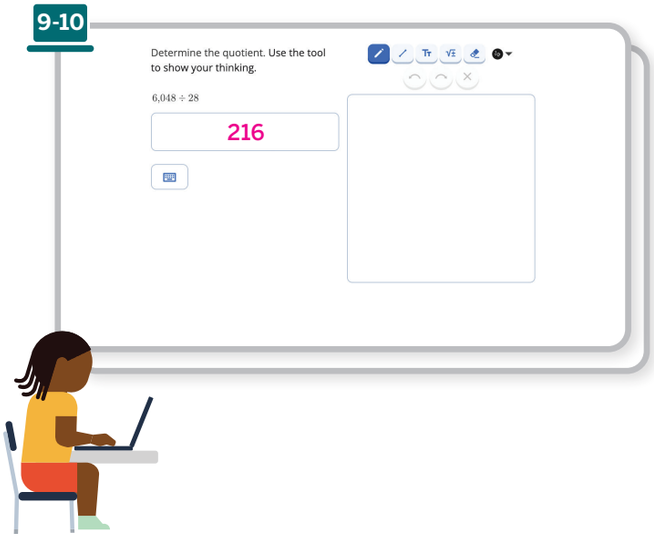
Suggested Pacing: Screens 9-10

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Use partial quotients to divide three- and four-digit dividends by two-digit divisors without remainders.
   - In the *Show What You Know*, students used partial quotients to divide a four-digit dividend by a two-digit divisor.
2. **Language Goal:** Explain how to solve the same problem using different partial quotients. **(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 8
Practice

Students using digital

Students using print

Summary 3.08

You can use different partial quotients to divide with multi-digit numbers. You can use your understanding of place value to choose 1 partial quotient for each place value in the dividend.

```
24)7968
-7200   24 × 300
 768
-720   24 × 30      332
  48
 -48   24 × 2
   0
```

7,968 ÷ 24 = 332

Practice 3.08

1 A tank contains 5,416 ounces of water and will fill 26-ounce bottles. How many bottles can the tank fill?

Record your answer in the space provided.

208 bottles

Practice 3.08

Name _____ Date _____

For Problems 2 and 3, determine the quotient using 5 or fewer partial quotients. Sample work shown.

Show your thinking.

2 851 ÷ 23

```
23)851
-460   23 × 20
 391
-230   23 × 10      37
 161
-115   23 × 5
  46
 -46   23 × 2
   0
```

answer: 37

3 7,224 ÷ 43

```
43)7224
-4300   43 × 100
 2924
-2150   43 × 50
  774
-430   43 × 10      168
  344
-215   43 × 5
  129
-129   43 × 3
    0
```

answer: 168

Practice 3.08

Name _____ Date _____

4 Which expression has a quotient of 205? Sample work shown.

(A) 2,052 ÷ 18 (B) 6,125 ÷ 25 (C) 7,500 ÷ 30 (D) 7,585 ÷ 37

Show or explain your thinking.

```
37)7585
-7400   37 × 200
 185
-74   37 × 2       205
 111
-74   37 × 2
  37
-37   37 × 1
   0
```

Spiral Review

5 A carpenter is building a cargo container in the shape of a rectangular prism. The dimensions of the container are 6 yards by 2 yards by 4 yards. Determine the volume of the container in cubic yards.

48 cubic yards

6 The stem and leaf plot shows the lengths of yarn Andrea's mom has in her sewing kit. What is the difference between the longest length and shortest length?

Yarn Lengths

Stem	Leaf
1	2 4
2	1 2 5
3	1 7 7 8

1|2 means a length of 1.2.

answer: 2.6

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Test Practice	1	2	5.3.C
Fluency	2–4	1	5.3.C
Spiral Review			
	5	2	5.4.H
	6	2	4.9.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 8

Lesson Goal: Use partial quotients to divide three- and four-digit dividends by two-digit divisors without remainders.

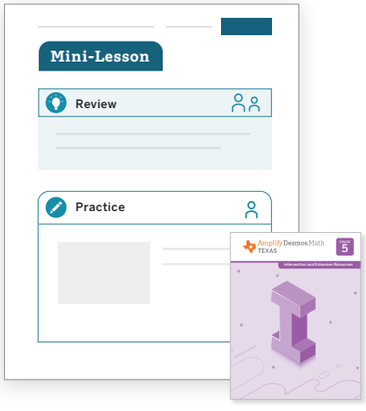
Support

Provide targeted intervention for students by using these resources.

If students choose up to 5 partial quotients and have a remainder in the quotient:

Respond:

- Assign the *Using Partial Quotients To Divide By Place* Mini-Lesson. | 15 min
- Review the concept of creating equal groups of the divisor.



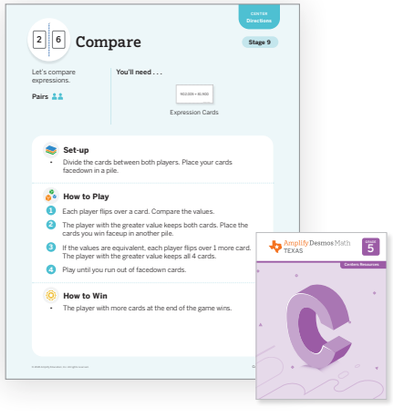
Strengthen

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

If students choose up to 5 partial quotients:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
- Have students complete **Lesson 8 Practice**. | 15 min
- **Item Bank**



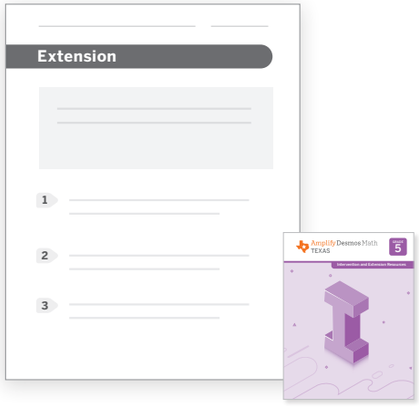
Stretch

Challenge students and extend their learning with these resources.

If students choose 3 partial quotients, one for each place value of the quotient:

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, e.g., *quotient/cuociente*
- Frayer Model templates
- Vocabulary routines



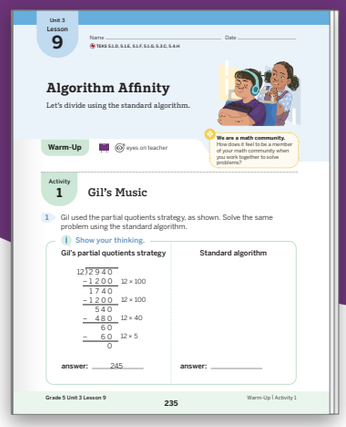


Professional Learning

Reflect on today's participation. What might have prevented students from participating? What changes will you make?

Unit 3
Lesson
9

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



Algorithm Affinity

Dividing Multi-Digit Dividends by Two-Digit Divisors Using the Standard Algorithm

Let's divide using the standard algorithm.

Key Concepts

Today's Goals

1. **Goal:** Divide a four-digit dividend by a two-digit divisor using the standard algorithm.
2. **Language Goal:** Compare how the partial quotients strategy and the standard algorithm are used to solve division problems with four-digit dividends and two-digit divisors. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students use and compare partial quotients strategies and the standard algorithm to divide four-digit dividends by two-digit divisors. They apply their understanding of the standard algorithm to division expressions resulting in remainders. Students analyze and communicate the meaning of a remainder in relation to a problem using precise language. **(TEKS 5.1.D, 5.1.E, 5.1.F, 5.1.G)**

Prior Learning

In Lesson 8, students used partial quotients strategies to divide three- and four-digit dividends by two-digit divisors. They considered the place value of the quotients and determined that they can make 1 partial quotient for each place value of the quotient.

Future Learning

In Lesson 10, students will continue to divide multi-digit dividends, resulting in remainders. They will consider how quotients with remainders can be represented as mixed numbers.

Integrating Rigor in Student Thinking

- Students develop **procedural skills** with the standard algorithm as they divide four-digit dividends by two-digit divisors.
- Students build **fluency** dividing four-digit dividends by two-digit divisors using the standard algorithm.

Vocabulary

Review Vocabulary

dividend

divisor

partial quotients

quotients

remainder

TEKS

Addressing

5.3.C

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Also Addressing: 5.4.H

Math Process Standards: 5.1.C, 5.1.D, 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.A, 3.E, 3.F, 3.G, 3.H

Building On	Building Toward
4.4.F	**6.3.E**

Building Math Identity

We are a math community.

How does it feel to be a member of your math community when you work together to solve problems?

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

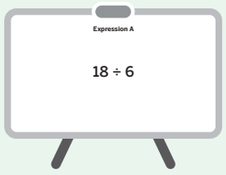
Lesson at a Glance 60 min

TEKS: 5.1.C, 5.1.D, 5.1.E, 5.1.F, 5.1.G, 5.3.C, 5.4.H

Warm-Up Fluency

Whole Class | 10 min

Students use the **Number Talk** routine, in which they evaluate related expressions that highlight quotients involving remainders. The expressions prepare them to consider the implications of remainders when dividing larger numbers in Activity 2. **(TEKS 5.1.C)**



Activity 1 Fluency

Pairs | 15 min

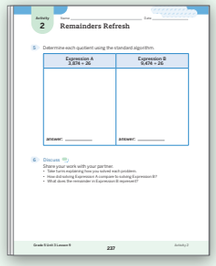
Students solve real-world problems in which they divide a four-digit dividend by a two-digit divisor. They compare partial quotients strategies to the standard algorithm.



Activity 2 Fluency

Independent | 20 min

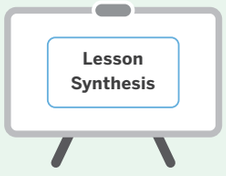
Students apply their work from Activity 1 to practice dividing four-digit dividends by two-digit divisors. They solve expressions that result in remainders and explain the meanings of the remainders.



Synthesis

Whole Class | 10 min

Students review and reflect on the final steps of the standard algorithm when dividing a four-digit dividend by a two-digit divisor.

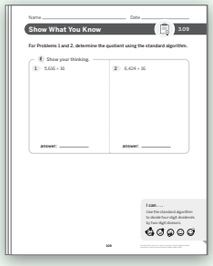


Show What You Know

Independent | 5 min

Students demonstrate their understanding by determining the quotient of a four-digit dividend and a two-digit 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
- ✓ Visuals
- ✓ Sentence frames and word bank

ELPS 1.E, 2.C, 2.D, 2.E, 2.F, 3.C, 3.E, 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 and **read** English. They **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** and **write** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** and **write** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** and **write** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

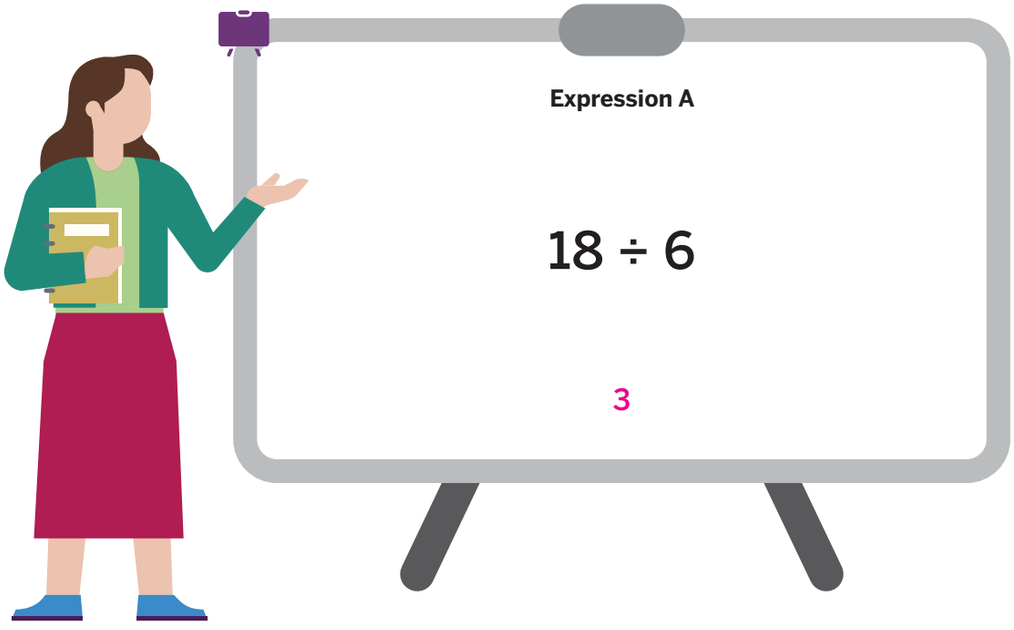
Presentation Screen



Warm-Up Number Talk

Fluency

Purpose: Students determine quotients with and without remainders to make connections between multiplication and division and to prepare for working with remainders in Activity 2.



Expression B

20 ÷ 6

3 R2

Expression C

60 ÷ 6

10

Expression D

58 ÷ 6

9 R2

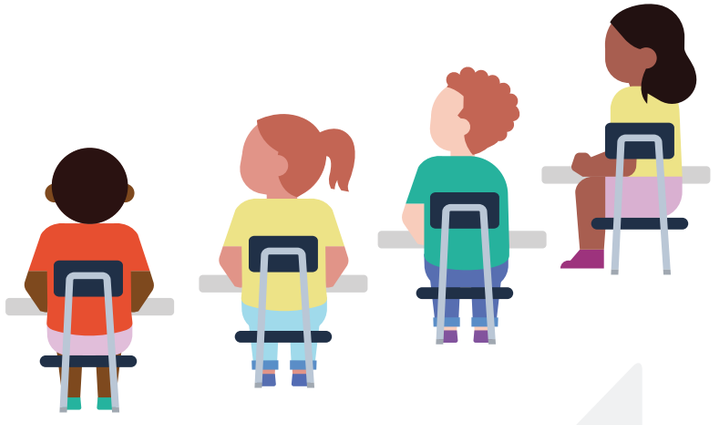
Why these problems? These expressions lend themselves to reasoning about remainders when determining quotients.

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 Expression D.

Ask (if not yet mentioned during discussion),

- "How might multiplication relate to your work with division?"
- "How could you use Expression C to help you evaluate Expression D?"

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

A: *I know that 3 times 6 is 18, so 18 divided by 6 is 3.*

B: *Because 18 divided by 6 is 3, I knew it would be 3 R2 because 20 is 2 more than 18, and there isn't another group of 6.*

C: *I know 6 times 10 is 60, so 60 divided by 6 is 10.*

D: *I know 6 times 10 is 60, so my quotient would be one less. I got 9 groups of 6 and 4 remaining, so 9 R4.*

Pairs | 15 min

Activity 1 Gil's Music

Fluency

Purpose: Students solve division story problems involving a four-digit dividend and a two-digit divisor using the standard algorithm.

Presentation Screens



Short on time? Consider completing Problems 1 and 2 as a whole class.

1 Launch



MLR **MLR6: Three Reads** ELPS 1.E, 2.F, 3.A, 3.F, 3.G, 3.H

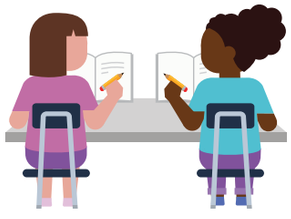
Read the story problem aloud three times.

- **Read 1:** Say, "Tell your partner what happened in the story without using any numbers."
- **Read 2:** Ask, "What math did Gil use to solve the problem?"
- **Read 3:** Ask, "What might be a good first step in solving this problem using the standard algorithm?"

Say, "Complete Problem 1 with your partner. You will join another pair to complete Problem 2 and then work with your partner to complete Problems 3 and 4."

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 place value of the dividend can help you choose a first factor for your divisor?"
- Ask, "What are the multiples of the divisor?"

3 Connect



Display Gil's partial quotients strategy alongside the completed standard algorithm from Problem 1.

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

Use the Think-Pair-Share routine. Ask:

- "How is the standard algorithm similar to the partial quotients strategy?"
- "How are the strategies different?"

Key Takeaway: Say, "You can use the partial quotients strategy or the standard algorithm to divide four-digit dividends by two-digit divisors."

Student Edition

Unit 3 Lesson 9

Name _____ Date _____

TEKS 5.1.D, 5.1.E, 5.1.F, 5.1.G, 5.3.C, 5.4.H

Algorithm Affinity

Let's divide using the standard algorithm.



We are a math community. How does it feel to be a member of your math community when you work together to solve problems?

Warm-Up eyes on teacher

Activity 1

Gil's Music

1 Gil used the partial quotients strategy, as shown. Solve the same problem using the standard algorithm. Sample work shown.

Show your thinking.

Gil's partial quotients strategy

```
12)2940
-1200   12 × 100
 1740
-1200   12 × 100
  540
 -480   12 × 40
   60
  -60   12 × 5
    0
```

answer: 245

Standard algorithm

```
  245
12)2940
-24↓
  54
 -48↓
   60
  -60
    0
```

answer: 245

Activity 1

Name _____ Date _____

Gil's Music (continued)

2 Discuss Oral activity: No writing expected.

Join another pair.

- Compare the process of the partial products strategy to the standard algorithm.
- What is the same? What is different?

3 Choose one of the strategies from Problem 1 to solve.
The area of the auditorium is 5,232 square feet. The length is 16 feet.
What is the width of the auditorium?

Show your thinking. Sample work shown.

```
 327
16)5232
-48↓
  43
 -32↓
  112
 -112
    0
```

answer: 327 feet

4 Solve using the standard algorithm.
There are 35 seats in each row of the school auditorium at Gil's school.
How many rows are needed to seat 1,295 students?

Show your thinking. Sample work shown.

```
  37
35)1295
-105↓
  245
 -245
    0
```

answer: 37 rows

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Divide the divisor equally into the dividend and determine that the quotient is 2,450.	2450 12)2940	**Support** Ask, "Which place value of the dividend did you use to determine the first digit in the quotient? How can you organize your quotient to reflect this?"
Almost there Divide the divisor into the dividend fewer times than possible.	23 12)2940 -24↓ 54 -36 18	**Support** Ask, "What do you notice about the difference between 54 and 36 compared to the divisor? What does that mean?"
Divide the divisor equally into the dividend using the standard algorithm.	245 12)2940 -24↓ 54 -48↓ 60 -60 0	**Strengthen** Ask, "How can you check your work?"

Independent | 20 min

Activity 2 Remainders Refresh

Fluency

Purpose: Students practice evaluating division expressions involving four-digit dividends and two-digit divisors with a remainder using the standard algorithm.

Presentation Screens



1 Launch



Say, "Solve Problem 5 independently. Discuss Problem 6 with your partner and then complete Problems 7 and 8 independently."

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

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, "How can you use strategies from Activity 1 to get started?"
- Ask, "What are the multiples of 26?"

3 Connect



Invite students to share their responses and strategies for Expression B in Problem 5.

Use the Think-Pair-Share routine. Ask, "How did you know when you were finished?"

Key Takeaway: Say, "Just like dividing with one-digit divisors using the standard algorithm, sometimes there is a remainder. Remainders must be less than the divisor. Otherwise, it means the dividend can be divided into at least 1 more equal group."

Activity 2

Name _____ Date _____

Remainders Refresh

5 Determine each quotient using the standard algorithm.

Expression A 3,874 ÷ 26	Expression B 9,474 ÷ 26
149 26)3874 −26↓ 127 −104↓ 234 − 234 0	364 R10 26)9474 −78↓ 167 −156↓ 114 − 104 10
answer: 149	answer: 364 R10

6 Discuss Oral activity: No writing expected.

Share your work with your partner.

- Take turns explaining how you solved each problem.
- How did solving Expression A compare to solving Expression B?
- What does the remainder in Expression B represent?

Activity 2

Name _____ Date _____

Remainders Refresh (continued)

Determine each quotient using the standard algorithm.

Show your thinking. Sample work shown.

7 7,018 ÷ 24

292 R10
24)7018
−48↓
221
−216↓
58
− 48
10

answer: 292 R10

8 6,145 ÷ 24

256 R1
24)6145
−48↓
134
−120↓
145
− 144
1

answer: 256 R1

D Differentiation | Teacher Moves

Presentation Screens

Look for students who . . .	For example . . .	Provide support . . .
Almost there Divide the divisor equally into the dividend using the standard algorithm without attending to the remainder.	364 R10 26)9474 −78↓ 167 −156↓ 114 − 104 10	**Support** Ask, "What does the 10 represent? How does having a difference other than 0 affect the quotient?"
Divide the divisor equally into the dividend using the standard algorithm and determine that the quotient is 364 R10.	364 R10 26)9474 −78↓ 167 −156↓ 114 − 104 10	**Stretch** Ask, "Are there scenarios when a remainder would not make sense? When might that happen?"

Whole Class | 10 min

Synthesis

Lesson Takeaway: The standard algorithm can be used to divide four-digit dividends by two-digit divisors with or without remainders.

Presentation Screens





Use the Think-Pair-Share routine. Ask, "What would you do next to determine the quotient? Explain your thinking."

Ask (if not yet mentioned during discussion), "Would this quotient have a remainder? Why or why not?"

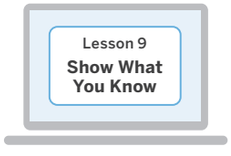
Say, "It is helpful to have a variety of strategies to choose from when dividing with multi-digit numbers. The standard algorithm can be used to evaluate expressions with or without remainders."

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

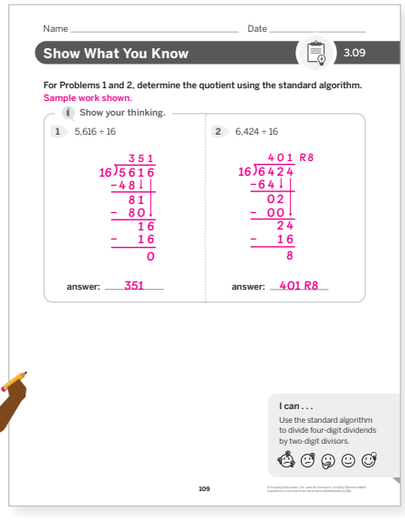
Show What You Know (Optional)

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.09

For Problems 1 and 2, determine the quotient using the standard algorithm.
Sample work shown.

Show your thinking.

1 5,616 ÷ 16

$$\begin{array}{r} 351 \\ 16\overline{)5616} \\ -48\,\downarrow\,\downarrow \\ \hline 81 \\ -80\,\downarrow \\ \hline 16 \\ -16 \\ \hline 0 \end{array}$$

answer: 351

2 6,424 ÷ 16

$$\begin{array}{r} 401\ R8 \\ 16\overline{)6424} \\ -64\,\downarrow\,\downarrow \\ \hline 02 \\ -00\,\downarrow \\ \hline 24 \\ -16 \\ \hline 8 \end{array}$$

answer: 401 R8

I can . . .
Use the standard algorithm to divide four-digit dividends by two-digit divisors.

109

Today's Goals

1. **Goal:** Divide a four-digit dividend by a two-digit divisor using the standard algorithm.
   - In Problems 1 and 2 in the *Show What You Know*, students used the standard algorithm to evaluate an expression involving a four-digit dividend and a two-digit divisor.
2. **Language Goal:** Compare how the partial quotients strategy and the standard algorithm are used to solve division problems with four-digit dividends and two-digit divisors. **(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

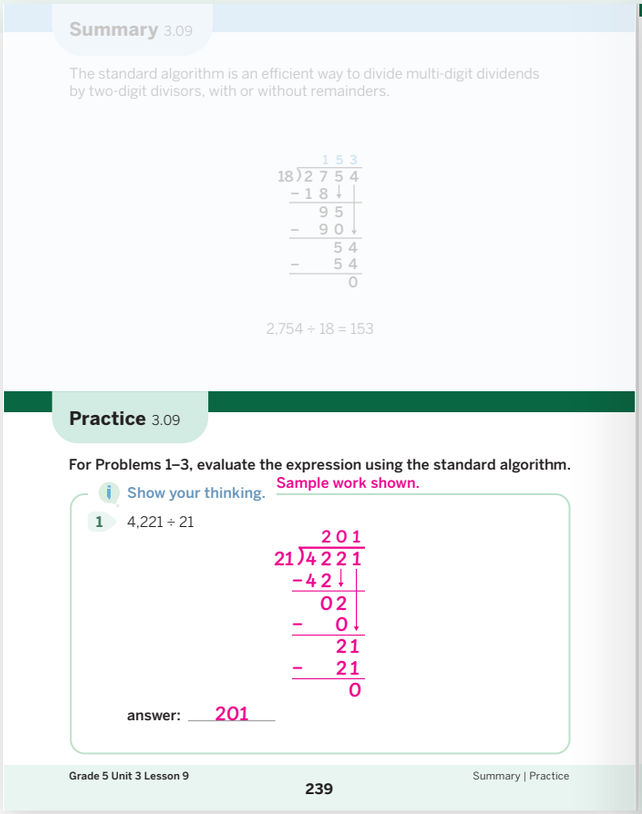
Independent

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 9
Practice

Students using digital

Students using print



Summary 3.09

The standard algorithm is an efficient way to divide multi-digit dividends by two-digit divisors, with or without remainders.

```
      1 5 3
18 ) 2 7 5 4
   - 1 8 ↓
       9 5
   -   9 0 ↓
         5 4
   -     5 4
           0
```

2,754 ÷ 18 = 153

Practice 3.09

For Problems 1–3, evaluate the expression using the standard algorithm.

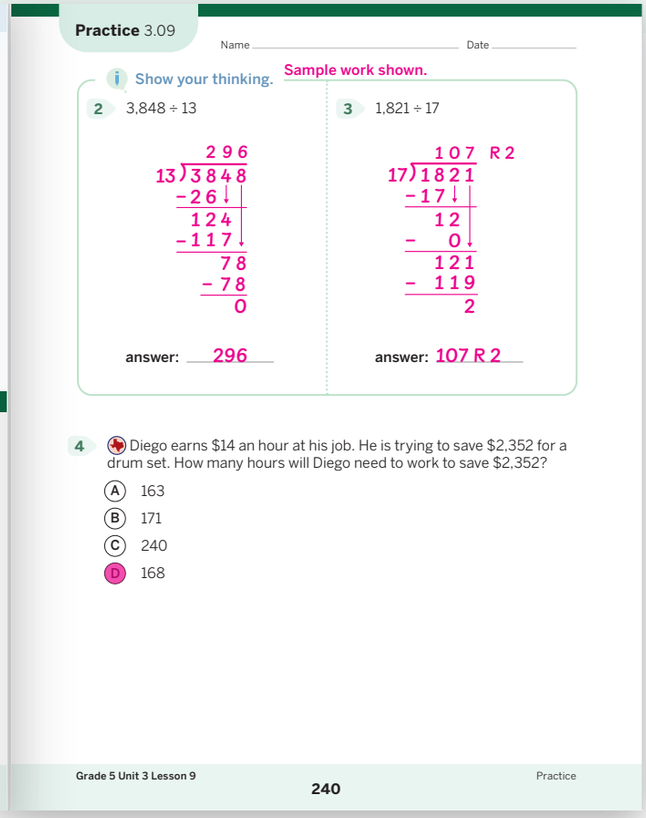
Show your thinking. Sample work shown.

1 4,221 ÷ 21

```
      2 0 1
21 ) 4 2 2 1
   - 4 2 ↓
       0 2
   -     0 ↓
         2 1
   -     2 1
           0
```

answer: 201

Grade 5 Unit 3 Lesson 9 239 Summary | Practice



Practice 3.09

Name _____ Date _____

Show your thinking. Sample work shown.

2 3,848 ÷ 13

```
      2 9 6
13 ) 3 8 4 8
   - 2 6 ↓
     1 2 4
   - 1 1 7 ↓
         7 8
       - 7 8
           0
```

answer: 296

3 1,821 ÷ 17

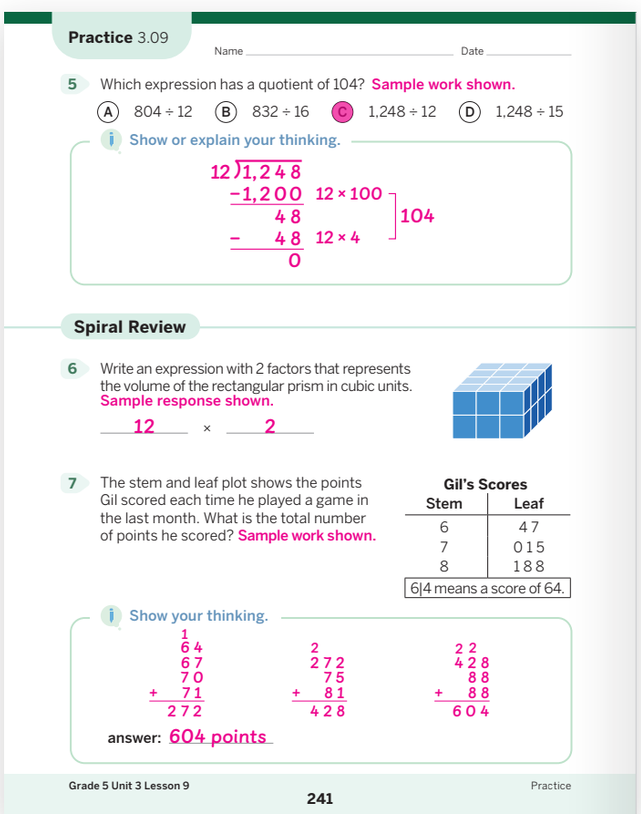
```
      1 0 7  R 2
17 ) 1 8 2 1
   - 1 7 ↓
       1 2
   -     0 ↓
       1 2 1
   -   1 1 9
           2
```

answer: 107 R 2

4 Diego earns $14 an hour at his job. He is trying to save $2,352 for a drum set. How many hours will Diego need to work to save $2,352?

(A) 163
(B) 171
(C) 240
(D) 168

Grade 5 Unit 3 Lesson 9 240 Practice



Practice 3.09

Name _____ Date _____

5 Which expression has a quotient of 104? Sample work shown.

(A) 804 ÷ 12 (B) 832 ÷ 16 (C) 1,248 ÷ 12 (D) 1,248 ÷ 15

Show or explain your thinking.

```
12 ) 1,2 4 8
   - 1,2 0 0   12 × 100
         4 8
   -     4 8   12 × 4
           0
```

104

Spiral Review

6 Write an expression with 2 factors that represents the volume of the rectangular prism in cubic units. Sample response shown.

12 × 2

7 The stem and leaf plot shows the points Gil scored each time he played a game in the last month. What is the total number of points he scored? Sample work shown.

Gil's Scores

Stem	Leaf
6	4 7
7	0 1 5
8	1 8 8

6|4 means a score of 64.

Show your thinking.

```
   1
   6 4
   6 7
   7 0
 +   7 1
   2 7 2
```

```
   2
   2 7 2
     7 5
 +   8 1
   4 2 8
```

```
   2 2
   4 2 8
     8 8
 +   8 8
   6 0 4
```

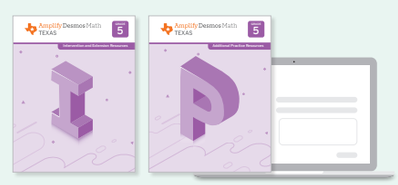
answer: 604 points

Grade 5 Unit 3 Lesson 9 241 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Fluency	1–3	1	5.3.C
Test Practice	4	1	5.3.C
Fluency	5	1	5.3.C
Spiral Review			
	6	2	5.4.H
	7	2	4.9.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: Divide a four-digit dividend by a two-digit divisor using the standard algorithm.

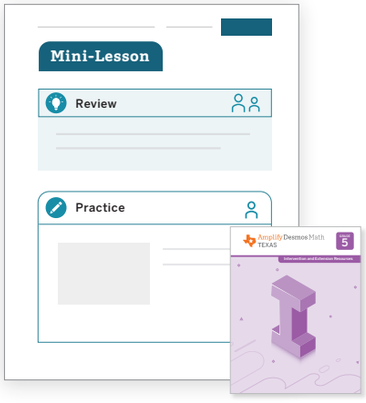
Support

Provide targeted intervention for students by using these resources.

If students use the standard algorithm and identify the dividend, divisor, or remainder as the quotient:

Respond:

- Assign the *Dividing Four-Digit Dividends by Two-Digit Divisors Without Remainders* Mini-Lesson. | 15 min
- Review the connection between the quotient and separating the dividend into equal groups.



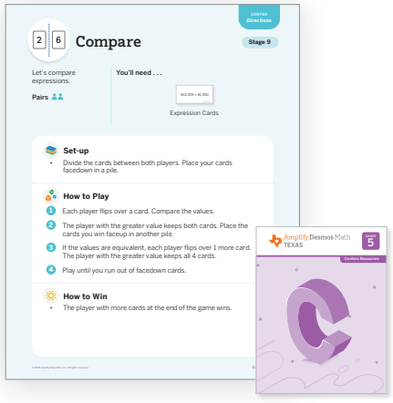
Strengthen

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

If students divide the divisor equally into the dividend using the standard algorithm:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
  Watch Your Remainder:
  - ***One-Digit Divisors***
  - *Two-Digit Divisors*
- Have students complete **Lesson 9 Practice**. | 15 min
- **Item Bank**



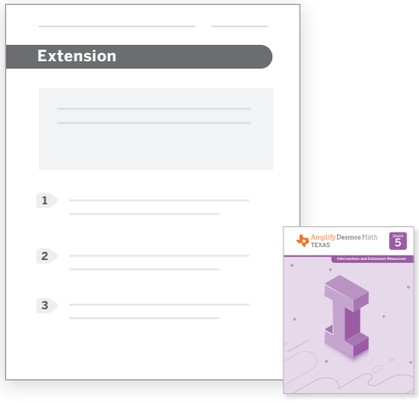
Stretch

Challenge students and extend their learning with these resources.

If students divide the divisor equally into the dividend using the standard algorithm and record the leftover as a remainder:

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., *quotient/cuociente*
- Frayer Model templates
- Vocabulary routines





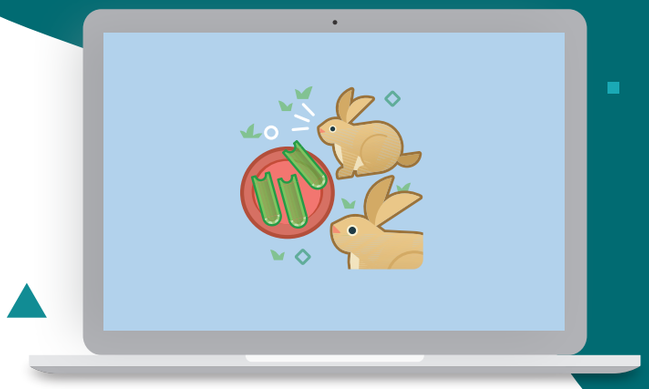
Professional Learning

How could you leverage students' understanding of remainders in preparation for the next lesson?

Unit 3
Lesson
10

Student devices recommended

Students can use devices to interact with this lesson. The Student Edition also supports learning.



Celery Chop

Representing Remainders

Let's solve division problems with remainders and represent the quotients as mixed numbers.

Key Concepts

Today's Goals

1. **Goal:** Use partial quotients to divide three-digit and four-digit dividends by one-digit and two-digit divisors with remainders and rename quotients as mixed numbers.
2. **Language Goal:** Explain when a quotient might be best represented as a mixed number. **(Listening and Speaking)** ELPS 1.E, 2.E, 2.F

Connections and Coherence

Students continue to divide three-digit and four-digit dividends by one-digit and two-digit divisors that result in remainders. They use their understanding of equal sharing to divide the remainder based on the size of the divisor. This allows students to represent quotients as mixed numbers and interpret remainders as fractions. They recognize that any quotient resulting in a remainder can always be represented as a mixed number, although the context of a problem determines if it makes sense to do so. **(TEKS 5.1.G)**

Prior Learning

In Lesson 9, students practiced dividing three-digit and four-digit divisors by two-digit dividends, with and without remainders.

Future Learning

In Lesson 11, students will represent multi-step story problems using an equation with a letter standing in for the unknown quantity.

Depth and Rigor of Student Thinking

- Students build their **conceptual understanding** of how to divide a remainder and represent the quotient as a mixed number.
- Students continue to build **procedural skills** with multi-digit division by dividing four-digit dividends by one-digit and two-digit divisors with remainders.

Vocabulary

Review Vocabulary

mixed number

remainder

TEKS

Addressing

5.3.C

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Math Process Standards: 5.1.G

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

Building On

4.4.H

Building Math Identity

We are a math community.
How does working with a partner help your thinking in math class?

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

Lesson at a Glance

60 min

TEKS: 5.1.G, 5.3.C



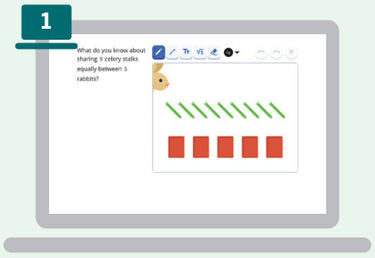
Why digital?

Students receive real-time feedback to gain an understanding of how to divide remainders based on the size of the divisor and to represent quotients as mixed numbers.

Warm-Up

Whole Class | 10 min

Students use the **What Do You Know About ____?** routine, which provides an opportunity for students to apply their prior knowledge about the relationship between fractions and division and prepares them to represent remainders as fractions in Activity 1.

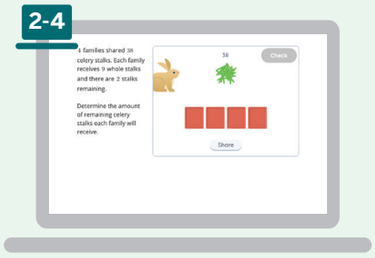


Activity 1

Pairs | 15 min

Students equally share remainders and represent the remainders as fractions. They discuss why it makes sense to divide the remainder and represent the quotient as a mixed number given the context of the problem.

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

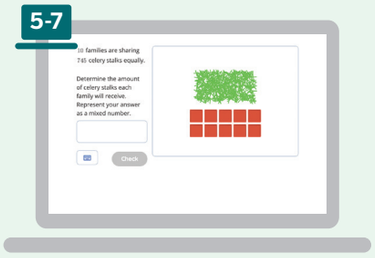


Activity 2 Fluency

Pairs | 20 min

Students use partial quotients to divide three-digit and four-digit dividends by two-digit divisors and represent quotients as mixed numbers. They notice the remainder can be represented as a fraction in which the numerator is the remainder and the denominator is the divisor.

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



Synthesis

Whole Class | 10 min

Students review and reflect on contexts in which it makes sense to divide remainders and when it does not make sense.

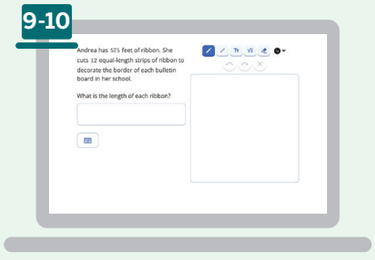


Show What You Know

Independent | 5 min

Students demonstrate their understanding by solving an equal-sharing situation involving a three-digit dividend and a two-digit divisor.

Students using print: *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.



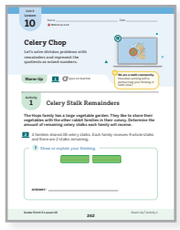
✓ Cognates ✓ Sentence frames and word bank

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.

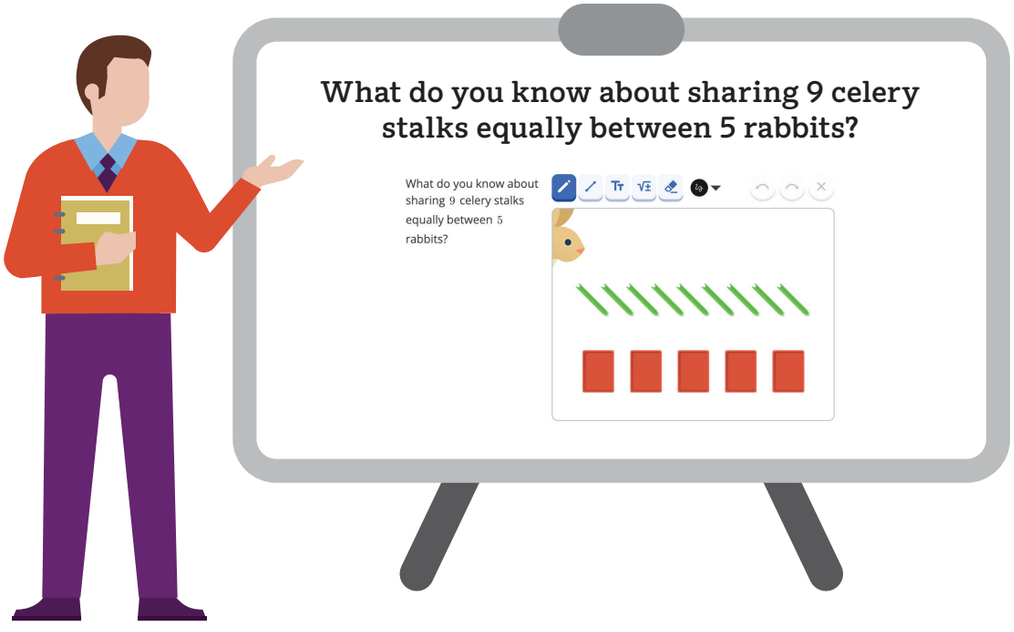
Whole Class | 10 min | Suggested Pacing: Screen 1

Students using print



Warm-Up What Do You Know About ___?

Purpose: Students share ideas about an equal-sharing situation in which there is a remainder to activate prior knowledge about the relationship between division and fractions and to prepare for representing remainders as fractions.





1 Launch

1 **Display** the question.

Use the What Do You Know About ___? routine.

Ask, "What do you know about sharing 9 celery stalks equally between 5 rabbits?"

Invite students to share their responses.

2 Connect

Record students' responses as they share.

Say, "Today, you will think about a new way to share equally when there is a remainder."

Students might say . . . ELPS 1.E, 2.C, 2.D, 2.F

If you divide 9 celery stalks into 5 groups, there will be 1 in each group and 4 left over.

Each rabbit would receive more than 1 celery stalk.

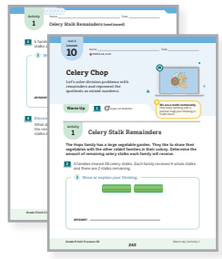
I know $9 \div 5 = \frac{9}{5}$ *or* $1\frac{4}{5}$ *celery stalks.*

Pairs | 15 min | Suggested Pacing: Screens 2-3, Screen 4

Activity 1 Celery Stalk Remainders

Purpose: Students equally share remainders to interpret them as fractional parts, preparing them to write quotients as mixed numbers in Activity 2.

Students using print



1 Launch



2 **Say**, "The Hops family has a large vegetable garden. They like to share their vegetables with the other rabbit families in their colony."

Read aloud the first part of Screen 2.

Play the animation. **ELPS 1.F**

Use the Think-Pair-Share routine. Ask, "Why is there a remainder of 2 celery stalks?"

Say, "Determine the amount of remaining celery stalks each family will receive with your partner."

Note: All students should have access to paper to represent their division.

2 Monitor



After students have completed **Screen 3**, refer to the D **Differentiation | Teacher Moves** table on the following page.

2-3 **If students need help getting started . . .**

- Ask, "How could you equally share the 38 celery stalks between 4 families?"
- Ask, "How many parts can you partition each whole into?"

A **Accessibility: Conceptual Processing** Clarify that when determining how many parts to partition each whole into, it is helpful to consider the divisor.

3 Connect



4 **Students using print:** Use the toggle to show each image so students can discuss Screen 4.

Ask:

- "What do you notice?"
- "Why does it make sense to divide the remainder and have a mixed number quotient for this problem?"

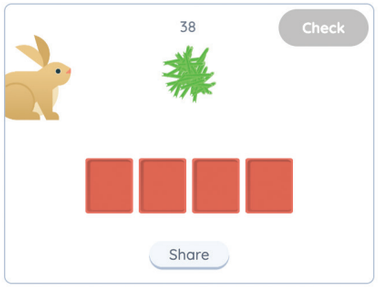
Key Takeaway: Say, "A remainder can be shared equally and represented as a fraction when the context lends itself to splitting up the remainder. In these cases, the quotient can be represented as a mixed number."

Students using digital

2

4 families shared 38 celery stalks. Each family receives 9 whole stalks and there are 2 stalks remaining.

Determine the amount of remaining celery stalks each family will receive.

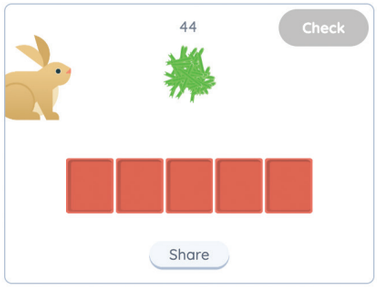


Students equally share the remaining celery stalks to represent the remainder as the fraction $\frac{1}{2}$.

3

5 families shared 44 celery stalks equally. Each family receives 8 whole stalks and there are 4 stalks remaining.

Determine the amount of remaining celery stalks each family will receive.

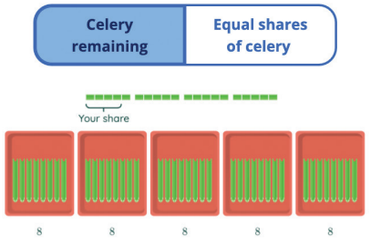


Students equally share the remaining celery stalks to represent the remainder as the fraction $\frac{4}{5}$.

4

Discuss

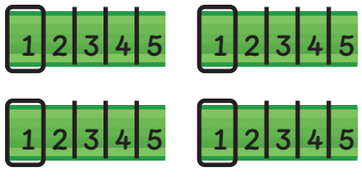
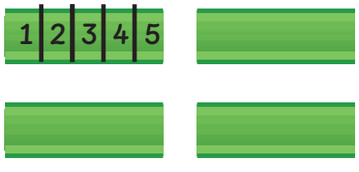
What do you notice? Why does it make sense to divide the remainder and have a mixed number for the total amount of celery stalks each family will receive?



Students may notice that the denominator, 5, is equal to the number of families, and the numerator, 4, is equal to the number of whole celery stalks remaining.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Equally share the remainder by partitioning each whole.	 Each family will get $\frac{4}{5}$ of the remaining celery stalk.	**Strengthen** Ask, "How could you determine the amount each family will receive without partitioning each whole?"
Equally share the remainder by partitioning 1 whole.	 Each whole can be split into fifths. There are 4 wholes, so each family will receive 4 groups of $\frac{1}{5}$ or $\frac{4}{5}$.	**Strengthen** Ask, "How does your thinking relate to the relationship between fractions and division?"
Use the relationship between fraction division and whole number division.	There are 4 wholes and 5 families, so each whole can be divided into fifths. $4 \div 5 = \frac{4}{5}$ or $\frac{4}{5}$ celery stalks.	**Stretch** Ask, "What is the total amount of celery each family would receive? How do you know?"

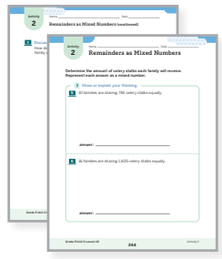
Pairs | 20 min | Suggested Pacing: Screens 5-7

Activity 2 Remainders as Mixed Numbers

Fluency

Purpose: Students use partial quotients to divide three-digit and four-digit dividends by two-digit divisors and represent the quotients as mixed numbers.

Students using print



1 Launch



5 **Read aloud** Screen 5. ELPS 1.E

Say, "Discuss your strategy for each problem with your partner."

Note: All students should have access to paper to represent their division.

2 Monitor



After students have completed **Screen 6**, refer to the D **Differentiation | Teacher Moves** table on the following page.

5-6 **If students need help getting started . . .**

- Ask, "How is this similar to the problems you solved in Activity 1? How could you use what you did in Activity 1 to get started?"
- Ask, "Which value represents the dividend? Which value represents the divisor? How could you divide these 2 numbers?"

3 Connect



7 **Ask:**

- "How did you determine what fraction of the remainder each family would receive?"
- "What do you notice about the numerator and denominator?"

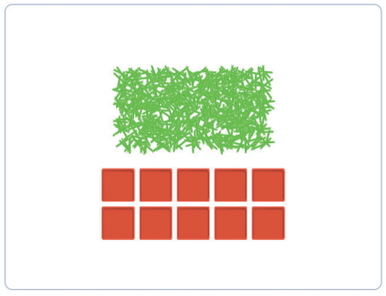
Key Takeaway: Say, "You can share a remainder equally by dividing the remainder by the divisor. You can represent this as a fraction with the remainder as the numerator and the divisor as the denominator."

Students using digital

5

10 families are sharing 745 celery stalks equally.

Determine the amount of celery stalks each family will receive. Represent your answer as a mixed number.



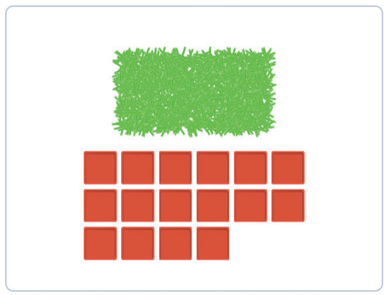
Check

Students equally share 745 celery stalks between 10 families and write the quotient as the mixed number $74\frac{5}{10}$ or equivalent.

6

16 families are sharing 1,605 celery stalks.

Determine the amount of celery stalks each family will receive. Represent your answer as a mixed number.



Check

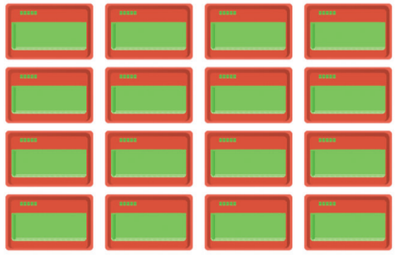
Students equally share 1,605 celery stalks between 16 families and write the quotient as the mixed number $100\frac{5}{16}$.

7

Discuss

How did you determine what fraction of the remainder each family would receive?

$1605 \div 16 = 100\frac{5}{16}$



Students may explain that they knew the remainder would be $\frac{5}{16}$ because the 5 remaining celery stalks are divided among the 16 families.

Students using print will arrive at similar answers.

D Differentiation | Teacher Moves

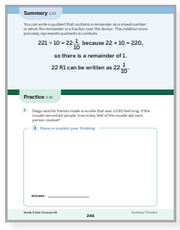
Look for students who . . .	For example . . .	Provide support . . .
Almost there Represent the amount each family would receive as a mixed number with the dividend as the denominator.	$100\frac{5}{1,605}$ celery stalks	**Support** Ask, "How many families are sharing the 5 remaining stalks? How could you represent this as a fraction?"
Almost there Represent the amount each family would receive as a mixed number with the whole number part of the quotient as the denominator.	$100\frac{5}{100}$ celery stalks	
Represent the amount each family would receive as a mixed number with the divisor as the denominator.	$100\frac{5}{16}$ celery stalks	**Strengthen** Ask, "What do you notice about the numerator and denominator when you equally share the remainder?"

Whole Class | 10 min | Suggested Pacing: Screen 8

Synthesis

Lesson Takeaway: A quotient that contains a remainder can be written as a mixed number. When it makes sense in context to equally divide the remainder, this is a more precise way to represent the quotient.

Students using print





8 **Ask:**

- "In what contexts does it make sense to divide the remainder?"
- "In what contexts does it not make sense to divide the remainder?"

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.B, 2.D, 2.F

Say, "When solving story problems, the context determines whether or not the remainder should be shared equally. If the item being shared cannot be split into smaller parts, the remainder should not be divided. If the item being shared can be split into smaller parts, the remainder can be divided."

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

Show What You Know

Independent | 5 min

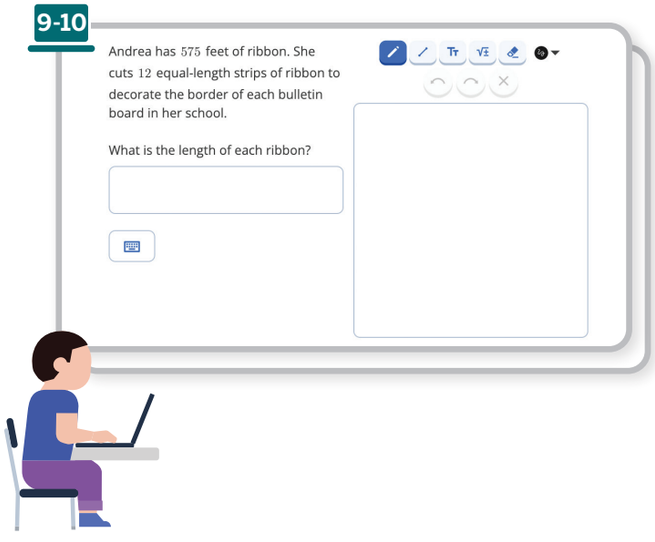
Suggested Pacing: Screens 9-10

Students using print

(Show What You Know PDF)



Students using digital



Today's Goals

1. **Goal:** Use partial quotients to divide three-digit and four-digit dividends by one-digit and two-digit divisors with remainders and rename quotients as mixed numbers.
   - In the *Show What You Know*, students solved a real-world problem involving a three-digit dividend and a two-digit divisor and named the quotient as a mixed number.
2. **Language Goal:** Explain when a quotient might be best represented as a mixed number. **(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 10
Practice

Students using digital

Students using print

Summary 3.10

You can write a quotient that contains a remainder as a mixed number in which the remainder is a fraction over the divisor. This notation more precisely represents quotients in contexts.

$221 \div 10 = 22\frac{1}{10}$ because $22 \times 10 = 220$, so there is a remainder of 1.

22 R1 can be written as $22\frac{1}{10}$.

Practice 3.10

1 Diego and his friends made a noodle that was 1,040 feet long. If the noodle served 64 people, how many feet of the noodle did each person receive? Sample work shown.

Show or explain your thinking.

$$\begin{array}{r} 16 \\ 64\overline{)1040} \\ -\ 64 \\ \hline 400 \\ -\ 384 \\ \hline 16 \end{array}$$

or

$$\frac{640}{64} + \frac{384}{64} + \frac{16}{64} =$$
$$10 + 6 + \frac{16}{64}$$
$$10 + 6 + \frac{1}{4}$$
$$16\frac{16}{64} = 16\frac{1}{4}$$

$16\frac{16}{64} = 16\frac{1}{4}$

answer: $16\frac{1}{4}$ feet or equivalent

Practice 3.10

Name _____ Date _____

2 Clare and her friends made a noodle that was 750 feet long. If the noodle served 36 people, how many feet of the noodle did each person receive?

Show or explain your thinking.

Sample work shown.

$$\begin{array}{r} 20 \\ 36\overline{)750} \\ -720 \\ \hline 30 \end{array}$$

answer: $20\frac{30}{36}$ feet or equivalent

3 Han and his friends made a noodle that was 1,284 feet long. If the noodle served 96 people, how many feet of the noodle did each person receive?

Show or explain your thinking.

Sample work shown. $\frac{960}{96} + \frac{288}{96} + \frac{36}{96} =$

$$10 + 3 + \frac{36}{96}$$
$$10 + 3 + \frac{3}{8}$$
$$13\frac{36}{96} = 13\frac{3}{8}$$

answer: $13\frac{3}{8}$ feet or equivalent

Practice 3.10

Name _____ Date _____

4 Jada evaluated the expression 386 ÷ 12. Her work is shown. Write the quotient as a mixed number.

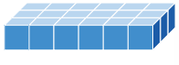
$32\frac{2}{12}$ or $32\frac{1}{6}$

Jada's work

$$\begin{array}{r} 32 \\ 12\overline{)386} \\ -36 \\ \hline 26 \\ -\ 24 \\ \hline 2 \end{array}$$

Spiral Review

5 The figure shows the base of a rectangular prism. There are 5 layers identical to the base layer. If each block has a volume of 1 cubic unit, what is the volume of the rectangular prism?



(A) 30 cubic units
(B) 18 cubic units
(C) 108 cubic units
(D) 90 cubic units

For Problems 6 and 7, determine the value of the expression.

Show your thinking. Sample work shown.

6 $[36 - (5 + 3)] \times 25$

$[36 - (5 + 3)] \times 25$
$[36 - 8] \times 25$
28×25

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 28 \\ \times\ 25 \\ \hline 140 \\ +\ 560 \\ \hline 700 \end{array}$$

answer: 700

7 $[42 + (3 \times 2)] \div 8$

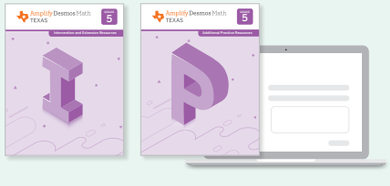
$[42 + (3 \times 2)] \div 8$
$[42 + 6] \div 8$
$48 \div 8$
$= 6$

answer: 6

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
Fluency	1–3	2	5.3.C
Fluency	4	1	5.3.C
Spiral Review			
Test Practice	5	1	5.6.B
Fluency	6, 7	1	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 10

Lesson Goal: Use partial quotients to divide three-digit and four-digit dividends by one-digit and two-digit divisors with remainders and rename quotients as mixed numbers.

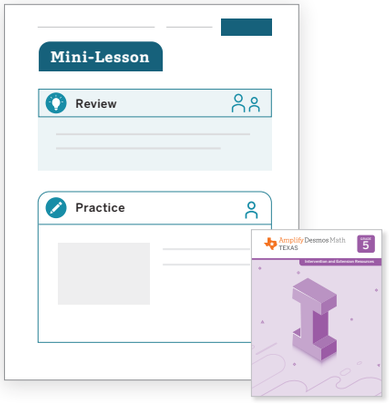
Support

Provide targeted intervention for students by using these resources.

If students represent the mixed number with the dividend as the denominator:

Respond:

- Assign the *Solving Division Story Problems and Interpreting Answers* Mini-Lesson. | 15 min
- Revisit Lesson 9.



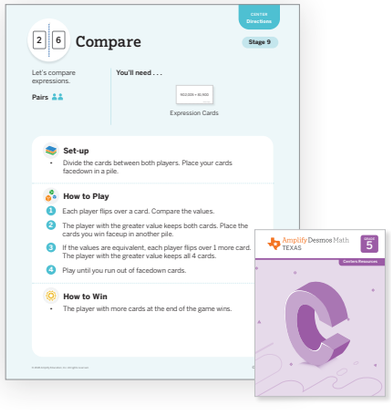
Strengthen

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

If students equally share the remainder based on the size of the divisor:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
  Watch Your Remainder:
  - ***One-Digit Divisors***
  - ***Two-Digit Divisors***
- Have students complete **Lesson 10 Practice**. | 15 min
- **Item Bank**



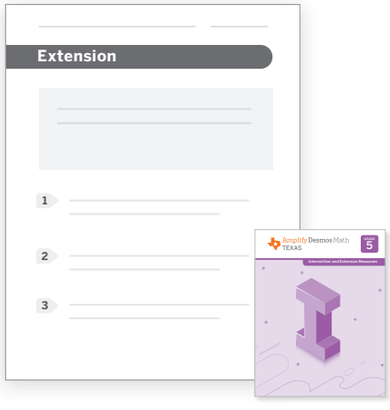
Stretch

Challenge students and extend their learning with these resources.

If students use the relationship between fraction and whole-number division:

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

What opportunities are you giving students to reflect on their understanding of the mathematical content?

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

Problem	Concept or skill	DOK	TEKS
1	Determining whole number quotients of up to four-digit dividends and two-digit divisors	1	5.3.C *(S)*
2	Interpreting the remainder of a four-digit dividend and two-digit divisor	2	5.3.C *(S)*
3	Estimating quotients of multi-digit numbers	2	5.3.A *(S)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources includes:
- 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*

Name _____ Date _____

Quiz: Sub-Unit 2 Unit 5.3

1 Calculate the quotient of 966 ÷ 23 using the standard algorithm.

Show your thinking.

Sample work shown.

$$\begin{array}{r} 2 \\ 40 \\ 23\overline{)966} \\ -\,920 \\ \hline 46 \\ -\,46 \\ \hline 0 \end{array}$$

40 + 2 = 42

answer: 42

2 A school is organizing a field trip and needs to transport students using buses. 48 students will ride on each bus. There are 1,356 students going on the trip. How many buses are needed to transport all students?

A. 30 buses
B. 29 buses
C. 28 buses
D. 65,088 buses

3 A bookstore has 2,105 books that need to go on shelves. Each shelf can hold 28 books. Which of the following is the most reasonable estimate for the number of shelves needed?

A. 70 shelves
B. 60,000 shelves
C. 60 shelves
D. 65 shelves

83

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Digital

Unit 3
Quiz: Sub-Unit 2

D Differentiation (Quiz: Sub-Unit 2)

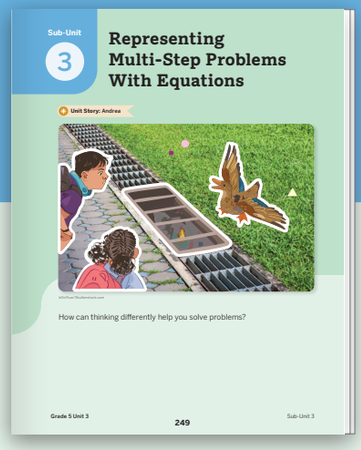
To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goal	Problem	Respond to Student Thinking
Sub-Unit 2: Divide multi-digit whole numbers using strategies based on place value and the relationship between multiplication and division.	1	**Support** • **Mini-Lesson:** *Dividing Three-Digit Dividends by Two-Digit Divisors Without Remainders* (ML 3.07) • **Center:** *Watch Your Remainder: Two-Digit Divisors*
	2	**Support** • **Mini-Lesson:** *Solving Division Story Problems and Interpreting Answers* (ML 3.10) • **Teacher Move:** Have students review the problem. Provide another opportunity for students to interpret the remainder.
	3	**Support** • **Mini-Lesson:** *Using Partial Quotients To Divide By Place* (ML 3.08) • **Teacher Move:** Have students review the problem. Provide another opportunity for students to estimate the quotient.

Notes:

Sub-Unit 3

Representing Multi-Step Problems With Equations



Sub-Unit 3 Goals

- Represent and solve multi-step story problems by identifying and writing equations with a letter standing for the unknown.
- Interpret and compare written numerical equations without evaluating them.

Progression of TEKS in Sub-Unit 3

- **Lessons 11–12:** Students analyze story problems to determine which equations with a letter standing for the unknown accurately represent story problems. They then solve multi-step story problems by writing equations with a letter standing for the unknown. Students include grouping symbols, including parentheses and brackets.
- **Lesson 13:** Students reason about the size of the unknown quantity to compare expressions without evaluating. They use their understanding of the 4 operations to compare expressions using <, >, and =.

Sub-Unit 3 Progression	Lesson 11	Lesson 12	Lesson 13
Algebraic reasoning			
TEKS 5.4.B	●	●	●
TEKS 5.4.F	○	●	○

Coming up Next

- **Sub-Unit 4, Lessons 14–17:**
  - » Number and operations: **TEKS 5.3.B**
  - » Personal financial literacy: **TEKS 5.10.A, 5.10.B, 5.10.C, 5.10.D, 5.10.E, 5.10.F**

Math That Matters Most

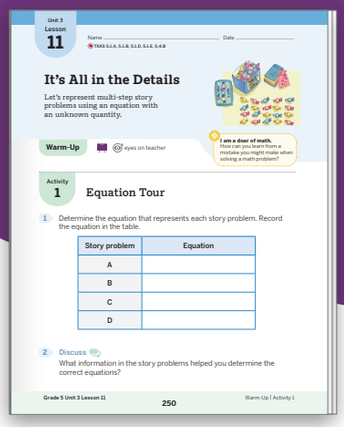
Sub-Unit 3: Use understanding of the 4 operations and grouping symbols to represent and solve multi-step word problems with a letter standing for the unknown.

Progression of Strategies, Skills, or Language

Progression	For example . . .
Representing multi-step story problems with whole numbers using equations with a letter standing for the unknown.	Shawn bought some baseball cards. • 2 of the packs have 15 baseball cards in each pack. • 5 of the packs have 12 baseball cards in each pack. • Shawn split all of the cards equally into 3 binders. What equation can be used to determine c, the number of baseball cards Shawn put in each binder? $c = [(2 \times 15) + (5 \times 12)] \div 3$
Solving a multi-step story problem involving multiplication and division and writing an equation using parentheses to represent the story problem.	A school orders the same number of pencils for each of the 11 months that students are in school. Each month, 848 pencils are equally shared among 16 classrooms. How many pencils does each classroom receive for the months that they are in school? 3 10] 53 40 16) 848 −640 208 −160 48 −48 0 $53 \times 10 = 530$ $53 \times 1 = 53$ $53 \times 11 = 583$
Interpreting and comparing numerical and written expressions, without evaluating them, using properties of operations.	$3 \times (18{,}932 + 921) < (18{,}932 + 921) \times 5$ *The sum of the numbers in the parentheses is the same.* *5 groups of that amount is greater than 3 groups of that amount.*

Unit 3
Lesson
11

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



It's All in the Details

Representing Multi-Step Story Problems With Equations Using a Letter Standing for the Unknown Quantity

Let's represent multi-step story problems using an equation with an unknown quantity.

Key Concepts

Today's Goals

1. **Goal:** Represent multi-step story problems with whole numbers using equations with a letter standing for the unknown quantity.
2. **Language Goal:** Justify why an equation matches a story problem. **(Listening, Speaking, Reading, and Writing)** ELPS 1.E, 2.E, 2.F, 3.H, 4.D, 4.F

Connections and Coherence

This is the first of two lessons in which students write equations with a letter standing for the unknown quantity to represent multi-step story problems. In today's lesson, they read and analyze story problems to identify the equation that accurately represents each story problem. Students use key information within the story problems to formulate a plan for solving, which is communicated through equations that can be used to solve for the unknown quantity. **(TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.E)**

Prior Learning

In Grade 5, Unit 1, Lesson 13, students used their understanding of the order of operations to describe the meaning of parentheses and brackets in numeric expressions.

Future Learning

In Lesson 12, students will represent multi-step story problems using equations with a letter standing for the unknown and solve for the unknown quantity.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of representing multi-step story problems using equations with a letter standing for the unknown quantity.

Vocabulary

Review Vocabulary

brackets

order of operations

parentheses

TEKS

Addressing

5.4.B

Represent and solve **multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.**

Math Process Standards: 5.1.A, 5.1.B, 5.1.C, 5.1.D, 5.1.E

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

Building On

5.4.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.

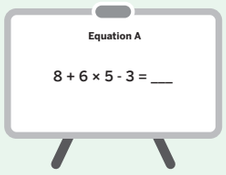
Lesson at a Glance 60 min

TEKS: 5.1.A, 5.1.B, 5.1.C, 5.1.D, 5.1.E, 5.4.B

Warm-Up Fluency

Whole Class | 10 min

Students use the **Number Talk** routine to demonstrate their understanding of and strategies for analyzing and evaluating equations. This prepares them to explore the relationship between numbers and words in equations and multi-step story problems in Activity 1. **(TEKS 5.1.C)**



Activity 1

Small Groups | 15 min

Students move around the room to read and analyze multi-step story problems and identify the equations that represent them.

Materials: Activity 1 PDF, chart paper, markers, *Words and Phrases in Story Problems* chart (teacher made)

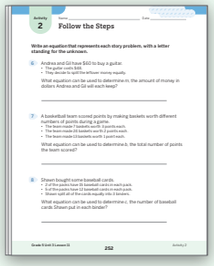


Activity 2

Pairs | 20 min

Students build on their work from Activity 1 by reading and analyzing multi-step story problems to represent them using equations with a letter standing for the unknown.

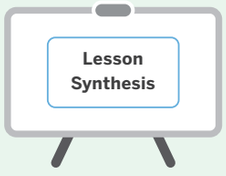
Materials: *Words and Phrases in Story Problems* chart (from Activity 1)



Synthesis

Whole Class | 10 min

Students review and reflect on how using the language within a story problem to place parentheses, brackets, and operations throughout equations can affect the accuracy of equations that represent multi-step story problems.

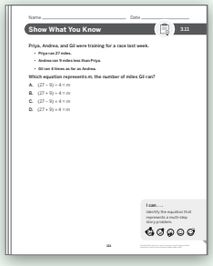


Show What You Know

Independent | 5 min

Students demonstrate their understanding by identifying the equation that represents a multi-step story problem.

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, 3.C, 3.F, 3.G, 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 and **read** English. They **speak** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** and **write** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** and **write** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** and **write** using longer sentences. Exemplar responses are provided.

Whole Class | 10 min

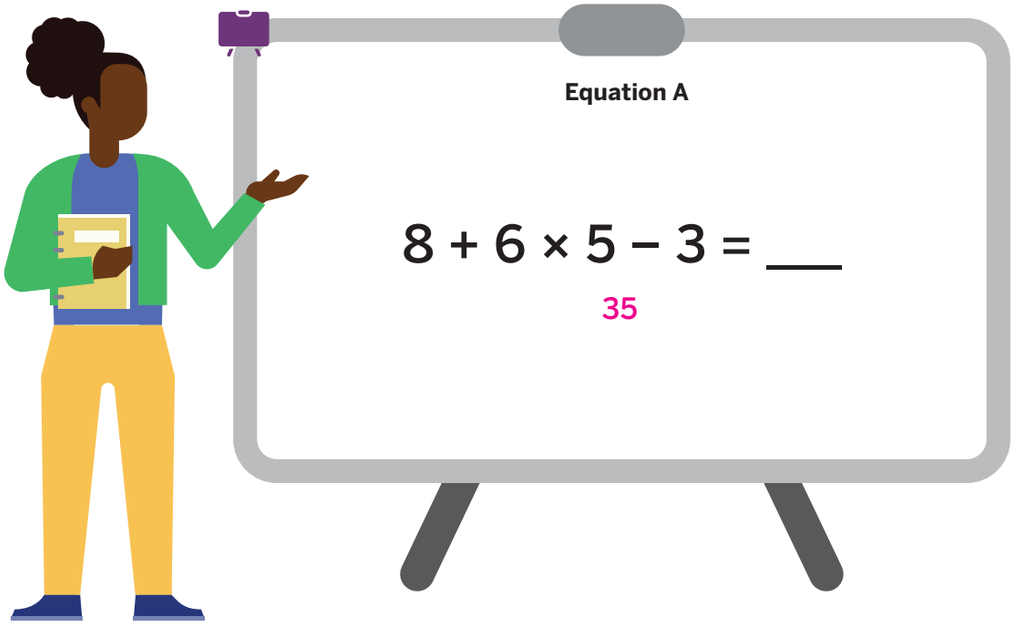
Presentation Screen



Warm-Up Number Talk

Fluency

Purpose: Students determine the value of equations to make connections between the structure of each equation and its value.



Equation B

$8 + 6 \times (5 - 3) =$ ___

20

Equation C

$(8 + 6) \times 5 - 3 =$ ___

67

Equation D

$[8 + (6 \times 5)] - 3 =$ ___

35

Why these problems? These equations lend themselves to prompting students to review the order of operations and grouping symbols in equations.

1 Launch

Use the Number Talk routine.

Display 1 equation 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 answers and 2 or 3 strategies as students share, honoring all strategies and keeping equations and work displayed.

Repeat with each equation, spending the most time discussing Equations B and D.

Use the Think-Pair-Share routine. Ask, "Why are the values of Equations A and D the same?"

Say, "You will use your understanding of the order of operations and grouping symbols throughout today's lesson."



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

A: *I know it is 35 because multiplication occurs first, then addition, and then subtraction.*

B: *The value of this equation is 20.*

C: *The value is 67. You must solve the addition first because it is in parentheses.*

D: *Everything inside the brackets needs to be simplified first, starting with 6 × 5. The answer is 35.*

Small Groups | 15 min

Activity 1 Equation Tour

Purpose: Students identify equations with a letter standing in for the unknown that represent story problems to prepare for work in Activity 2.

Presentation Screens



Materials

Lesson Resources:

- Display the Activity 1 PDF around the room during the Launch.

Classroom materials:

- Use chart paper and markers to prepare the *Words and Phrases in Story Problems* chart before the Activity. Display the Words and Phrases in Story Problems chart during the Connect.

Short on time? Consider omitting Problem 3.

1 Launch



Say, "You will move around the room in small groups to read and analyze story problems. As a group, you will determine which equation represents each story problem. Once you have completed the table in Problem 1, complete Problem 2."

EB **Emergent Bilinguals** Encourage students to use gestures or hand motions to help them describe what is happening mathematically in the story problems. ELPS 1.B, 1.E

2 Monitor



While students complete **Problem 4**, 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, "How should the numbers and operations be grouped together to match the story problem?"

EB **Emergent Bilinguals** As students respond to Problem 5, invite them to write their response for the specific purpose of justifying their choice using supporting details. Encourage them to use transition words, such as *because, first, then, and finally*. Consider asking, "Will you capitalize any words in your response? Why or why not? Will you end your sentences with a period or a question mark? Why? What evidence can you include?" ELPS 4.D, 4.F

3 Connect



Invite students to take turns sharing their response to Problem 4.

Use the Think-Pair-Share routine. Ask, "Which words or phrases in the story problem helped you to determine which operations must be represented in the matching equation?"

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

- Collect student language used to explain how to write equations, such as *split*, *share equally*, or *as many times as*.
- Add the language students use to the chart paper titled *Words and Phrases in Story Problems*, and remind them to continue to refer to and use the display while writing equations that represent multi-step story problems.

Key Takeaway: Say, "In order for an equation to accurately represent a story problem, it is important that the equation matches what is happening in the story. You can use the language from the problem to identify the operations to use within the equation."

Student Edition

Unit 3
Lesson
11

Name _____ Date _____

TEKS 5.1.A, 5.1.B, 5.1.D, 5.1.E, 5.4.B

It's All in the Details

Let's represent multi-step story problems using an equation with an unknown quantity.



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 Equation Tour

1 Determine the equation that represents each story problem. Record the equation in the table.

Story problem	Equation
A	$(2 \times 12) + (3 \times 25) = p$
B	$m = (40 - 26) \div 2$
C	$2(34 + 17) = y$
D	$j = [735 - (9 \times 65)] \div 5$

2 Discuss Oral activity: No writing expected.
What information in the story problems helped you determine the correct equations?

Activity 1

Name _____ Date _____

Equation Tour (continued)

3 Andrea has 190 pieces of saltwater taffy to give to her friends.
- She gave 20 pieces to Gil.
- She put the rest of the taffy into bags, with 12 pieces of taffy in each bag.

Which equation can be used to determine b, the number of bags of taffy Andrea made?

(A) $b = (190 + 20) + 12$ (B) $b = (190 - 20) - 12$
(C) $b = (190 + 20) - 12$ (D) $b = (190 - 20) \div 12$

4 Clare spent $56 at the book fair.
- She spent $12 on a poster.
- She bought 5 pens for $3 each.
- Then she spent the rest of the money on books.

Which equation can be used to determine m, the amount of money Clare spent on books?

(A) $m = 56 - 12 + 5 \times 3$ (B) $m = 56 - 12 + (5 \times 3)$
(C) $m = 56 - [12 + (5 \times 3)]$ (D) $m = 56 + (12 + 5) \times 3$

5 Justify your answer choice for Problem 4. Sample response shown.

I chose Equation C because I know that I need to first determine how much the pens cost. Then I need to add that to the poster cost. Finally, I will subtract that sum from 56.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Determine that equations in Choices A, B, or D represent the story problem.	$m = 56 - 12 + 5 \times 3$	**Support** Ask, "What strategy can you use to determine the relationship between the numbers in the story problem? How does that help you determine the equation that represents the story?"
Determine that the equation in Choice C represents the story problem.	$m = 56 - [12 + (5 \times 3)]$	**Stretch** Ask, "How would the equation change if the student also bought 3 packs of stickers that cost $4 each?"

Pairs | 20 min

Activity 2 Follow The Steps

Purpose: Students represent multi-step story problems by writing equations with a letter standing for the unknown to demonstrate an understanding of real-world problems.

Presentation Screens



Materials

Classroom materials:

- Display and reference the *Words and Phrases in Story Problems* chart during the Activity.

1 Launch



Say, "Work with your partner to complete Problems 6–8."

Have students pause for discussion after completing Problem 8.

Use the Think-Pair-Share routine. Ask:

- "How did you determine which operations to include in your equations?"
- "How did you determine where to place parentheses and/or brackets in your equations?"

Say, "Complete Problems 9–12 independently."

A **Accessibility: Fine motor skills** Provide students with a pre- or partially-completed equation for Problems 9–12.

2 Monitor



While students complete **Problem 6**, 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 story problem?"
- Ask, "How can you use what you know about the order of operations, parentheses, and brackets to write an equation that represents the story problem?"

EB **Emergent Bilinguals** As students respond to Problem 12, invite them to write their response for the specific purpose of defending their equation. Encourage them to use transition words, such as *because*. **ELPS 4.D, 4.F**

3 Connect



Invite students to share their responses and strategies from Problem 12.

Use the Think-Pair-Share routine. Ask:

- "Why is it important to use parentheses and brackets when writing equations that represent story problems?"
- "What strategies did you use to determine what operations and grouping symbols to include in your equation?"

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

- If a student says, "The matching equation must include parentheses . . ."
- Press for details by asking, "Which numbers will be grouped together? How did you know to group them? What operation will go inside the parentheses? What words or phrases helped you determine the correct operation?"

Key Takeaway: Say, "When representing a story problem using an equation with a letter standing for the unknown, it is important to indicate which operation needs to be performed first. You can use parentheses and brackets to accurately show the order."

Student Edition

Activity 2

Name _____ Date _____

Follow the Steps

Write an equation that represents each story problem, with a letter standing for the unknown. Sample responses shown.

6 Andrea and Gil have $60 to buy a guitar.
- The guitar costs $48.
- They decide to split the leftover money equally.

What equation can be used to determine *m*, the amount of money in dollars Andrea and Gil will each keep?

m = (60 − 48) ÷ 2

7 A basketball team scored points by making baskets worth different numbers of points during a game.
- The team made 7 baskets worth 3 points each.
- The team made 24 baskets worth 2 points each.
- The team made 13 baskets worth 1 point each.

What equation can be used to determine *b*, the total number of points the team scored?

b = 7(3) + 24(2) + 13

8 Shawn bought some baseball cards.
- 2 of the packs have 15 baseball cards in each pack.
- 5 of the packs have 12 baseball cards in each pack.
- Shawn split all of the cards equally into 3 binders.

What equation can be used to determine *c*, the number of baseball cards Shawn put in each binder?

c = [(2 × 15) + (5 × 12)] ÷ 3

Activity 2

Name _____ Date _____

Follow the Steps (continued)

9 At a fair, a family spent $125. They spent $36 on food and $54 on rides. They spent the rest of the money on games. What equation can be used to determine *g*, the amount of money in dollars the family spent on games?

125 − (36 + 54) = *g*

10 A school purchased 90 boxes of pizza. Each box had 8 slices of pizza. Teachers put 2 slices of pizza onto each plate to give to students. What equation can be used to determine *p*, the number of plates the teachers filled with pizza?

(90 × 8) ÷ 2 = *p*

11 Priya is training for a bike race. On Monday, she biked 25 miles. On Tuesday, she biked 13 miles less than Monday. On Wednesday, she biked 3 times as far as Tuesday. What equation can be used to determine *b*, the number of miles Priya biked on Wednesday?

(25 − 13) × 3 = *b*

12 Explain why your equation for Problem 11 represents the story problem. Sample response shown.

It represents the story problem because first I need to determine how many miles Priya rode on Tuesday by subtracting 13 from 25. Then I will multiply the difference by 3 because she rode 3 times as many miles on Wednesday than on Tuesday.

Presentation Screens

D Differentiation | Teacher Moves

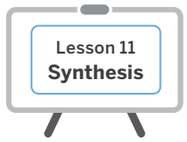
Look for students who . . .	For example . . .	Provide support . . .
Almost there Write an equation that partially represents the story problem.	*m* = 60 − 48 × 2 **or** *m* = 60 − 48 ÷ 2	**Support** "Which words and phrases in the story problem helped you determine which operations to include in your equation?"
Write an equation that represents the story problem.	*m* = (60 − 48) ÷ 2	**Stretch** "How would your equation change if Andrea and Gil buy guitar picks for $2?"

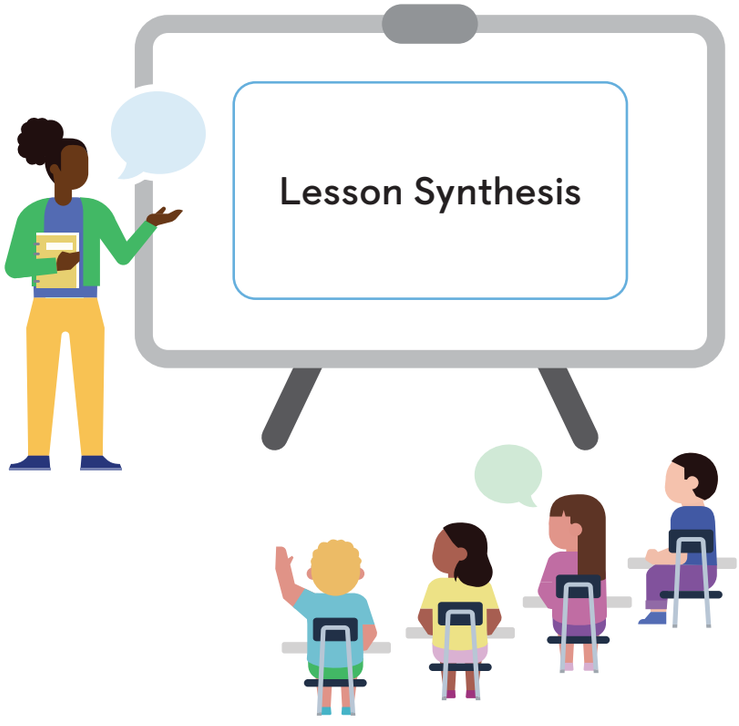
Whole Class | 10 min

Synthesis

Lesson Takeaway: Multi-step story problems can be represented with equations that include a letter for the unknown quantity

Presentation Screens





Use the Think-Pair-Share routine. Ask, "Does the equation represent the story problem? Why or why not?"

Ask (if not yet mentioned during discussion), "Is there another equation that could be used to represent this problem? How do you know?"

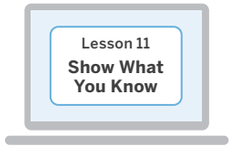
Say, "Equations with a letter standing for the unknown can be used to represent story problems. When you write equations, you should think carefully about the details of the story problems."

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

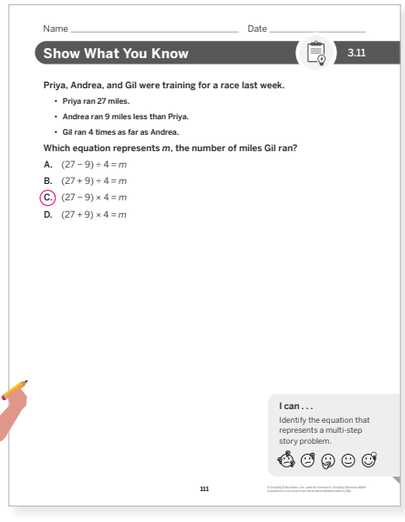
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.11

Priya, Andrea, and Gil were training for a race last week.

- Priya ran 27 miles.
- Andrea ran 9 miles less than Priya.
- Gil ran 4 times as far as Andrea.

Which equation represents m, the number of miles Gil ran?

A. $(27 - 9) \div 4 = m$
B. $(27 + 9) \div 4 = m$
C. $(27 - 9) \times 4 = m$
D. $(27 + 9) \times 4 = m$

I can . . .
Identify the equation that represents a multi-step story problem.

111

Today's Goals

1. **Goal:** Represent multi-step story problems with whole numbers using equations with a letter standing for the unknown quantity.
   - In the *Show What You Know*, students identified the equation, with a letter standing for the unknown quantity, that represented a multi-step story problem.
2. **Language Goal:** Justify why an equation matches a story problem. **(Listening, Speaking, Reading, and Writing)**
   ELPS 1.E, 2.E, 2.F, 3.H, 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 11
Practice

Students using digital

Students using print

Summary 3.11

Multi-step story problems can be represented with equations that include a letter for the unknown quantity.

A basketball team scored points by making baskets worth different numbers of points during a game.

- The team made 4 baskets worth 3 points each.
- The team made 20 baskets worth 2 points each.
- The team made 15 baskets worth 1 point each.

Write an equation that represents p, the total number of points the team scored during the game.

$p = 4(3) + 20(2) + 15$

Practice 3.11

1 At a grocery store, a customer bought 24 red apples and 36 green apples. The customer divided the apples equally into 5 boxes. Write an equation that represents a, the number of apples the customer put into each box. **Sample response shown.**

$(24 + 36) \div 5 = a$

2 A bakery earned $193 from selling cakes. They sold 7 vanilla cakes for $15 each and chocolate cakes for $11 each. Write an equation that represents c, the number of chocolate cakes the bakery sold.

Sample response shown.

$[193 - (7 \times 15)] \div 11 = c$

Grade 5 Unit 3 Lesson 11 254 Summary | Practice

Practice 3.11

Name _____ Date _____

3 An art teacher put 35 pencils in the pencil bin at the beginning of the day.

- 3 pencils were taken from the bin during each of the first 5 classes of the day.
- 2 pencils were taken from the bin during the last 2 classes of the day.
- The teacher found 12 pencils on the floor at the end of the day and put them in the bin.

Which equation can be used to determine p, the number of pencils that were in the bin at the end of the day?

(A) $p = 35 - (3 + 5) - (2 + 2) + 12$ (B) $p = 35 - (3 \times 5) - (2 \times 2) + 12$
(C) $p = 35 - (3 \times 5) - (2 \times 2) - 12$ (D) $p = 35 - (3 + 5) - (2 + 2) - 12$

4 The school held a bake sale.

- 6 slices of cake were sold for $4 each.
- 25 cupcakes were sold for $3 each.
- 14 cookies were sold for $2 each.

Which equation can be used to solve for d, the amount of money in dollars the school made?

(A) $d = 6(4) + 25(3) + 14(2)$ (B) $d = (6 + 4) \times (25 + 3) \times (14 \times 2)$
(C) $d = (6 + 4) + 25(3) + 14(2)$ (D) $d = (6 \times 4) + (25 + 3) \times (14 + 2)$

5 An art teacher ordered 35 boxes of paint. Each box contained 24 bottles of paint. She had 7 new bottles of paint in the closet, and she gave 12 of the new bottles to another teacher.

Which equation can be used to determine p, the number of bottles of paint the art teacher has?

(A) $p = [(35 \times 24) - 7] + 12$ (B) $p = [(35 \times 24) + 7] - 12$
(C) $p = [(35 - 24) + 7] - 12$ (D) $p = 12 + 7 + 35 \times 24$

Grade 5 Unit 3 Lesson 11 255 Practice

Practice 3.11

Name _____ Date _____

Spiral Review

For Problems 6–9, simplify the expression. Sample work shown.

Show your thinking.

6 $(8 \times 8) - 2(12 \div 3)$

$64 - 2(4)$
$64 - 8$

answer: 56

7 $14 + [(5 \times 6) \div 2]$

$14 + [30 \div 2]$
$14 + 15$

answer: 29

8 $[9(3.50 + 4.50) - 23] \div 7$

$[9(8) - 23] \div 7$
$[72 - 23] \div 7$
$49 \div 7$

answer: 7

9 $3(15) + 4(21) - 5(7)$

$45 + 84 - 35$
$129 - 35$

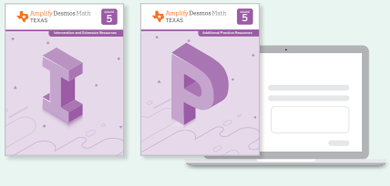
answer: 94

Grade 5 Unit 3 Lesson 11 256 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–3	2	5.4.B
Test Practice	4	2	5.4.B
	5	2	5.4.B
Spiral Review			
Fluency	6–9	1	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 11

Lesson Goal: Represent multi-step story problems with whole numbers using equations with a letter standing for the unknown quantity.

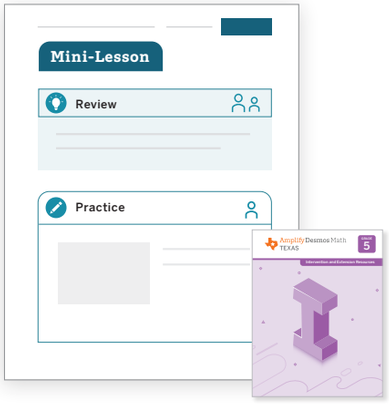
Support

Provide targeted intervention for students by using these resources.

If students select answer option B:

Respond:

- Assign the *Selecting Equations With Parentheses to Represent Multi-Step Story Problems* Mini-Lesson. | 15 min
- Review the order of operations and the meaning of parentheses and brackets.
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



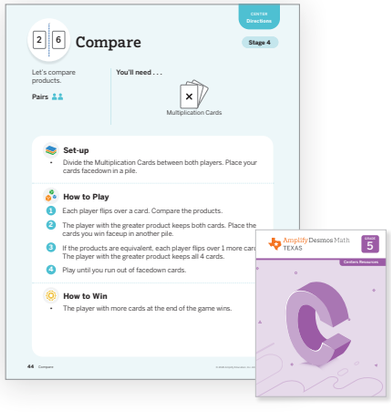
Strengthen

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

If students select an answer that partially represents the story problem:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
  Watch Your Remainder:
  - *One-Digit Divisors*
  - *Two-Digit Divisors*
- Have students complete **Lesson 11 Practice.** | 15 min
- **Item Bank**



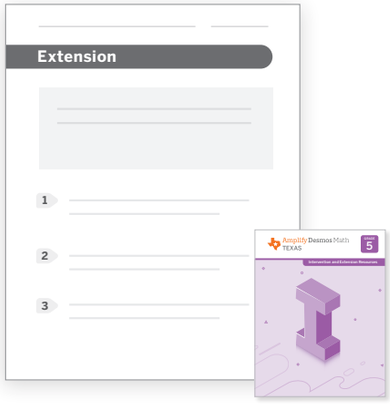
Stretch

Challenge students and extend their learning with these resources.

If students select an answer that represents all parts of the story problem:

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., *brackets/soportes*
- Frayer Model templates
- Vocabulary routines





Professional Learning

What representations do you anticipate students making in the next lesson? Why do you think they will choose these representations?

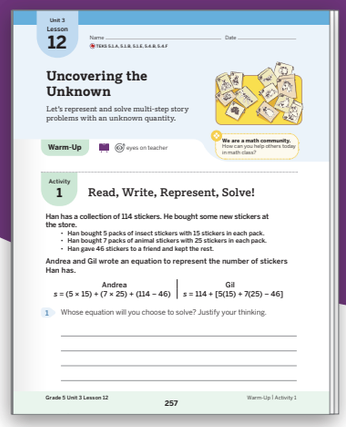
Unit 3
Lesson
12

Uncovering the Unknown

Solving Multi-Step Story Problems With Equations Using a Letter Standing for the Unknown Quantity

Let's represent and solve multi-step story problems with an unknown quantity.

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


Unit 3
Lesson
12

Name _____ Date _____

Uncovering the Unknown

Let's represent and solve multi-step story problems with an unknown quantity.

Warm-Up eyes on teacher

We are a math community. How can you help others today in math class?

Activity 1 Read, Write, Represent, Solve!

Han has a collection of 114 stickers. He bought some new stickers at the store.
- Han bought 5 packs of insect stickers with 15 stickers in each pack.
- Han bought 7 packs of animal stickers with 25 stickers in each pack.
- Han gave 46 stickers to a friend and kept the rest.

Andrea and Gil wrote an equation to represent the number of stickers Han has.

Andrea: $s = (5 \times 15) + (7 \times 25) + (114 - 46)$ | Gil: $s = 114 + [5(15) + 7(25) - 46]$

1 Whose equation will you choose to solve? Justify your thinking.

Grade 5 Unit 3 Lesson 12 257 Warm-Up | Activity 1

Key Concepts

Today's Goals

1. **Goal:** Represent and solve multi-step story problems involving whole numbers using equations with a letter standing for the unknown quantity.
2. **Language Goal:** Compare representations to solve multi-step story problems. **(Listening, Speaking, and Reading)** ELPS 1.E, 2.E, 2.F, 3.H

Connections and Coherence

This is the second of two lessons in which students represent and solve multi-step story problems with a letter standing for the unknown quantity. Students analyze and compare 2 equations that represent 1 story problem to determine which pathway they will choose to solve the story problem. They then justify their choice before continuing the problem-solving process. Students discover that either pathway for solving is reasonable, as they both produce the same value for the unknown. They continue to practice using key information within story problems to solve. **(TEKS 5.1.A, 5.1.B, 5.1.E)**

Prior Learning

In Lesson 12, students represented multi-step story problems using equations with a letter standing for the unknown.

Future Learning

In Lesson 13, students will interpret and compare numerical and written expressions without evaluating using properties of operations.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of representing and solving multi-step story problems using equations with a letter standing for the unknown quantity.

Vocabulary

Review Vocabulary

brackets

order of operations

parentheses

TEKS

Addressing

5.4.B

Represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.

Also Addressing: **5.4.F**

Math Process Standards: 5.1.A, 5.1.B, 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.H

Building On	Building Toward
4.5.A	6.5.B

Building Math Identity

We are a math community.
How can you help others today in math class?

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

Lesson at a Glance

60 min

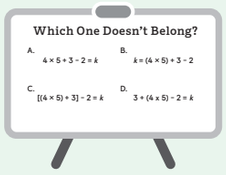
TEKS: 5.1.A, 5.1.B, 5.1.E, 5.1.F, 5.1.G, 5.4.B, 5.4.F

Warm-Up

Fluency

Whole Class | 10 min

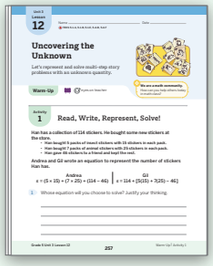
Students use the **Which One Doesn't Belong?** routine to compare equations with different groupings that produce the same value for an unknown quantity. This prepares them to explore multiple pathways to accurately solve multi-step story problems in Activity 1. **(TEKS 5.1.F, 5.1.G)**



Activity 1

Pairs | 20 min

Students work with a partner to compare 2 equations that represent a story problem to determine if they both accurately represent the story problem. They then use the **Mix and Mingle** routine to share their responses with new partners to conclude that some story problems can be represented and solved using more than 1 equation.



Activity 2

Pairs | 15 min

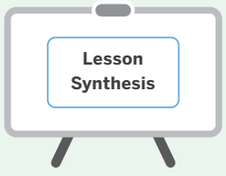
Students build on their work from Activity 1 by analyzing multi-step story problems to solve for the unknown. They use the **Think-Pair-Share** routine to connect their understanding of the order of operations and grouping symbols to their ability to solve accurately for the unknown in story problems.



Synthesis

Whole Class | 10 min

Students review and reflect on how 2 different equations can sometimes represent a story problem and both can produce the correct value for the unknown quantity.



Show What You Know

Independent | 5 min

Students demonstrate their understanding by representing and solving a multi-step story problem using an equation with a letter standing for the unknown quantity.

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.B, 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.

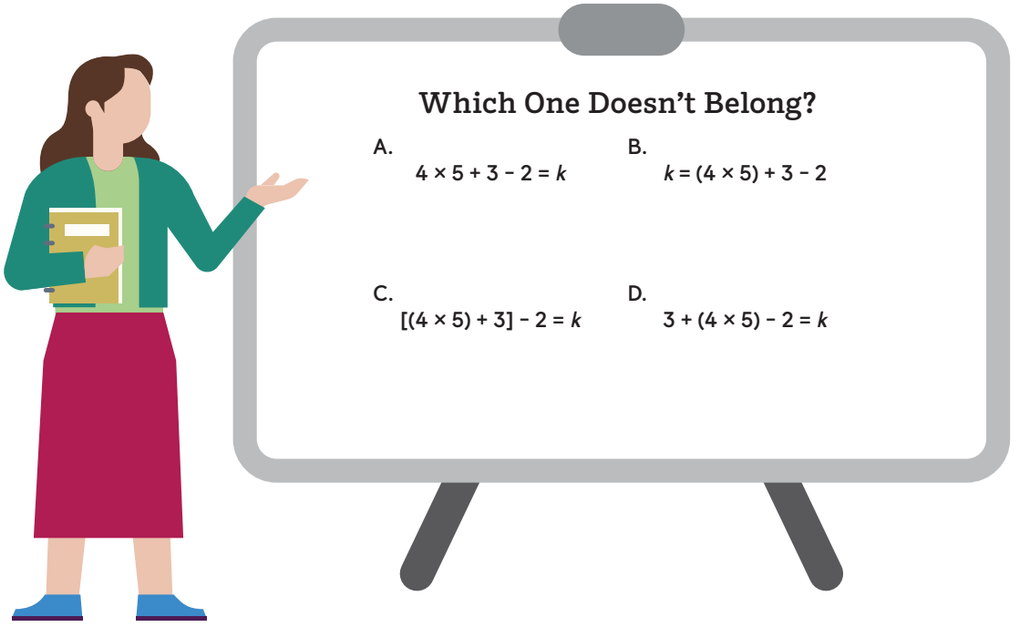
Whole Class | 10 min

Presentation Screens



Warm-Up Which One Doesn't Belong?

Purpose: Students analyze and compare equations to prepare them to identify multiple equations that represent a story problem in Activity 1.





1 Launch

Use the Which One Doesn't Belong? routine.

Say, "Choose one equation 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, " Equation A and Equation C have different groupings. Will the unknown quantity for both equations have the same value? Why or why not?"

Say, "Today, you will continue to solve multi-step story problems by considering more than 1 possible pathway to solve."

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

A: *It is the only equation without grouping symbols.*

B: *It is the only equation where the letter standing for the unknown is on the left side of the equal sign.*

C: *It is the only equation with brackets.*

D: *It is the only one that does not follow the order of operations from left to right.*

Pairs | 20 min

Activity 1 Read, Write, Represent, Solve!

Purpose: Students represent and solve multi-step story problems involving an unknown quantity to determine that multiple equations can represent the same story problem.

Presentation Screens



Short on time? Consider completing Problem 2 as a whole group.

1 Launch



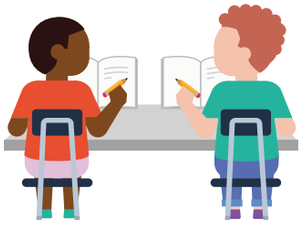
MLR **MLR7: Compare and Connect** Display the different equations that represent the story problem in Problem 1. **ELPS 1.B, 1.E, 2.B, 2.D, 2.E**

Ask:

- "How are the equations similar? How are they different?"
- "Which equation makes the most sense to you?"

Say, "You will work with your partner to complete Problems 1–3."

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 the story problem?"
- Ask, "How can you use the information in the story problem to determine which equation represents the story problem?"

3 Connect



Use the Mix and Mingle routine. Place students in pairs with their Student Edition. Students will share and compare their equation and answer to Problem 3 in each round. After each round, students will find a new partner. Repeat 3–5 times.

Say, "You will share your equation and answer to Problem 3 with each partner. When you meet with your first partner, show them your work and compare how their equation is similar or different to your equation."

MLR **MLR8: Discussion Supports — Sentence Frames** While students discuss Problem 3, display these sentence frames to support discussion.

- "Our equations are similar because . . ."
- "Our equations are different because . . ."
- "I agree with your equation because . . ."
- "I disagree because . . ." **ELPS 1.E, 2.C, 2.E**

Key Takeaway: Say, "Understanding that more than 1 equation can represent a story problem allows you to consider all possibilities for solving. While there can be more than 1 equation that represents a story problem, there can only be 1 correct value for the unknown quantity."

Unit 3
Lesson
12

Name _____ Date _____

TEKS 5.1.A, 5.1.B, 5.1.E, 5.4.B, 5.4.F

Uncovering the Unknown

Let's represent and solve multi-step story problems with an unknown quantity.



Warm-Up eyes on teacher

We are a math community.
How can you help others today in math class?

Activity
1

Read, Write, Represent, Solve!

Han has a collection of 114 stickers. He bought some new stickers at the store.

- **Han bought 5 packs of insect stickers with 15 stickers in each pack.**
- **Han bought 7 packs of animal stickers with 25 stickers in each pack.**
- **Han gave 46 stickers to a friend and kept the rest.**

Andrea and Gil wrote an equation to represent the number of stickers Han has.

Andrea	Gil
$s = (5 \times 15) + (7 \times 25) + (114 - 46)$	$s = 114 + [5(15) + 7(25) - 46]$

1 Whose equation will you choose to solve? Justify your thinking.
Sample response shown.
Gil's equation. I chose his equation because I need to multiply to determine the total number of new new stickers, the friend's stickers, and then add that to the original collection.

Activity
1

Name _____ Date _____

Read, Write, Represent, Solve! (continued)

2 Circle the equation you will use to solve for s, the number of stickers Han has altogether. Then solve for s. Sample work shown.

Show your thinking.

$s = 114 + (5 \times 15) + (7 \times 25) - 46$ $s = 114 + [5(15) + 7(25) - 46]$

$s = 114 + [5(15) + 7(25) - 46]$
$114 + [75 + 175 - 46]$
$114 + [250 - 46]$
$114 + 204$
$= 318$

answer: 318

3 A grocery store received 14 boxes of milk.

- Each box contained 16 bottles of milk.
- The grocery store already had 22 bottles of milk in the fridge.
- There were 9 bottles of milk that were removed from the fridge.

Write an equation that represents m, the number of bottles of milk the grocery store has altogether. Then solve the story problem.

Show your thinking.

Sample work and equation shown.

$m = [(14 \times 16) + 22] - 9$
$m = [224 + 22] - 9$
$m = 246 - 9$
$m = 237$

$$\begin{array}{r} {\scriptstyle 2} \\ 14 \\ \times\ 16 \\ \hline 184 \\ 140 \\ \hline 224 \end{array}$$

equation: $m = [(14 \times 16) + 22] - 9$ answer: 237 bottles

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Represent and solve in the order listed in the problem using an equation with a letter standing for the unknown quantity.	$m = 14 \times 16 + 22 - 9$ $m = 224 + 22 - 9$ $m = 246 - 9$ $m = 237$	**S Strengthen** Ask, "How can you use parentheses and/or brackets to accurately represent the story problem and solve for the unknown quantity?"
Represent and solve using the order of operations and 1 level of grouping.	$m = (14 \times 16) + 22 - 9$ $m = 224 + 22 - 9$ $m = 246 - 9$ $m = 237$	**S Stretch** Ask, "How can you represent the story problem differently, but produce the same value for the unknown quantity?"
Represent and solve using the order of operations and more than 1 level of grouping.	$m = [(14 \times 16) + 22] - 9$ $m = [224 + 22] - 9$ $m = 246 - 9$ $m = 237$	

Independent | 15 min

Activity 2 Story Solutions

Purpose: Students deepen their understanding of the order of operations by solving multi-step story problems with an unknown quantity.

Presentation Screens



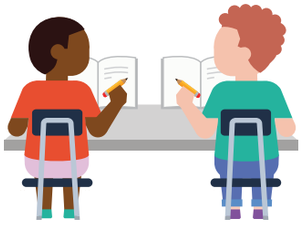
1 Launch



Say, "Work independently to complete Problems 4–6."

A **Accessibility: Executive functioning** Have students make a plan for solving, using what they know about representing multi-step story problems with equations using a letter for the unknown value.

2 Monitor



While students complete **Problem 4**, 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, "How can you represent the story problem before solving?"

3 Connect



Invite students to share their responses and strategies for Problem 4.

Use the Think-Pair-Share routine. Ask:

- "How does your understanding of the order of operations help you determine the best pathway(s) to solve for the unknown quantity?"
- "How does your understanding of the meaning of parentheses and brackets help you to solve accurately for the unknown quantity?"

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

Key Takeaway: Say, "It is important to consider the order of operations when solving equations that represent a multi-step story problem in order to accurately solve for the unknown quantity."

Activity 2

Name _____ Date _____

Story Solutions

4 A librarian is organizing books.
- There are 3 boxes with 65 books in each box.
- The librarian gives 35 books away.
- There are 160 loose books in a bin.
- All of the remaining books will be split evenly between 8 shelves.

How many books will be on each shelf? **Sample work shown.**

Show your thinking.

$m = [3(65) - 35 + 160] \div 8$
$[195 - 35 + 160] \div 8$
$[160 + 160] \div 8$
$320 \div 8 = 40$

answer: 40 books

5 Shawn, Jada, and Diego have $75 to buy snacks. They bought pretzels for $13, popcorn for $12, and sports drinks for $17. They decided to split the leftover money equally. How much money will they each keep?

Show your thinking.

Sample work shown.

$[75 - (13 + 12 + 17)] \div 3 = m$
$[75 - (25 + 17)] \div 3 = m$
$[75 - 42] \div 3 = m$
$33 \div 3 = m$
11 dollars

answer: $11

Activity 2

Name _____ Date _____

Story Solutions (continued)

6 The table shows the number of T-shirts made at a factory in May. The number of T-shirts in Week 4 is represented by t.

Week	Number of T-shirts
1	213,755
2	505,681
3	362,049
4	t

The total number of T-shirts made in May was 1,342,070. Solve for t.

Show your thinking.

Sample work shown.

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ 1} \\ 213,755 \\ 505,681 \\ +\ 362,049 \\ \hline 1,081,485 \end{array}$$

$$\begin{array}{r} {\scriptstyle 2\ 14\ 1\ 9\ 16\ 10} \\ 1,\cancel{3}\cancel{4}\cancel{2},\cancel{0}\cancel{7}\cancel{0} \\ -\ 1,081,485 \\ \hline 260,585 \end{array}$$

answer: 260,585

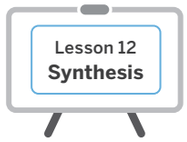
Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Solve for an unknown quantity without attending to the order of operations.	$m = 3 \times 65 - 35 + 160 \div 8$ $m = 195 - 35 + 160 \div 8$ $m = 195 - 35 + 20$ $m = 195 - 55$ $m = 140$	**Support** Ask, "How can you use the order of operations, parentheses, and brackets to accurately solve the story problem?"
Solve for the unknown quantity while attending to the order of operations.	$m = [160 + (3 \times 65) - 35] \div 8$ $m = [160 + 195 - 35] \div 8$ $m = [160 + 160] \div 8$ $m = 320 \div 8$ $m = 40$ or $m = [3(65) - 35 + 160] \div 8$ $m = [195 - 35 + 160] \div 8$ $m = [160 + 160] \div 8$ $m = 320 \div 8$ $m = 40$	**Stretch** "How would your answer change if the librarian received 4 more boxes with 50 books in each box?"

Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: Sometimes the same multi-step story problem can be represented and solved using more than 1 equation. When representing and solving a story problem with an equation, it is necessary to follow the order of operations.



Use the Think-Pair-Share routine. Ask:

- Can either equation be used to solve the story problem? How do you know?

Ask (if not yet mentioned during discussion), "How could you revise one of these equations to represent the story problem?"

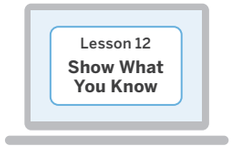
Say, "When using an equation with a letter standing for the unknown to represent and solve a multi-step story problem, it is important to use the information from the problem and your understanding of the order of operations."

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

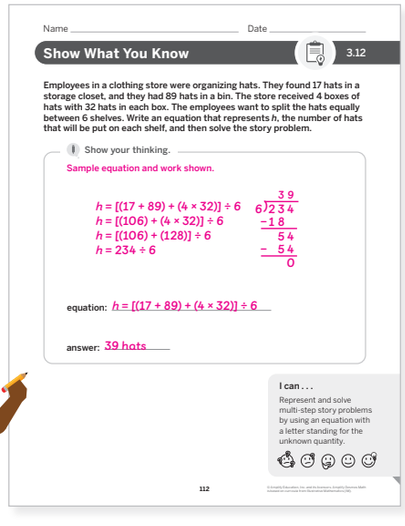
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.12

Employees in a clothing store were organizing hats. They found 17 hats in a storage closet, and they had 89 hats in a bin. The store received 4 boxes of hats with 32 hats in each box. The employees want to split the hats equally between 6 shelves. Write an equation that represents h, the number of hats that will be put on each shelf, and then solve the story problem.

Show your thinking.

Sample equation and work shown.

$h = [(17 + 89) + (4 \times 32)] \div 6$
$h = [(106) + (4 \times 32)] \div 6$
$h = [(106) + (128)] \div 6$
$h = 234 \div 6$

$6\overline{)234}$ → 39, -18, 54, -54, 0

equation: $h = [(17 + 89) + (4 \times 32)] \div 6$

answer: 39 hats

I can . . .
Represent and solve multi-step story problems by using an equation with a letter standing for the unknown quantity.

112

Today's Goals

1. **Goal:** Represent and solve multi-step story problems involving whole numbers using equations with a letter standing for the unknown quantity.
   - In the *Show What You Know*, students represented and solved a multi-step story problem to determine the value of the unknown quantity.
2. **Language Goal:** Compare representations to solve multi-step story problems. **(Listening, Speaking, and Reading)**
   ELPS 1.E, 2.E, 2.F, 3.H

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 including connections to assessment practice, and ongoing spiral review.

Lesson 12
Practice

Students using digital

Students using print

Summary 3.12

When representing story problems, sometimes more than 1 equation can be used to solve, but there is only 1 correct value for the unknown quantity. Representing story problems in more than 1 way allows you to consider all the possible ways to solve story problems.

A basketball team scored points by making baskets worth different numbers of points during a game.
- The team made 4 baskets worth 3 points each.
- The team made 20 baskets worth 2 points each.
- The team made 15 baskets worth 1 point each.

Write an equation that represents p, the total number of points the team scored during the game.

$p = [(4 \times 3) + (20 \times 2)] + 15$ $p = 4(3) + 20(2) + 15$
$p = [12 + 40] + 15$ $p = 12 + 40 + 15$
$p = 52 + 15$ $p = 52 + 15$
$p = 67$ $p = 67$

Practice 3.12

1 A class was tracking the growth of 3 plants in inches.

- Plant A grew 24 inches.
- Plant B grew 2 times as many inches as Plant C.
- Plant C grew 7 inches less than Plant A.

Determine the amount that Plant B grew in inches.

Record your answer in the space provided.

34 inches

Practice 3.12

Name _____ Date _____

2 A bike rental started the day with 65 bikes.

- 7 bikes were rented each hour for the first 3 hours of the day.
- 5 bikes were rented each hour for the last 5 hours of the day.
- At the end of the day, 32 bikes were returned.

The following equation is used by the bike rental to represent r, the number of bikes they have at the end of the day.

$$r = 65 - (7 \times 3) + (5 \times 5) + 32$$

What is the value of r, the number of bikes they have at the end of the day?

(A) 85 (B) 110
(C) 96 (D) 101

3 At a restaurant, a family spent $237. They spent $101 on pizzas and $87 on salads. They spent the rest of the money on dessert. The family used the following equation to represent d, the amount of money they spent on dessert.

$$d = 237 - (101 + 87)$$

Which is the value of d, the amount of money the family spent on dessert?

(A) 49 (B) 50
(C) 223 (D) 56

Practice 3.12

Name _____ Date _____

4 Priya bought bottles of paint at the craft store.

- 8 bottles of blue paint were $5 each.
- 11 bottles of red paint were $4 each.
- 4 bottles of green paint were $6 each.

Priya used the following equation to represent n, the total cost of the bottles of paint.

$$n = 8(5) + 11(4) + 4(6)$$

Which is the value of n, the total amount of money Priya spent on the bottles of paint?

(A) 108 (B) 100
(C) 97 (D) 102

Spiral Review

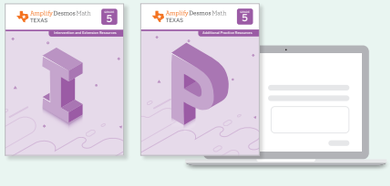
For Problems 5–12, determine whether the comparison statement is true or false.

5 $0.9 = \frac{9}{100}$ false
6 $\frac{7}{10} < 0.70$ false
7 $0.5 > \frac{5}{100}$ true
8 $0.8 < \frac{8}{100}$ false
9 $\frac{25}{100} = 0.25$ true
10 $1.5 = \frac{15}{10}$ true
11 $9.9 = \frac{99}{100}$ false
12 $12.7 > \frac{127}{100}$ true

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-lesson			
Test Practice	1	2	5.4.B
Fluency	2–4	2	5.4.B, 5.4.F
Spiral Review			
	5–12	1	4.2.G

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 and solve multi-step story problems involving whole numbers using equations with a letter standing for the unknown quantity.

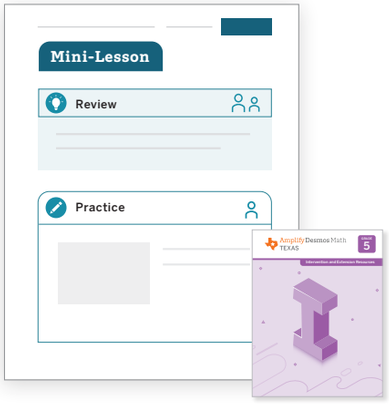
Support

Provide targeted intervention for students by using these resources.

If students represent and solve story problems with an equation:

Respond:

- Assign the *Solving Multi-Step Story Problems* Mini-Lesson. | 15 min
- Review the order of operations and the meaning of parentheses and brackets.
- Students will also have more opportunities to develop this concept in future lessons, so intervention is not necessary at this time.



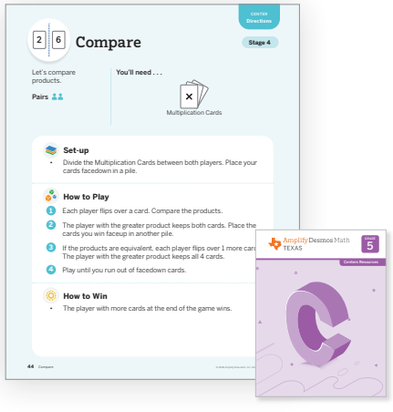
Strengthen

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

If students represent and solve story problems with equations using a letter standing for the unknown:

Respond:

- Invite students to play these **Centers**. | 15 min
  Compare: Multi-Digit Operations
  Equation Challenge: Multi-Digit Factors
  Watch Your Remainder:
  - *One-Digit Divisors*
  - *Two-Digit Divisors*
- Have students complete **Lesson 12 Practice.** | 15 min
- **Item Bank**



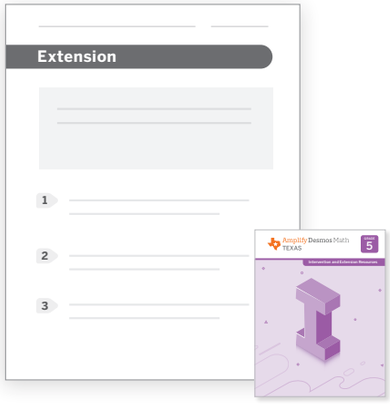
Stretch

Challenge students and extend their learning with these resources.

If students represent and solve story problems with a multi-step equation using a letter standing for the unknown:

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., *brackets/soportes*
- Frayer Model templates
- Vocabulary routines



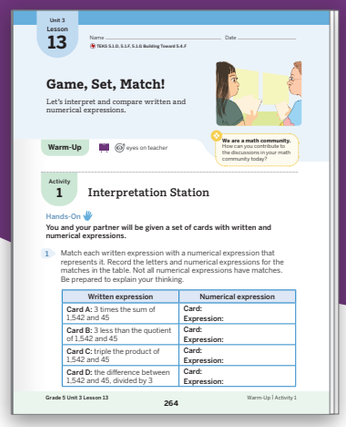


Professional Learning

Reflect on the opportunities students have to draw comparisons and choose between pathways for solving problems in the real world. How can you support students with making problem-solving decisions in their school and community?

Unit 3
Lesson
13

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


Unit 3 Lesson 13

Game, Set, Match!

Let's interpret and compare written and numerical expressions.

Warm-Up

Activity 1 Interpretation Station

Hands-On

You and your partner will be given a set of cards with written and numerical expressions.

1 Match each written expression with a numerical expression that represents it. Record the letters and numerical expressions for the matches in the table. Not all numerical expressions have matches. Be prepared to explain your thinking.

Written expression	Numerical expression
Card A: 3 times the sum of 1,542 and 45	**Card:** **Expression:**
Card B: 3 less than the quotient of 1,542 and 45	**Card:** **Expression:**
Card C: triple the product of 1,542 and 45	**Card:** **Expression:**
Card D: the difference between 1,542 and 45, divided by 3	**Card:** **Expression:**

Grade 5 Unit 3 Lesson 13 264 Warm-Up | Activity 1

Game, Set, Match!

Using Reasoning, Without Simplifying, to Compare Expressions

Let's interpret and compare written and numerical expressions.

Key Concepts

Today's Goals

1. **Goal:** Interpret and compare numerical and written expressions, without simplifying, using properties of the 4 operations.
2. **Language Goal:** Describe numerical expressions using properties of the 4 operations. **(Listening, Speaking, Reading, and Writing)**
   ELPS 1.E, 2.E, 2.F, 3.H, 4.D, 4.F

Connections and Coherence

Students apply their understanding of grouping symbols and the properties of the 4 operations to interpret, match, and compare numerical and written expressions without simplifying. Students analyze the relationships between the language in written expressions and the operations in numerical expressions to identify matching representations. They then use their understanding of the meaning of terms such as *difference*, *expression*, *product*, *quotient*, and *sum* to explain and justify their mathematical decisions. **(TEKS 5.1.D, 5.1.F, 5.1.G)**

Prior Learning

In Sub-Units 1 and 2, students estimated products and quotients involving 2 multi-digit numbers.

Future Learning

In Unit 5, students apply their understanding of the order of operations to simplify expressions involving multiplication and division with fractions and decimals.

Integrating Rigor in Student Thinking

- Students **apply** their understanding of grouping symbols and the 4 operations to compare the values of numerical and written expressions without simplifying.

Vocabulary

Review Vocabulary

difference
expression
product
quotient
sum

TEKS

Building Toward

5.4.F

Simplify numerical expressions that do not involve exponents, including up to two levels of grouping.

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

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

Building On

5.3.A

Building Math Identity

We are a math community.
How can you contribute to the discussions in your math community today?

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

Lesson at a Glance

60 min

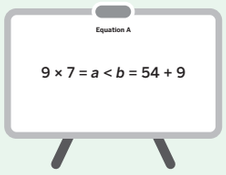
TEKS: 5.1.D, 5.1.F, 5.1.G, Building Toward 5.4.F

Warm-Up

Fluency

Whole Class | 10 min

Students use the **True or False?** routine, in which they determine whether a series of comparison statements are true or false and justify their responses.



Activity 1

Pairs | 20 min

Students interpret and match numerical and written expressions without simplifying. They explain how the structure of the numerical expressions is related to the written expressions to deepen their understanding of the connection between mathematical language and the 4 operations.

Materials: Activity 1 PDF chart paper, markers, *Words and Numbers in Expressions* chart (teacher made)
Additional Prep Cut out: Activity 1 PDF

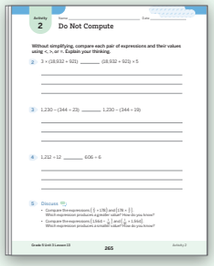


Activity 2

Pairs | 15 min

Students compare 2 numerical expressions using <, >, or =. They explain and justify their thinking, recognizing that they can use their understanding of operations to compare the expressions.

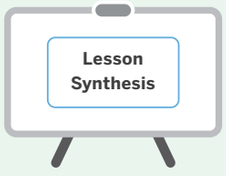
Materials: *Words and Numbers in Expressions* chart (from Activity 1)



Synthesis

Whole Class | 10 min

Students review and reflect on strategies for comparing expressions without simplifying.

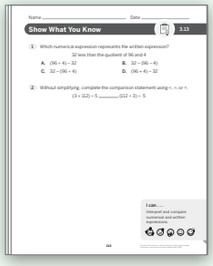


Show What You Know

Independent | 5 min

Students demonstrate their understanding by comparing the values of numerical expressions by using <, >, or =.

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.B, 2.C, 2.D, 2.E, 2.F, 3.C, 4.C, 4.D

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** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** and **write** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** and **write** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** and **write** using longer sentences. Exemplar responses are provided.

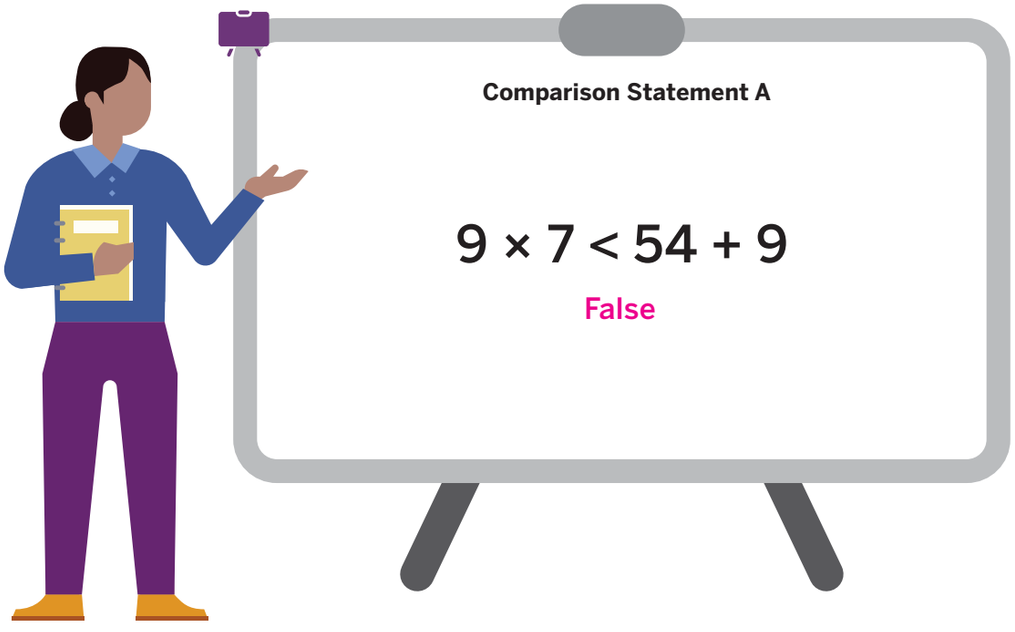
Whole Class | 10 min

Presentation Screens



Warm-Up True or False? Fluency

Purpose: Students analyze comparison statements without simplifying, to develop strategies for comparing complex expressions.



Comparison Statement B

$80 \div 2 = 80 \times \frac{1}{2}$

True

Comparison Statement C

$2 \times (9 - 4) > 2 \times (9 - 5)$

True

Comparison Statement D

$2 \times 3 \times 8 = 2 \times 25$

False

Why these problems? These comparisons lend themselves to developing strategies for comparing numerical expressions without simplifying.

1 Launch

Use the True or False? routine.

Display 1 comparison statement at a time.

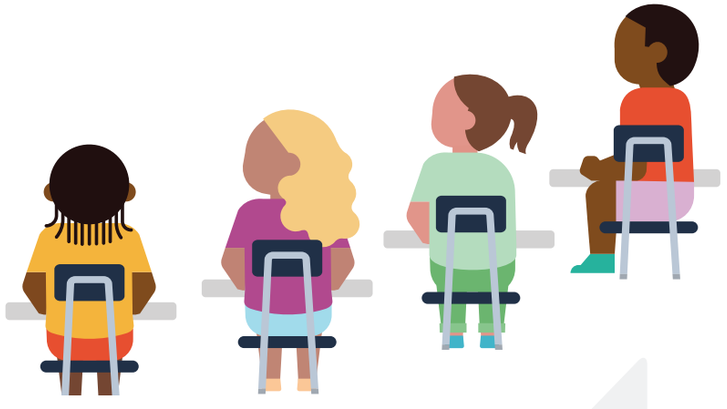
Say, "Give me a signal when you know whether the statement is true and can explain how you know."

2 Connect

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

Repeat with each comparison.

Ask, "How did you use your understanding of the 4 operations to reason without simplifying?"



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

A: False. 54 + 9 is equal to 9 × 6 + 9.

B: True. The whole number is the same, but $\frac{1}{2}$ is less than 1. When you multiply a whole number by a number less than 1, the product is smaller than the whole number.

C: True. Both show 2 times as much, but 9 - 4 is greater than 9 - 5,

D: False. Both show 2 times as much, but 25 is greater than 8 × 3, so 2 × 25 is greater.

Pairs | 20 min

Activity 1 Interpretation Station

Purpose: Students use the 4 operations and grouping symbols to interpret and match numerical and written expressions without simplifying.

Presentation Screens



Materials

Lesson Resources:

- Distribute one set of pre-cut cards from the Activity 1 PDF to each pair of students during the Launch.

Classroom materials:

- Use chart paper and markers to prepare the *Words and Numbers in Expressions* chart before the activity. Display the Words and Numbers in Expressions chart during the Connect.

1 Launch



Read aloud the introduction and Problem 1.

Say, "Complete Problem 1 with your partner."

EB **Emergent Bilinguals** Encourage students to annotate the written expressions with numbers and symbols. For example, write "× 3" above triple and "–" above difference. Consider demonstrating these annotations as needed. ELPS 1.E, 2.E

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, "What operations are you looking for in a numerical expression? Why?"
- Ask, "Based on the written expression, what part of the expression is being grouped? How do you know?"

3 Connect



Use the Think-Pair-Share routine. Ask:

- "What strategies did you use to determine the matching numerical and written expressions?"
- "How did your understanding of mathematical language help you interpret each card?"

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

- Record students' thinking using mathematical vocabulary such as *quotient, minus, sum, total,* and *difference.*
- Add the language students use to the *Words and Numbers in Expressions* chart, and remind them to continue to refer to and use the display while comparing equations and their values.

Key Takeaway: Say, "You can interpret numerical or written expressions using math language connected to the 4 operations and grouping symbols."

Student Edition

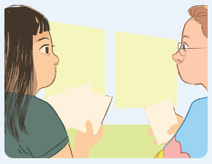
Unit 3
Lesson
13

Name _____ Date _____

TEKS 5.1.D, 5.1.F, 5.1.G Building Toward 5.4.F

Game, Set, Match!

Let's interpret and compare written and numerical expressions.



Warm-Up eyes on teacher

We are a math community. How can you contribute to the discussions in your math community today?

Activity
1

Interpretation Station

Hands-On

You and your partner will be given a set of cards with written and numerical expressions.

1 Match each written expression with a numerical expression that represents it. Record the letters and numerical expressions for the matches in the table. Not all numerical expressions have matches. Be prepared to explain your thinking.

Written expression	Numerical expression
Card A: 3 times the sum of 1,542 and 45	Card: E Expression: 3 × (1,542 + 45)
Card B: 3 less than the quotient of 1,542 and 45	Card: G Expression: (1,542 ÷ 45) − 3
Card C: triple the product of 1,542 and 45	Card: I Expression: 3 × (1,542 × 45)
Card D: the difference between 1,542 and 45, divided by 3	Card: F Expression: (1,542 − 45) ÷ 3

Grade 5 Unit 3 Lesson 13 264 Warm-Up | Activity 1

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . . (Card B)	Provide support . . .
Almost there Identify that a numerical expression is not a match because it has math that has not been covered yet.	*Card H does not match Card B because I cannot subtract a number greater than 3 from 3.*	**Support** Ask, "In future grades, you will learn how to evaluate expressions like this. What is 3 less than 5? What expression represents that? How could you use that thinking here?"
Almost there Match the numerical expressions based on the order that the numbers appear in the written statement.	*I need a numerical expression that shows 3 − (1,542 ÷ 45).*	**Support** Ask, "What is 3 less than 5? What expression represents that? How could you use that thinking here?"
Use language connected to operations and parentheses.	*I see 1,542 ÷ 45 in parentheses, so the parentheses are grouping a quotient. That matches the written expression that says "quotient."*	**Strengthen** Ask, "What other words might you look for that are related to that operation?"

Pairs | 15 min

Activity 2 Do Not Compute

Purpose: Students use their understanding of the 4 operations and grouping symbols to interpret and compare numerical expressions without simplifying.

Presentation Screens



Materials

Classroom materials:

- Display and reference the *Words and Numbers in Expressions* chart during the Activity.

1 Launch



Read aloud the directions for Problems 2–5.

Ask, "What mathematical language would be useful to describe which expression has a greater value?"

Record mathematical vocabulary and phrases. Keep this displayed for the rest of the activity.

Say, "Complete Problems 2–5 with your partner."

A **Accessibility: Visual-spatial processing** Invite students to annotate the similarities and differences between expressions. For example, in Problem 2, guide visualization by circling the sums in parentheses and highlighting the 3 and 5.

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, "Look at 1 expression at a time. How would you interpret this expression?"
- Ask, "Now compare the expressions side by side. What is the same? Different? How does that affect their values?"

EB **Emergent Bilinguals** Encourage students to annotate the numerical expression with words and phrases. For example, write "times as many" above multiplication operations, and "difference" above subtraction operations. Consider demonstrating these annotations as needed. ELPS 4.C

3 Connect



MLR **MLR1: Stronger and Clearer Each Time** Have students meet with 1–2 other pairs to share their responses to Problem 3. Invite students to include supporting details and evidence in their explanations, such as how 23 is greater than 19. Encourage listeners to ask clarifying questions using stems such as: ELPS 1.E, 2.E, 4.F

- "What do you mean by . . . ?"
- "Can you tell me more about . . . ?"

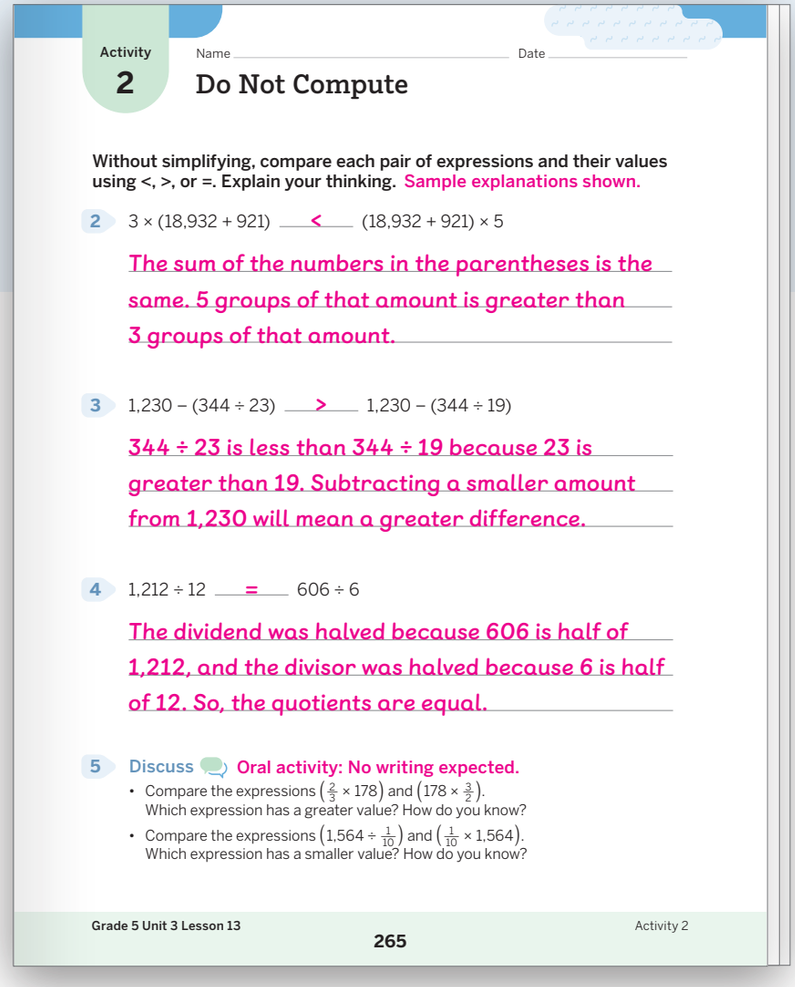
Have students revise their responses based on the feedback. Invite them to write in a style that will persuade their classmates.

Invite a pair to share their revised response. Consider using a student response that would benefit from class revisions, such as Row 1 in the *Differentiation* table.

Record the response and invite the class to suggest revisions.

Key Takeaway: Say, "You can use what you know about the 4 operations and grouping symbols to compare expressions without simplifying."

Student Edition



Activity 2

Name _____ Date _____

Do Not Compute

Without simplifying, compare each pair of expressions and their values using <, >, or =. Explain your thinking. Sample explanations shown.

2 $3 \times (18{,}932 + 921)$ ___<___ $(18{,}932 + 921) \times 5$

The sum of the numbers in the parentheses is the same. 5 groups of that amount is greater than 3 groups of that amount.

3 $1{,}230 - (344 \div 23)$ ___>___ $1{,}230 - (344 \div 19)$

344 ÷ 23 is less than 344 ÷ 19 because 23 is greater than 19. Subtracting a smaller amount from 1,230 will mean a greater difference.

4 $1{,}212 \div 12$ ___=___ $606 \div 6$

The dividend was halved because 606 is half of 1,212, and the divisor was halved because 6 is half of 12. So, the quotients are equal.

5 Discuss Oral activity: No writing expected.

- Compare the expressions $\left(\frac{2}{3} \times 178\right)$ and $\left(178 \times \frac{3}{2}\right)$. Which expression has a greater value? How do you know?
- Compare the expressions $\left(1{,}564 \div \frac{1}{10}\right)$ and $\left(\frac{1}{10} \times 1{,}564\right)$. Which expression has a smaller value? How do you know?

Grade 5 Unit 3 Lesson 13 265 Activity 2

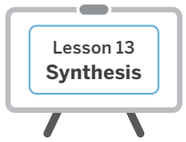
Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Interpret and compare part of the expression.	I know that 344 ÷ 23 is less than 344 ÷ 19 because the dividends are the same and more groups of 19 can fit in 344.	**Support** Draw 2 area models in which the whole is 1,230 and the difference between subtracting a larger amount compared to subtracting a lesser amount is shown. Ask, "How do these area models help you revise your answer?"
Use what they know about operations to interpret and compare expressions.	344 ÷ 23 is less than 344 ÷ 19 because 23 is greater than 19, so fewer groups of 23 are equal to 344. Subtracting a smaller amount from 1,230 will mean a greater difference.	**Stretch** Ask, "If these expressions showed the sum of 1,230 and the amount in the parentheses, would the first expression be less? Why or why not?"

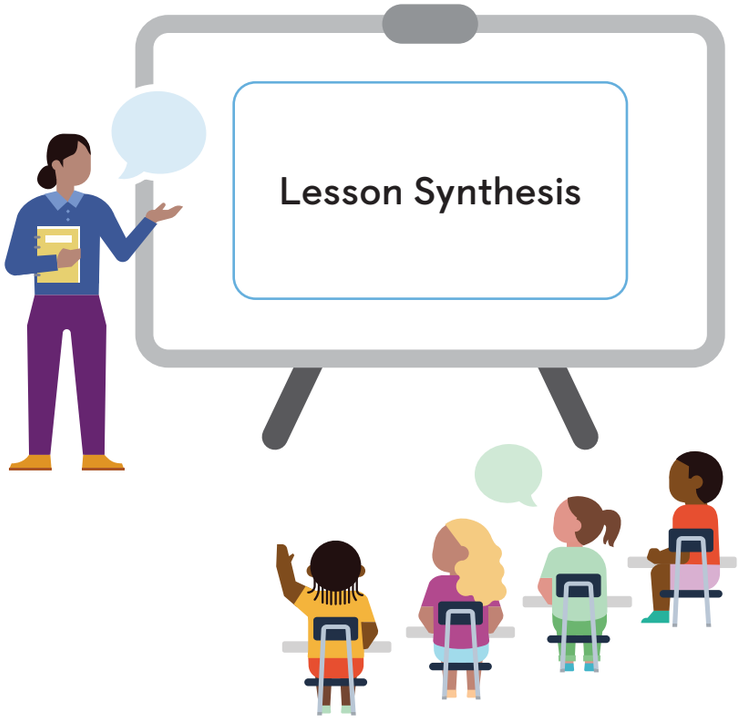
Whole Class | 10 min

Presentation Screen



Synthesis

Lesson Takeaway: Expressions can be interpreted and compared using an understanding of the 4 operations and grouping symbols. When comparing expressions, it is helpful to consider the relationship between the size of the numbers and the operation.



Use the Think-Pair-Share routine. Say, "Change only 1 number in the expression on the left to make the comparison statement true. Be prepared to share your reasoning."

Invite pairs to share their expression and reasoning.

Record students' responses as they share.

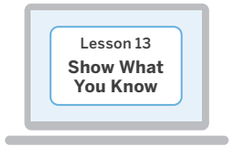
Say, "When comparing 2 expressions without simplifying, it could be helpful to consider the relationship between the size of the numbers and the operation. For example, adding or multiplying by a larger number makes the value of an expression greater, while subtracting or dividing by a larger number makes the value of the expression smaller."

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

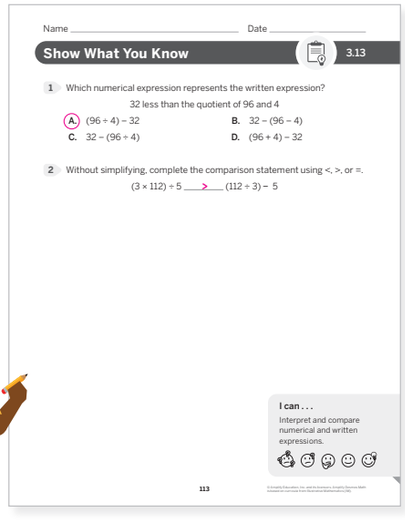
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.13

1 Which numerical expression represents the written expression?

32 less than the quotient of 96 and 4

A. (96 ÷ 4) − 32
B. 32 − (96 − 4)
C. 32 − (96 ÷ 4)
D. (96 + 4) − 32

2 Without simplifying, complete the comparison statement using <, >, or =.

(3 × 112) ÷ 5 ___>___ (112 ÷ 3) − 5

I can . . .
Interpret and compare numerical and written expressions.

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Today's Goals

1. **Goal:** Interpret and compare numerical and written expressions, without simplifying, using properties of the 4 operations.
   - In Problem 2 in the *Show What You Know*, students compared numerical expressions without simplifying.
2. **Language Goal:** Describe numerical expressions using properties of the 4 operations. **(Listening, Speaking, Reading, and Writing)** **ELPS 1.E, 2.E, 2.F, 3.H, 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 13
Practice

Students using digital

Students using print

Summary 3.13

You can use what you know about the order of operations, including grouping symbols, to compare the value of expressions without simplifying them.

$$2 \times (9 - 4) > 2 \times (9 - 5)$$

- Both expressions show 2 times an amount.
- 9 – 4 is greater than 9 – 5 because the distance between the numbers 9 and 4 is greater.
- So, the value of 2 × (9 – 4) is greater.

Practice 3.13

For Problems 1–3, without simplifying, compare each pair of expressions and their values using <, >, or =.

1 2,010 – (563 ÷ 51) ___>___ 2,010 – (563 ÷ 15)

2 204 ÷ 12 ___=___ $204 \div \left(\frac{1}{2} \times 24\right)$

3 $\frac{1}{100} \div 9{,}087$ ___<___ $\frac{1}{100} \times 9{,}087$

4 Which numerical expressions are equal to the value of the written expression? Select *all* that apply.

The value is triple the quotient of 665 and 25.

(A) 3 × (25 ÷ 665)
(B) 3 × (665 ÷ 25)
(C) (665 ÷ 25) × 3
(D) 3 ÷ (25 × 665)

Practice 3.13

Name _____ Date _____

5 The table shows numerical expressions and their matching written expressions.

Select **TWO** numerical expressions that accurately represent the written expressions.

Numerical expression	Written expression
(A) (2,317 + 2) – 58	The value is 58 less than the product of 2,317 and 2.
(B) (2,317 × 58) – 2	The value is 2 less than the product of 2,317 and 58.
(C) (2,317 ÷ 58) × 2	The value is the difference between 2,317 and 58 multiplied by 2.
(D) (2 + 2,317) × 58	The value is 58 more than the product of 2,317 and 2.
(E) 2(2,317 + 58)	The value is double the sum of 2,317 and 58.

For Problems 6–8, match the written expression with the numerical expression it represents.

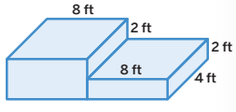
Written expression	Numerical expression
6 The value is double the quotient of 906 and 31.	___7___ (906 × 31) – 2
7 The value is 2 less than the product of 906 and 31.	___6___ 2 × (906 ÷ 31)
8 The value equals the difference between 31 and 2 multiplied by 906.	___8___ (31 – 2) × 906

Practice 3.13

Name _____ Date _____

Spiral Review

9 A landscape company designed a raised garden bed with the dimensions shown. Write an expression that can be used to determine the volume of the garden bed. Sample response shown.



(8 × 4 × 4) + (8 × 2 × 4)

10 The dimensions of a rectangular prism are 18 inches by 10 inches by 15 inches. Determine the volume of the prism in cubic inches.

Record you answer in the space provided.

2,700 cubic inches

For Problems 11–14, determine the value of the expression.

11 80 × 50 ___4,000___

12 11 × 110 ___1,210___

13 5,600 ÷ 8 ___700___

14 280 ÷ 40 ___7___

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-Lesson			
	1–4, 6–8	2	5.4.F*
Test Practice	5	2	5.4.F*
Spiral Review			
	9	2	5.4.G
Test Practice	10	1	5.4.H
Fluency	11–14	1	5.3.B, 5.3.C

*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 13

Lesson Goal: Interpret and compare numerical and written expressions, without simplifying, using the properties of the 4 operations.

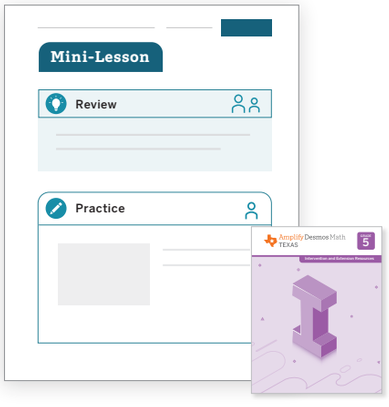
Support

Provide targeted intervention for students by using these resources.

If students compare the values of numerical expressions by simplifying:

Respond:

- Assign the *Interpreting and Comparing Written and Numerical Expressions* Mini-Lesson. | 15 min
- Revisit Lesson 12.



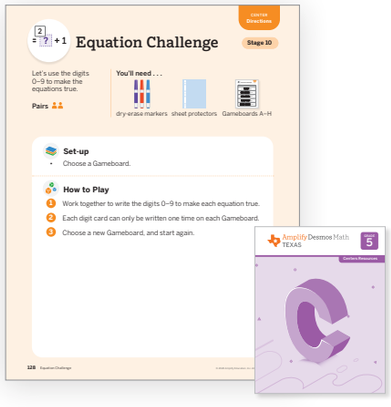
Strengthen

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

If students compare the values of numerical expressions using the properties of the 4 operations:

Respond:

- Invite students to play these **Centers.** | 15 min
  Equation Challenge: Multi-Digit Factors
  Watch Your Remainder: Two-Digit Divisors
- Have students complete **Lesson 12 Practice.** | 15 min
- **Item Bank**



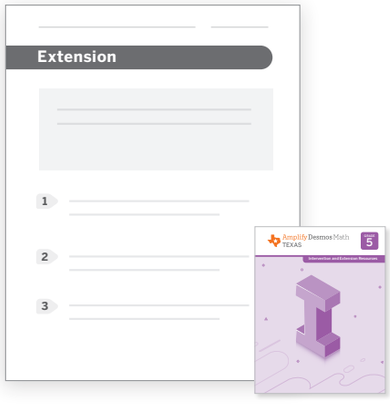
Stretch

Challenge students and extend their learning with these resources.

If students Interpret and compare the values of numerical and written expressions using the 4 operations:

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
- Frayer Model templates
- Vocabulary routines





Professional Learning

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

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 3

Independent | 20 min

Facilitation: Assign this Sub-Unit Quiz at the end of Sub-Unit 3 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	Concept or skill	DOK	TEKS
1	Writing equations using parentheses to represent multi-step story problems	1	5.4.B *(R)*
2	Writing and solving equations using parentheses to represent multi-step story problems	2	5.4.B *(R)*, 5.4.F *(R)*

Assessment Resources



- Student Print Assessments
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources includes:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

During Sub-Unit 4, if students need further review or practice with concepts or skills, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

Assessment Resource PDF

Name _____ Date _____

Quiz: Sub-Unit 3

Unit 5.3

1 Priya, Andrea, and Gil practiced for their upcoming basketball tryouts.

- Priya practiced 16 hours.
- Andrea practiced 3 more hours than Priya.
- Gil practiced 5 times as much as Andrea.

Which equation represents m, the number of hours Gil practiced?

A. $(16 - 3) \div 5 = m$
B. $(16 - 3) \times 5 = m$
C. $(16 + 3) \div 5 = m$
D. $(16 + 3) \times 5 = m$

2 The music teacher was organizing her instruments. She found 18 recorders in a storage closet and an additional 92 recorders in the office. She ordered 5 boxes with 23 recorders in each box. She needs to split the recorders equally between 9 grades. Write an equation that represents r, the number of recorders for each grade level, and then solve the story problem. **Sample equation and work shown.**

Show your thinking.

$r = [(18 + 92) + (5 \times 23)] \div 9$
$r = [(110) + (5 \times 23)] \div 9$
$r = [(110) + (115)] \div 9$
$r = 225 \div 9$

$$\begin{array}{r} 25 \\ 9\overline{)225} \\ -\ 9 \\ \hline 35 \\ -\ 35 \\ \hline 0 \end{array}$$

equation: $r = [(18 + 92) + (5 \times 23)] \div 9$

answer: 25 recorders

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Digital

Unit 3
Quiz: Sub-Unit 3

D Differentiation (Quiz: Sub-Unit 3)

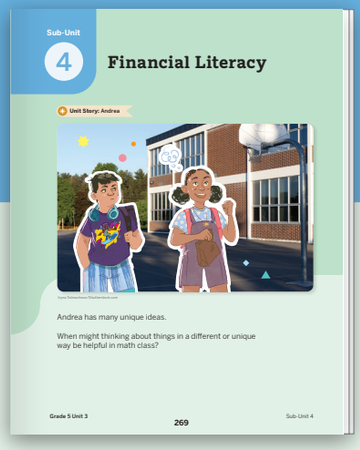
To **Strengthen** and **Stretch** students' learning, refer to the differentiation resources suggested throughout this Sub-Unit.

Sub-Unit Goals	Problem	Respond to Student Thinking
Sub-Unit 3: • Use parentheses in numerical expressions and evaluate expressions with parentheses. • Interpret and compare written and numerical expressions without evaluating them.	1	**Support** • **Mini-Lesson:** *Selecting Equations With Parentheses to Represent Multi-Step Story Problems* (ML 3.11)
	2	**Support** • **Mini-Lesson:** *Solving Multi-Step Story Problems* (ML 3.12) • **Teacher Move:** Have students review the problem. Provide another opportunity for students to interpret and solve expressions.

Notes:

Sub-Unit 4

Financial Literacy



Sub-Unit 4 Goals:

- Calculate gross income and net income.
- Define income tax, payroll tax, sales tax, and property tax.
- Identify the advantages and disadvantages of debit cards, credit cards, checks, and electronic payments.
- Balance a simple budget and describe actions to take to eliminate expenses.
- Create and use a financial record.

Progression of TEKS in Sub-Unit 4

- **Lesson 14:** Students define **income tax**, **payroll tax**, **sales tax**, and **property tax**, and apply their understanding of the different tax types to calculate **gross income** and **net income**.
- **Lesson 15:** Students determine whether a **budget** is balanced based on whether expenses exceed income. They determine which actions to take to eliminate expenses, resulting in a **balanced budget**.
- **Lesson 16:** Students develop financial records to track their deposits, withdrawals, and expenses, and determine that keeping a financial record is a helpful tool for tracking expenses to inform future financial decisions.
- **Lesson 17:** Students identify the advantages and disadvantages of **credit cards**, **debit cards**, **checks**, and **electronic payments**. They analyze real-world scenarios to determine which payment method to use for expenses.

Sub-Unit 4 Progression	Lesson 14	Lesson 15	Lesson 16	Lesson 17
Number and operations				
TEKS 5.3.K	○	●	●	○
Personal financial literacy				
TEKS 5.10.A	●	●	○	○
TEKS 5.10.B	●	○	○	●
TEKS 5.10.C	○	○	○	●
TEKS 5.10.D	○	○	●	○
TEKS 5.10.E	○	●	○	○
TEKS 5.10.F	○	●	○	○

Math That Matters Most

Sub-Unit 4: Use an understanding of tax types and payment methods to develop a system for keeping financial records and a balanced budget.

Progression of Strategies, Skills, or Language

Using understanding of income tax, payroll tax, sales tax, and property tax to determine net income.

What is the difference between sales tax and property tax?

Sales tax is a tax that you pay when you buy things such as groceries and clothes.

Property tax is a tax you pay on property that is owned, such as a house or land.

If $65.89 is taken out of Jada's gross income of $1,000 for taxes, what is her net income?

1,000.00 ⟵ gross income
− 65.10 ⟵ taxes
934.90 ⟵ net income

Describing actions that might be taken to balance a budget when expenses exceed income.

Gil's brother earned $280 this week. He made a list of his expenses. Describe a change he can make to have a balanced budget for the week.

Expense	Amount
cell phone	$60
gym membership	$40
entertainment	$65
food	$80
savings	$75

Gil's brother is $40 over his income for the week. To have a balanced budget, Gil's brother could spend $25 on entertainment instead of $65.

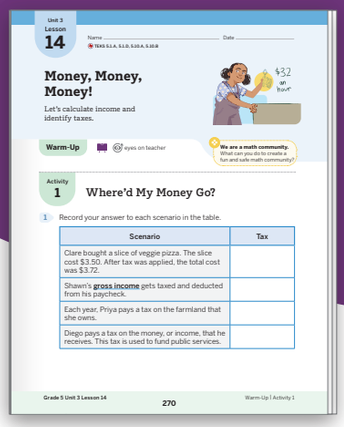
Developing a system for keeping and using financial records.

Use the financial record below to calculate the account balance.

Day	Description	Withdrawal	Deposit	Account balance
Fri.	video game	$35.50		$85.50
Fri.	toy store	$25.10		**$60.40**
Sat.	mowing		$30.00	**$90.40**
Sat.	pizza	$15.75		**$74.65**
Sun.	chores		$20.00	**$94.65**

Unit 3
Lesson
14

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


Unit 3 Lesson 14

Money, Money, Money!

Let's calculate income and identify taxes.

Warm-Up

We are a math community. What can you do to create a fun and safe math community?

Activity 1 Where'd My Money Go?

1 Record your answer to each scenario in the table.

Scenario	Tax
Clare bought a slice of veggie pizza. The slice cost $3.50. After tax was applied, the total cost was $3.72.	
Shawn's gross income gets taxed and deducted from his paycheck.	
Each year, Priya pays a tax on the farmland that she owns.	
Diego pays a tax on the money, or income, that he receives. This tax is used to fund public services.	

Grade 5 Unit 3 Lesson 14 270 Warm-Up | Activity 1

Money, Money, Money!

Types of Income and Taxes

Let's calculate income and identify taxes.

Key Concepts

Today's Goals

1. **Goal:** Apply mathematical operations to calculate gross income and net income.
2. **Language Goal:** Define income tax, payroll tax, sales tax, and property tax. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E
3. **Language Goal:** Explain the difference between gross income and net income. **(Listening, Speaking, and Writing)** ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F

Vocabulary

New Vocabulary

- gross income
- income tax
- net income
- payroll tax
- property tax
- sales tax

Review Vocabulary

income

Connections and Coherence

Students develop a deeper understanding of financial literacy as they explore the concepts of **gross income** and **net income** through real-world scenarios. They strengthen their understanding of net income through the exploration of various taxes that impact finances in everyday life and demonstrate their knowledge using precise language. **(TEKS 5.1.A, 5.1.D)**

Prior Learning

In Grade 4, students calculated profits and described how to allocate weekly allowances giving them an insight into money being made and how to use that money.

Future Learning

In Lesson 16, students will use their understanding of net income to create a budget for spending money.

TEKS

Addressing

5.10.B

Explain the difference between gross income and net income.

Also Addressing: **5.10.A**

Math Process Standards: 5.1.A, 5.1.D

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

Building On

4.10.B

4.10.D

Integrating Rigor in Student Thinking

- Students develop their **conceptual understanding** of gross and net income, as well as different types of taxes and how they relate to wages.
- Students **apply** their understanding of operations involving money to solve real-world problems.

Building Math Identity

We are a math community.
What can you do to create a fun and safe math community?

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

Lesson at a Glance

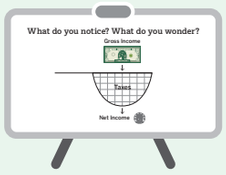
60 min

TEKS: 5.1.A, 5.1.D, 5.10.A, 5.10.B

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about income. They are introduced to the terms **gross income**, and **net income**.



Activity 1

Small Groups | 20 min

Students move around the room to explore various scenarios where taxes are deducted and identify **income tax**, **payroll tax**, **property tax**, and **sales tax**. Students then use this information to calculate gross income and net income and explain the difference.

Materials: Activity 1 PDF, chart paper, markers, *Tax Types* chart (teacher made)

Note: Print Activity 1 PDF front and back to allow students to check their answers as they go.



Activity 2

Pairs | 15 min

Students work in pairs to calculate and explain why it is important to know the difference between the 2 types of income. Students also identify taxes being deducted in real-world scenarios.

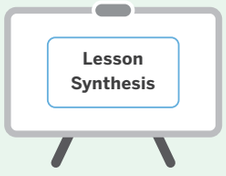
Materials: *Tax Types* chart (from Activity 1)



Synthesis

Whole Class | 10 min

Students review and reflect on the difference between gross income and net income and which is more helpful to know when making financial decisions.

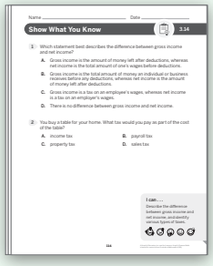


Show What You Know

Independent | 5 min

Students demonstrate their understanding of net income and gross income by describing the difference. Students also demonstrate an understanding of various types of taxes by identifying the correct tax form being deducted in a scenario.

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.B, 1.E, 2.B, 2.C, 2.D, 2.E, 2.F, 3.C, 4.C, 4.D

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** and **write** using their primary languages, gestures, and single words or short phrases.	Students **listen** to and **read** English. They **speak** and **write** using short phrases or simple sentences.	Students **listen** to and **read** English. They **speak** and **write** using a variety of sentence types.	Students **listen** to and **read** English. They **speak** and **write** using longer sentences. Exemplar responses are provided

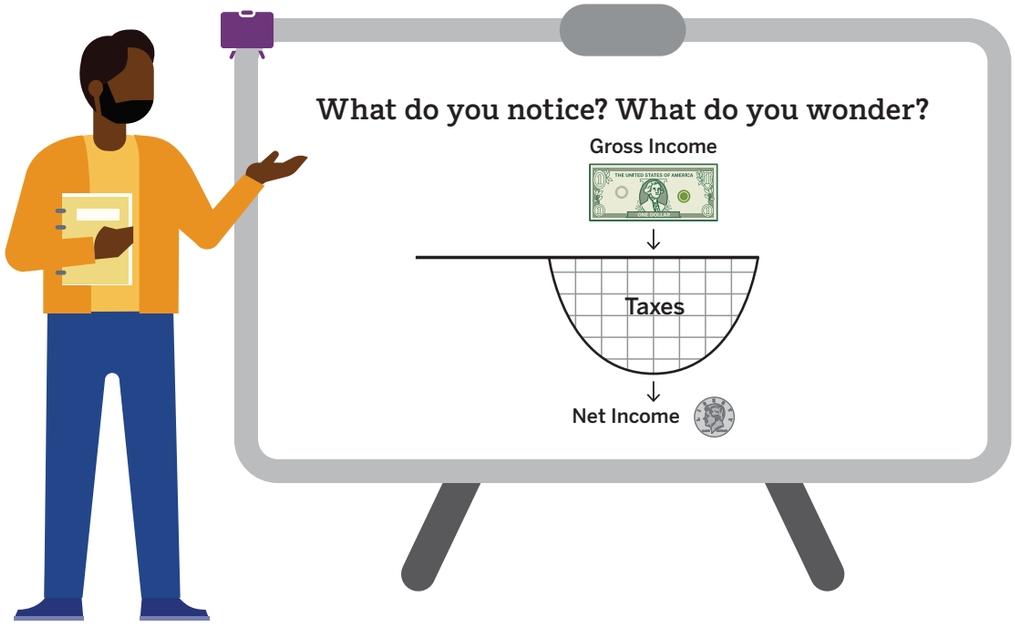
Whole Class | 10 min

Presentation Screens



Warm-Up Notice and Wonder

Purpose: Students examine an image showing gross income, taxes, and net income to activate their prior knowledge of income and taxes.



1 Launch

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.

Say, "**Gross income** is the total amount of money you receive from wages and other sources before taxes are deducted or paid. Taxes are then paid or *deducted* from gross income, resulting in **net income**, or the amount of money you have left after taxes."

Record the definitions on chart paper to be displayed during the lesson.



Students might say . . . ELPS 2.B

I notice that there is more money with gross income than there is with net income.

I notice that the net is labeled taxes and is showing money being filtered out for taxes.

I wonder how much money goes to taxes.

I wonder what the different types of taxes are.

Small Groups | 20 min

Activity 1 Where'd My Money Go?

Purpose: Students identify different tax types from real-world scenarios to relate to the concept of net income.

Presentation Screens



Materials

Lesson Resources:

- Display the Activity 1 PDF around the room during the Launch.

Classroom materials:

- Use chart paper and markers to prepare the *Tax Types* chart before the activity. Display the *Tax Types* chart during the Connect.

Short on time? Consider going through the scenarios as a whole group.

1 Launch



Say, "Andrea is learning about jobs at Career Day at her school. She overhears an adult talking about taxes and becomes curious."

Use the Think-Pair-Share routine. Ask, "What do you know about taxes?"

Say:

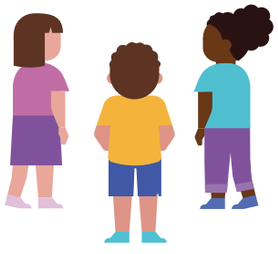
- (if not mentioned in the discussion) "A tax is money paid to the government to help pay for things people need."
- "Around the room are scenarios involving different types of taxes that Andrea has researched."

Read aloud the Activity 1 PDF directions.

Say, "Record your answers in the table for Problem 1. Then complete Problems 2–5 with your partner."

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together as they complete this activity. ELPS 1.E, 2.C, 2.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, "What is the key information in the scenario?"
- Ask, "How could you use that information to help you identify the tax?"

3 Connect



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

Use the Think-Pair-Share routine. Ask, "How do these types of taxes affect your gross and net income?"

Record the definitions of each type of tax on the *Tax Types* chart under columns gross and net income.

A **Accessibility: Conceptual processing** Clarify vocabulary by displaying the terms *income tax, property tax, payroll tax, and sales tax,* along with their definitions and examples of each.

Key Takeaway: Say, "Taxes are money paid to the government by individuals and businesses to fund public services. **Income tax**, **payroll tax**, and **property tax** come out of your gross income, while **sales tax** applies to purchases."

Student Edition

Unit 3
Lesson
14

Name _____ Date _____

TEKS 5.1.A, 5.1.D, 5.10.A, 5.10.B

Money, Money, Money!

Let's calculate income and identify taxes.



Warm-Up eyes on teacher

We are a math community. What can you do to create a fun and safe math community?

Activity 1

Where'd My Money Go?

1 Record your answer to each scenario in the table.

Scenario	Tax
Clare bought a slice of veggie pizza. The slice cost $3.50. After tax was applied, the total cost was $3.72.	sales tax
Shawn's **gross income** gets taxed and deducted from his paycheck.	payroll tax
Each year, Priya pays a tax on the farmland that she owns.	property tax
Diego pays a tax on the money, or income, that he receives. This tax is used to fund public services.	income tax

Activity 1

Name _____ Date _____

Where'd My Money Go? (continued)

2 Discuss Oral activity: No writing expected. Sample response shown.
How is **sales tax** different from **income tax**, **payroll tax**, and **property tax**?
Sales tax is different because it is not taken out of your gross income but is added to purchases.

Show your thinking.

3 Jada earns $25 per hour and works 40 hours per week. What is Jada's weekly gross income?
Sample work shown.

```
  2
 25
×40
 00
+1000
1,000
```

answer: $1,000

4 If $65.10 is taken out of Jada's gross weekly income for taxes, what is her weekly **net income**? Use Jada's gross income from Problem 3.

```
1000.00  ← gross income
-  65.10 ← taxes
 934.90  ← net income
```

answer: $934.90

5 Explain the difference between gross income and net income.
Sample response shown.
Gross income is the income someone earns before taxes. Net income is gross income minus taxes.

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify sales tax using the definition.	Sales tax is a tax that is added to the cost of a purchase.	**Support** Ask, "How could you use the definitions of income tax, property tax, and payroll tax to understand the difference?"
Identify sales tax and compare it to the other types of taxes.	Sales tax is different because it is not taken out of your gross income. Sales tax gets added to purchases you make.	**Stretch** Ask, "What other factors could affect gross or net income?"

Pairs | 15 min

Activity 2 Gross Income vs. Net Income

Purpose: Students differentiate between gross and net income to explore how they affect financial decisions in real-world scenarios.

Presentation Screens



Materials

Classroom materials:

- Display and reference the *Tax Types* chart during the Activity.

Short on time? Consider omitting Problems 6 and 7.

1 Launch



Say, "After learning about taxes, Andrea began to wonder how much she might make as an inventor (her dream job when she grows up) and how taxes might affect this income. You are going to work with a partner to help Andrea calculate her possible gross income and net income.

Display the *Tax Types* chart to be referenced during the lesson.

Have students complete Problems 6–13.

MLR **MLR1: Stronger and Clearer Each Time** ELPS 1.E, 2.E

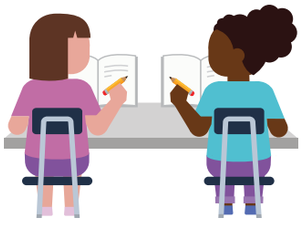
After students complete Problem 8, have pairs meet with another pair to share their responses. Encourage listeners to ask clarifying questions using stems, such as:

- "What do you mean by . . .?"
- "Could you tell me more about . . .?"

Have students revise their responses based on the feedback they receive.

EB **Emergent Bilinguals** Encourage students to use gestures or hand motions to help them describe the new terms. ELPS 1.B

2 Monitor



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

If students need help getting started . . .

- Ask, "What information do you know from the problem?"
- Ask, "How do you determine the gross income?"

3 Connect



Invite students to share their responses for Problem 8.

Record what is discussed about the importance of knowing the difference on the class *Definitions* chart from the Launch.

Key Takeaway: Say, "Gross income is the total amount of money you earn from wages paid for performing a job before any deductions. Net income is the amount of money left after deducting taxes from gross income. Understanding the difference is important when making financial decisions."

Student Edition

Activity 2

Name _____ Date _____

Gross Income vs. Net Income

Show your thinking. Sample work shown.

6 If Andrea makes $32 an hour as an inventor and works 8 hours a day and 28 days per month, what would her monthly gross income be?

$$\begin{array}{r} {\scriptstyle 6} \\ 28 \\ \times \quad 8 \\ \hline 224 \end{array} \qquad \begin{array}{r} {\scriptstyle 1} \\ 224 \\ \times \quad 32 \\ \hline 448 \\ +\ 6720 \\ \hline 7,168 \end{array}$$

answer: $7,168

7 If $548.35 is deducted from Andrea's income for taxes each month, what is her net income? Use Andrea's gross income from Problem 6.

$$\begin{array}{r} 7,168.00 \\ -\ \ 548.35 \\ \hline 6,619.65 \end{array}$$

answer: $6,619.65

8 Why is it important to understand the difference between gross income and net income? Explain your thinking. Sample response shown.

It is important to understand the difference between gross income and net income so that you know how much money you actually have to spend.

Name _____ Date _____

Gross Income vs. Net Income (continued)

For Problems 9 and 10, use the word bank to write the term that matches the definition for the tax that could be taken out of Andrea's income.

income tax	payroll tax	property tax	sales tax

9 A tax paid on money received, including money from wages and other sources.

income tax

10 A tax paid on property such as houses and land.

property tax

11 Gil cannot wait to get a job and earn money when he grows up. When he gets his first paycheck, Gil expects that it will include his gross income and deductions for taxes. What are the taxes that will be deducted from Gil's paycheck called?

(A) income tax (B) payroll tax (C) property tax (D) sales tax

12 As working adults, Andrea and Gil plan to go out to lunch every Friday to catch up. Which tax will be added to their bill?

(A) income tax (B) payroll tax (C) property tax (D) sales tax

13 Andrea tells Gil that net income is always less than gross income. Do you *agree* or *disagree*? Explain your thinking.
Sample explanation shown.

I agree. Net income will always be less than gross income because taxes are taken out of gross income to calculate net income.

Presentation Screens

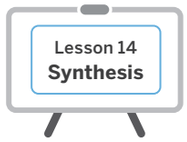
D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Explains the importance using the definitions of each term.	*It is important to understand the difference between gross income and net income because gross income is the amount of money you make before taxes and net income is the amount of money left after taxes.*	**Support** Ask, "How would knowing the meaning of each term help you make financial decisions?"
Explains the importance of being able to understand how much money you have left to spend.	*It is important to understand the difference between gross income and net income so that you know how much money you actually have to spend.*	**Stretch** Ask, "Why is it important to know your gross income?"
Explains the importance of being able to understand how much money you make before taxes and how much money you have left to spend.	*It is important to understand the difference between gross income and net income so that you know how much money you have to pay in taxes and how much money you actually have to spend.*	**Stretch** Ask, "Which income would you use to make a budget? Why? What would the other income help you budget for?"

Whole Class | 10 min

Synthesis

Presentation Screens



Lesson Takeaway: **Gross income** is money received from wages and other sources before taxes are deducted or paid. **Net income** is gross income minus taxes and deductions.



Say, "Gross income is money received from wages and other sources. Net income is gross income minus taxes and deductions."

Use the Think-Pair-Share routine. Ask, "Is gross income or net income more useful when making spending decisions? Why?"

Say (if not yet mentioned during discussion), "It is important to understand that you will not receive all of the money from your gross income. Net income is an accurate calculation of the amount of money you will receive after taxes have been paid. Income tax, payroll tax, and property tax are all taken out of your gross income, while sales tax is added to your purchases."

Formalize vocabulary: gross income, income tax, net income, payroll tax, property tax, sales tax

(optional) **Consider using the Word Structure: Compound Words routine** with the terms *gross income*, *income tax*, *net income*, *payroll tax*, *property tax*, and *sales tax*. Consider asking, "How can you use your understanding of each individual word to help you remember what each of these terms mean?" **ELPS 1.B, 3.C, 3.F**

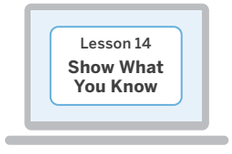
Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

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

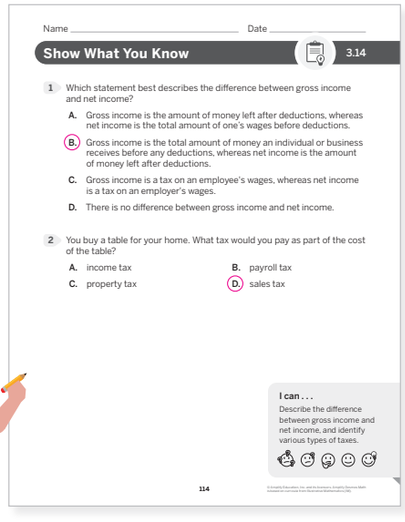
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.14

1 Which statement best describes the difference between gross income and net income?

A. Gross income is the amount of money left after deductions, whereas net income is the total amount of one's wages before deductions.

B. Gross income is the total amount of money an individual or business receives before any deductions, whereas net income is the amount of money left after deductions.

C. Gross income is a tax on an employee's wages, whereas net income is a tax on an employer's wages.

D. There is no difference between gross income and net income.

2 You buy a table for your home. What tax would you pay as part of the cost of the table?

A. income tax B. payroll tax

C. property tax D. sales tax

I can . . .
Describe the difference between gross income and net income, and identify various types of taxes.

114

Today's Goals

1. **Goal:** Apply mathematical operations to calculate gross income and net income.
2. **Language Goal:** Define income tax, payroll tax, sales tax and property tax. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**
   - In Problem 2 in the *Show What You Know*, students selected the term defined.
3. **Language Goal:** Explain the difference between gross income and net income. **(Listening, Speaking, and Writing)** **ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F**
   - In Problem 1 in the *Show What You Know*, students chose the best answer to describe the difference between gross income and net income.

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 including connections to assessment practice, and ongoing spiral review.

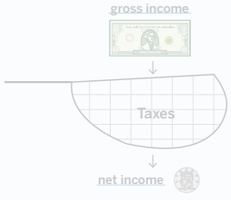
Lesson 14
Practice

Students using digital

Students using print

Summary 3.14

Net income is the amount of money that is left after taxes have been deducted from gross income.



net income The total amount of money left after taxes are deducted.

Practice 3.14

1 Jada earns $15 an hour at her job. If she works for 36 hours this month, which statement about her monthly income is *true*?

- (A) Her gross income is less than $540.
- (B) Her net income is less than $540.
- (C) Her gross income is more than $540.
- (D) Her net income is more than $540.

2 Describe a situation in which you had to pay sales tax.
Sample response shown.
I bought a video game and money was added to the total.

Practice 3.14

Name _____ Date _____

3 Match each vocabulary word with its definition.

Vocabulary		Definition
A. net income	C	a tax on income received from wages and other sources
B. payroll tax	A	total amount of money left after taxes are deducted
C. income tax	B	a tax deducted from a paycheck based on wages earned
D. gross income	F	a tax paid on goods and services
E. property tax	D	money received from wages and other sources before taxes are deducted or paid
F. sales tax	E	a tax paid on property that is owned, such as land

Practice 3.14

Name _____ Date _____

Spiral Review

4 Which best describes the difference between fixed expenses and variable expenses?

- (A) Fixed expenses stay the same, whereas variable expenses can change.
- (B) Variable expenses stay the same, whereas fixed expenses can change.
- (C) Both fixed expenses and variable expenses can change.
- (D) Both fixed expenses and variable expenses stay the same.

Use the table for Problems 5 and 6.

Expenses	February	March	April
phone service	$64.15	$64.15	$64.15
TV streaming	$40.00	$40.00	$40.00
groceries	$35.85	$72.19	$43.12

5 Circle the expenses that are fixed. **Correct response shown on the table.**

6 How much money is needed to pay the expenses in February?

Show your thinking.
Sample work shown.

$$\begin{array}{r} 64.15 \\ +\ 40.00 \\ \hline 104.15 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\,1\,1} \\ 104.15 \\ +\ 35.85 \\ \hline 140.00 \end{array}$$

answer: $140.00

For Problems 7–10, evaluate the expression.

7 50 × 90 4,500

8 80 × 60 4,800

9 60 × 70 4,200

10 40 × 70 2,800

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-lesson			
Test Practice	1	2	5.10.B
	2	1	5.10.A
	3	1	5.10.A, 5.10.B
Spiral Review			
	4, 5	1	4.10.A
Fluency	6	1	4.4.A
Fluency	7–10	1	4.4.D

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: Explain the difference between gross income and net income.

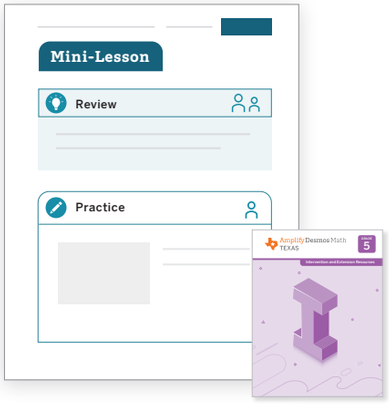
Support

Provide targeted intervention for students by using these resources.

If students define gross and net income:

Respond:

- Assign the *Identifying Types of Income and Taxes* 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.



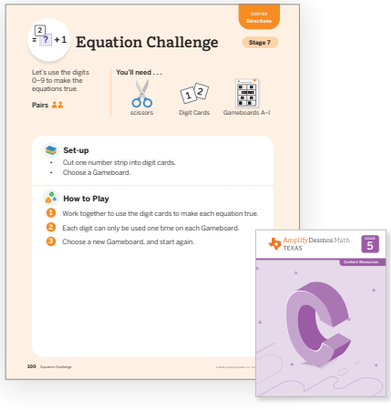
Strengthen

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

If students explain the difference between gross and net income:

Respond:

- Invite students to play the **Center**. | 15 min
  Equation Challenge: Add and Subtract Beyond 1,000
- Have students complete **Lesson 14 Practice.** | 15 min
- **Item Bank**



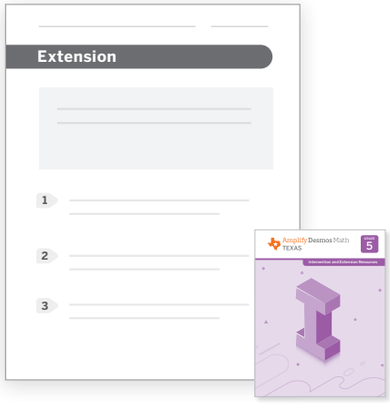
Stretch

Challenge students and extend their learning with these resources.

If students explain the importance of being able to understand how much money you make before taxes and how much money you have left to spend:

Respond:

- Invite students to explore the **Sub-Unit 4 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



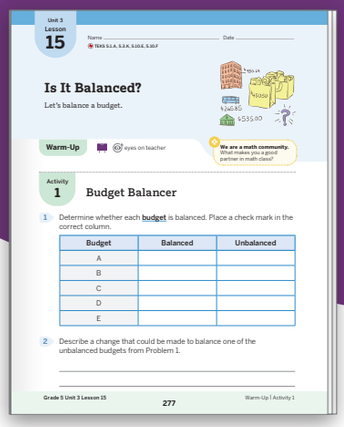


Professional Learning

Reflect on the opportunities students have to notice and wonder about gross and net income in the real world. How could you support students with noticing and describing income and taxes they see in their school and community?

Unit 3
Lesson
15

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



Is It Balanced?

Making and Balancing a Budget

Let's calculate expenses.

Key Concepts

Today's Goals

1. **Goal:** Add and subtract whole numbers and decimals to balance a budget.
2. **Language Goal:** Describe actions that might be taken to balance a budget when expenses exceed income. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**

Connections and Coherence

Students are introduced to the concept of a **balanced budget** and apply their understanding of addition and subtraction of whole numbers and decimals to determine whether expenses exceed income. They describe actions that might be taken to balance a budget when expenses exceed income. **(TEKS 5.1.A)**

Prior Learning

In Lesson 14, students used their knowledge of different tax types to calculate net income from gross income.

Future Learning

In Lesson 17, students will use financial records to track withdrawals and deposits.

Integrating Rigor in Student Thinking

- Students build their **conceptual understanding** of a balanced budget.
- Students strengthen their **fluency** with adding and subtracting whole numbers and decimals.

Vocabulary

New Vocabulary

balanced budget

budget

Review Vocabulary

expenses

gross income

net income

TEKS

Addressing

5.10.E

Describe actions that might be taken to balance a budget when expenses exceed income.

Also Addressing: **5.3.K, 5.10.F**

Math Process Standards: 5.1.A

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

Building On	Building Toward
4.4.A	6.14.C

Building Math Identity

We are a math community.
What makes you a good partner in math class?

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

Lesson at a Glance

60 min

TEKS: 5.1.A, 5.3.K, 5.10.E, 5.10.F

Warm-Up

Whole Class | 10 min

Students use the **Notice and Wonder** routine to share what they notice and wonder about a budget where expenses are equal to net income. The terms **budget** and **balanced budget** are introduced in the Connect.

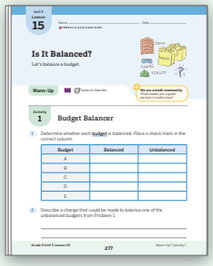


Activity 1

Pairs | 15 min

Students explore budget scenarios and identify balanced budgets. They use the **Think-Pair-Share** routine to discuss their strategies for determining whether a budget is balanced. Students then balance a simple budget by calculating the total cost of expenses and the amount of net income remaining.

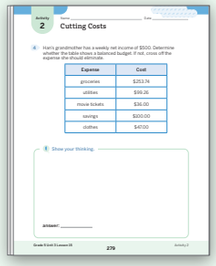
Materials: Activity 1 PDF, chart paper



Activity 2

Pairs | 20 min

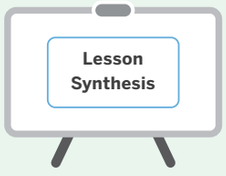
Students use the **Think-Pair-Share** routine to discuss actions to balance a budget when expenses exceed income. They analyze a budget and take action to balance the budget if needed.



Synthesis

Whole Class | 10 min

Students review and reflect on the purpose of a balanced budget and the actions they can take to eliminate expenses.

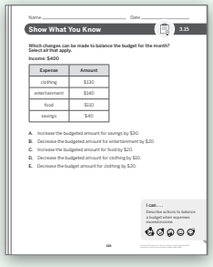


Show What You Know

Independent | 5 min

Students demonstrate their understanding of a balanced budget by describing actions they should take when expenses exceed income.

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
- ✓ 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.

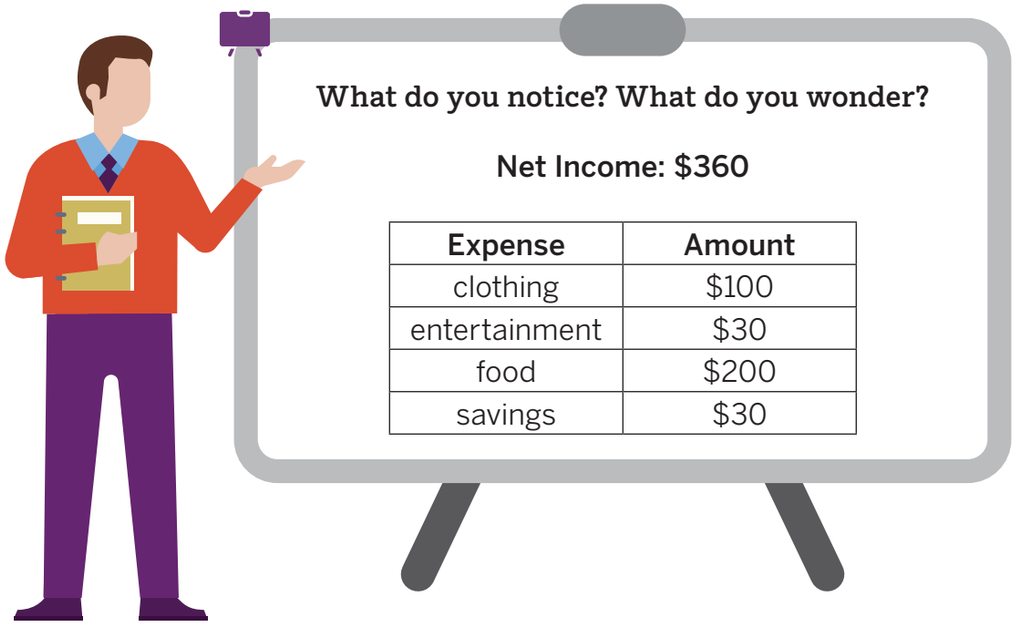
Whole Class | 10 min

Presentation Screens



Warm-Up Notice and Wonder

Purpose: Students examine an image to introduce the concept of a budget.



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?"

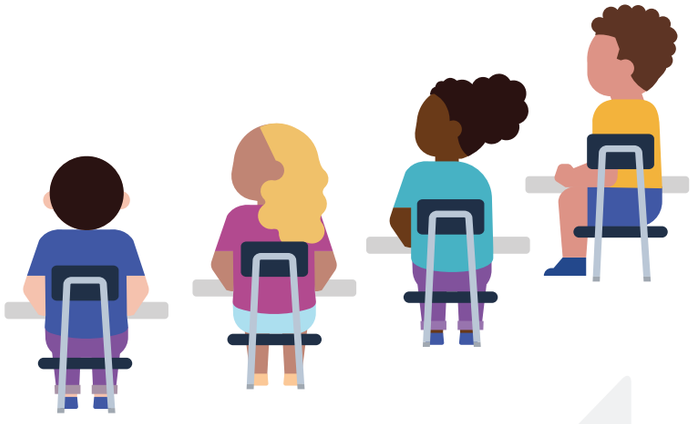
2 Connect

Record students' responses as they share.

Ask, "Why are net income and total expenses equal?"

Define budget as a plan for spending income on expenses.

Say, "If the net income is equal to the total of the expenses, it is called a **balanced budget**."



Students might say . . . ELPS 2.B

I notice that this is a budget with net income split into expenses.

I notice that the net income and total spending are the same.

I wonder how they decided on these amounts.

I wonder why the cost of the expenses adds to $360.

Pairs | 15 min

Activity 1 Budget Balancer

Purpose: Students add and subtract with whole numbers and decimals to determine whether expenses exceed income in a budget.

Presentation Screens



Materials

Classroom materials:
Lesson Resources:
- Display the Activity 1 PDF around the room during the Launch.
- Provide paper at each display for students to use for calculations in Activity 1.

Short on time? Consider having students explore only Budgets A and B.

1 Launch



Say, "You and your partner will move around the room to each budget scenario, thinking about whether each budget is balanced. You will complete Problems 1 and 2 with your partner."

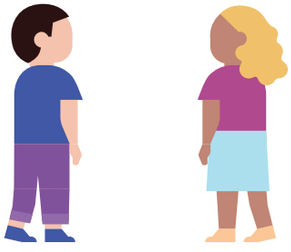
Have students pause after completing Problems 1 and 2.

Use the Think-Pair-Share routine. Ask, "How did you determine which budgets were balanced?"

A **Accessibility: Memory and attention** Provide students the worked-out total cost of the expenses.

Have students complete Problem 3 independently.

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 need to calculate first?"
- Ask, "How could you determine the missing amount?"

3 Connect



Invite students to share their responses from Problem 3.

Use the Think-Pair-Share routine. Ask, "How did you determine the amount of money to put in the Other category?"

MLR **MLR8: Discussion Supports — Sentence Frames** ELPS 1.E, 2.C, 2.E

While students share their responses, display these sentence frames to support discussion.
- "We determined the amount by . . ."
- "I added . . ."
- "I subtracted . . ."

Key Takeaway: Say, "You can add your expenses together and subtract them from the net income to determine whether a budget is balanced. When expenses and income are equal, you have a balanced budget."

Student Edition

Unit 3
Lesson
15

Name _____ Date _____

TEKS 5.1.A, 5.3.K, 5.10.E, 5.10.F

Is It Balanced?

Let's calculate expenses.



Warm-Up eyes on teacher

We are a math community. What makes you a good partner in math class?

Activity
1

Budget Balancer

1 Determine whether each **budget** is balanced. Place a check mark in the correct column.

Budget	Balanced	Unbalanced
A		✓
B		✓
C		✓
D	✓	
E		✓

2 Describe a change that could be made to balance one of the unbalanced budgets from Problem 1. Sample response shown.

Budget B's expenses added to $1,950. They could take entertainment out of their budget.

Activity
1

Name _____ Date _____

Budget Balancer (continued)

3 The monthly income for Andrea's mom during October was $2,479.66. The table shows an incomplete budget. Complete the table to show a **balanced budget**.

Expense	Amount
rent	$950.24
transportation	$265.85
food	$450.50
savings	$535.00
other	$278.07

Show your thinking.

Sample work shown.

```
  2 1 1                 5 16
  9 5 0 . 2 4       2,4 7 9 . 6 6
  2 6 5 . 8 5     - 2,2 0 1 . 5 9
  4 5 0 . 5 0         2 7 8 . 0 7
+ 5 3 5 . 0 0
  2,2 0 1 . 5 9
```

answer: $278.07

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify the missing amount as the total of the expenses listed in the table.	Expense / Amount rent $950.24 transportation $265.85 food $450.50 savings $535.00 other $2,201.59	**Support** Ask, "The total of all the expenses will be equal to the income in a balanced budget. How did you determine the amount for this expense?"
Identify the missing amount as the total expenses subtracted from the net income.	Expense / Amount rent $950.24 transportation $265.85 food $450.50 savings $535.00 other $278.07	**Stretch** Ask, "If they wanted to spend $95 on new clothes, how much money would remain in the *other* category?"

Pairs | 20 min

Activity 2 Cutting Costs

Purpose: Students describe actions that can be taken to balance a budget.

Presentation Screens



1 Launch



Use the Think-Pair-Share routine. Ask, "Which expense categories would you choose to revise? Why?"

Say:

- "When a budget is not balanced, actions must be taken to decrease some of the unnecessary expenses."
- "You will complete Problem 4 with your partner and Problems 5 and 6 independently."

EB **Emergent Bilinguals** If possible, pair students with different levels of English language proficiency together as they complete this activity. ELPS 1.E, 2.C, 2.D

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 could you determine whether the budget is balanced?"
- Ask, "What should you consider before you eliminate or decrease an expense?"

3 Connect



Invite students to share their responses and strategies from Problem 4. Select and sequence their responses in the order shown in the *Differentiation* table.

Use the Think-Pair-Share routine. Ask, "How did you determine which expense to eliminate from the budget? Why?"

Say (if not yet mentioned during the discussion), "There are many ways to adjust your spending to balance a budget. It is important to think about the types of expenses you have and whether they are necessary before determining how to balance your budget."

Key Takeaway: Say, "To have a balanced budget, your expenses and your income must be equal, or balanced. When a budget is not balanced, you can choose to eliminate or decrease unnecessary expenses or try to increase income."

Activity 2

Name _____ Date _____

Cutting Costs

4 Han's grandmother has a weekly net income of $500. Determine whether the table shows a balanced budget. If not, cross off the expense she should eliminate.

Expense	Cost
groceries	$253.74
utilities	$99.26
~~movie tickets~~	~~$36.00~~
savings	$100.00
clothes	$47.00

Show your thinking.

Sample work shown.

```
 2 2 1  1
 2 5 3 . 7 4
   9 9 . 2 6
   3 6 . 0 0
 1 0 0 . 0 0
+  4 7 . 0 0
 5 3 6 . 0 0
```

answer: $536.00

Activity 2

Name _____ Date _____

Cutting Costs (continued)

Expense	Amount
cell phone	$60
gym membership	$40
entertainment	$65
food	$80
savings	$75

5 Han's brother earned $280 this week. He made a list of his expenses. Describe a change he could make to have a balanced budget for the week.

Sample response shown.

Gi's brother is $40 over his income for the week. To have a balanced budget, he could spend $25 on entertainment instead of $65.

6 This month, Gil's expenses are greater than his income. What actions could he take to balance his budget?

(A) increase expenses and decrease income
(B) decrease expenses and decrease income
(C) decrease expenses and increase income
(D) increase expenses and increase income

Presentation Screens

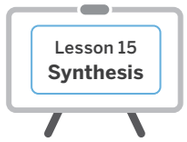
Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Determine that the expenses do not exceed the weekly net income.	*The total cost is less than $500. That means that she could actually buy everything in her budget and add more money to her savings.*	**Support** Ask, "How did you determine the amount of money spent on expenses?"
Almost there Determine that the expenses exceed the weekly net income and eliminate a necessary expense.	*The total cost is $536, which is $36.00 over her weekly income. She should take some money out of her utility costs.*	**Strengthen** Ask, "How did you determine which expense to eliminate? Which expenses do you see that aren't important?"
Determine that the expenses exceed the weekly net income and eliminate unnecessary expenses.	*The total cost is $536, which is $36 over her weekly income. She should not buy movie tickets.*	**Stretch** Ask, "How could you balance the budget without eliminating any expenses?"

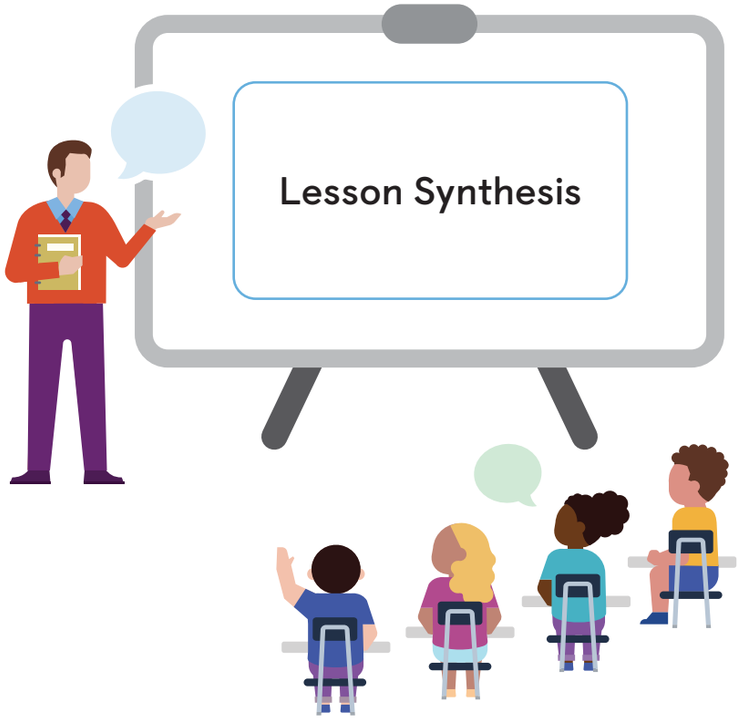
Whole Class | 10 min

Synthesis

Presentation Screens



Lesson Takeaway: Balancing a budget is important because it ensures that spending does not exceed income. Balancing a budget may require reducing expenses.



Say, "Today, you balanced a budget by calculating expenses and determining whether they exceeded income."

Use the Think-Pair-Share routine. Ask, "Do you agree with the action taken to balance this budget? Why or why not? What action could be taken instead?"

Say, "You can determine expenses to eliminate from your budget based on whether the expense is a want or a need."

Formalize vocabulary: budget, balanced budget

(optional) Consider using the **Word Structure: Compound Words routine** with the term *balanced budget*. Consider asking, "How can you use your understanding of the words *budget* and *balance* to help you understand the term *balanced budget*?" ELPS 1.B, 3.C, 3.F

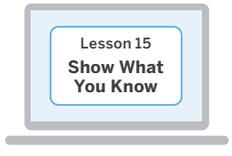
Refer to the Math Language Development Resources for a description of this routine and for more vocabulary support.

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

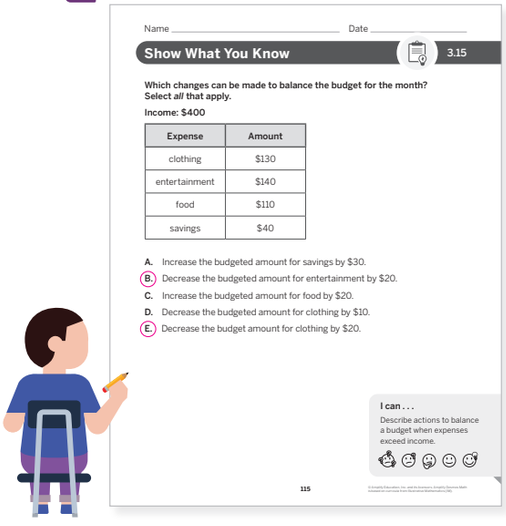
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.15

Which changes can be made to balance the budget for the month? Select *all* that apply.

Income: $400

Expense	Amount
clothing	$130
entertainment	$140
food	$110
savings	$40

A. Increase the budgeted amount for savings by $30.
B. Decrease the budgeted amount for entertainment by $20.
C. Increase the budgeted amount for food by $20.
D. Decrease the budgeted amount for clothing by $10.
E. Decrease the budget amount for clothing by $20.

I can . . .
Describe actions to balance a budget when expenses exceed income.

115

Today's Goals

1. **Goal:** Add and subtract whole numbers and decimals to balance a budget.
2. **Language Goal:** Describe actions that might be taken to balance a budget when expenses exceed income. **(Listening and Speaking)** ELPS 1.B, 2.B, 2.E
   - In the *Show What You Know*, students determined an action that might be taken to balance a budget.

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 including connections to assessment practice, and ongoing spiral review.

Lesson 15
Practice

Students using digital

Students using print

Summary 3.15

When you create a **balanced budget**, you want to make sure your expenses are equal to your income. If your expenses exceed your income, you can identify ways to adjust your budget.

balanced budget A plan for spending in which the expenses equal the net income.

Practice 3.15

1 Priya made $200 doing chores for the month. How much remaining income does she have for entertainment expenses?

Expense	Amount
clothing	$40.17
food	$50.29
savings	$65.81
entertainment	$43.73

Practice 3.15

Name _____ Date _____

2 Andrea's expenses and income are shown in the chart.

Andrea's Budget

Income		Expenses	
lawn mowing	$20.00	clothes	$20.00
babysitting	$35.00	food	$60.00
tutoring	$40.00	entertainment	$40.00
garage sale	$55.00		

Based on the budget, what is the greatest amount of money Andrea can spend on markers for an art project and still achieve a balanced budget?

(A) $10 (B) $20
(C) $30 (D) $40

3 Andrea's sister has a net income of $1,300. Based on her list of expenses, what change could her sister make to balance her budget?

Expense	Amount
food	$250
rent	$800
savings	$130
clothing	$150

(A) increase her food costs by $30 (B) increase her clothing costs by $70
(C) decrease her food costs by $70 (D) decrease her clothing costs by $30

Practice 3.15

Name _____ Date _____

Spiral Review

For Problems 4–9, determine the product. Sample work shown.

Show your thinking.

4 12 × 11

$$\begin{array}{r} 1 \\ 12 \\ \times\ 11 \\ \hline 12 \\ +\ 120 \\ \hline 132 \end{array}$$

answer: 132

5 20 × 15

$$\begin{array}{r} 20 \\ \times\ 15 \\ \hline 100 \\ +\ 200 \\ \hline 300 \end{array}$$

answer: 300

6 35 × 10

$$\begin{array}{r} 35 \\ \times\ 10 \\ \hline 350 \end{array}$$

answer: 350

7 20 × 12

$$\begin{array}{r} 20 \\ \times\ 12 \\ \hline 40 \\ +\ 200 \\ \hline 240 \end{array}$$

answer: 240

8 12 × 18

$$\begin{array}{r} 1 \\ 12 \\ \times\ 18 \\ \hline 196 \\ +\ 120 \\ \hline 216 \end{array}$$

answer: 216

9 28 × 14

$$\begin{array}{r} 3 \\ 28 \\ \times\ 14 \\ \hline 112 \\ +\ 280 \\ \hline 392 \end{array}$$

answer: 392

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-lesson			
	1	2	5.10.F
Test Practice	2	2	5.10.F
	3	2	5.10.E
Spiral Review			
Fluency	4–9	1	4.4.D

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: Describe actions that might be taken to balance a budget when expenses exceed income.

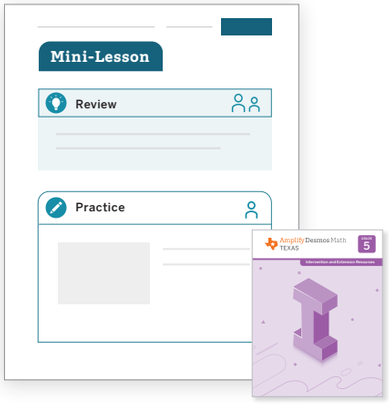
Support

Provide targeted intervention for students by using these resources.

If students determine that the expenses do not exceed the weekly net income:

Respond:

- Assign the *Balancing a Budget* Mini-Lesson. | 15 min
- Review the differences between income and expenses.



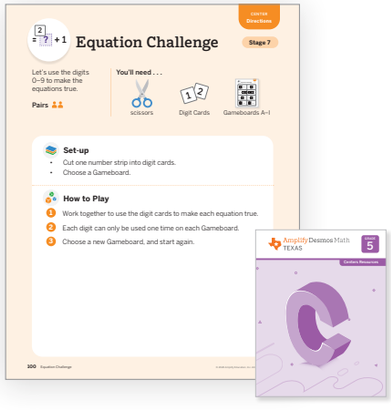
Strengthen

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

If students determine that the expenses exceed the weekly net income and 1 way to balance the budget:

Respond:

- Invite students to play the **Center. |** 15 min
  Equation Challenge: Add and Subtract Beyond 1,000
- Have students complete **Lesson 15 Practice. |** 15 min
- **Item Bank**



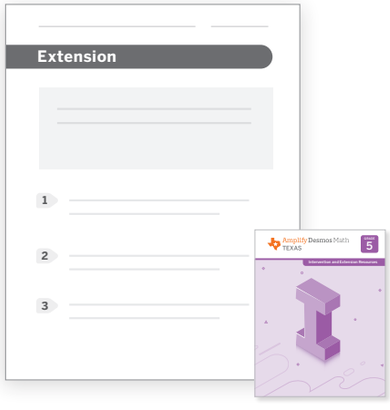
Stretch

Challenge students and extend their learning with these resources.

If students determine that the expenses exceed the weekly net income and identify more than 1 way to eliminate unnecessary expenses:

Respond:

- Invite students to explore the **Sub-Unit 4 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

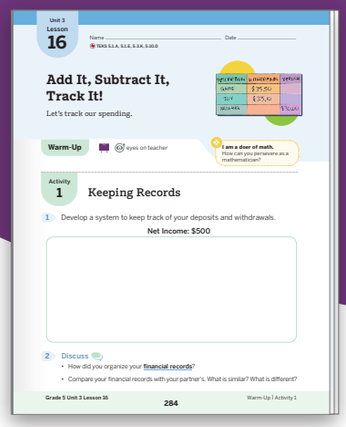


Professional Learning

What did you observe about your students during discussion time? What are some ways that you could learn more about your students to feel more inclusive in your math lesson?

Unit 3
Lesson
16

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



Add It, Subtract It, Track It!

Creating Strategies to Keep Financial Records

Let's track our spending.

Key Concepts

Today's Goals

1. **Goal:** Develop a system for keeping and using financial records.
2. **Language Goal:** Explain the benefit of using financial records. **(Listening and Speaking)** **ELPS 1.B, 2.B, 2.E**

Connections and Coherence

Students apply their knowledge of budgeting to develop a system for keeping and using **financial records**. They strengthen their fluency of operations involving whole numbers and decimals to calculate expenses, income, and account balance. Students analyze trends that appear within financial records to determine the best financial solutions for problems arising in everyday life. **(TEKS 5.1.A, 5.1.E)**

Prior Learning

In Grade 4, students learned about financial institutions and depositing and withdrawing money from a bank.

Future Learning

In Grade 6, students will balance a check register that includes deposits, withdrawals, and transfers.

Integrating Rigor in Student Thinking

- Students **apply** what they know about withdrawals and deposits to develop financial records.
- Students develop their **conceptual understanding** of what goes into financial records.
- Students strengthen their **fluency** of adding and subtracting whole numbers and decimals.

Vocabulary

New Vocabulary

financial records

Review Vocabulary

balanced budget

deposit

withdrawal

TEKS

Addressing

5.10.D

Develop a system for keeping and using financial records.

Also Addressing: **5.3.K**

Math Process Standards: 5.1.A, 5.1.E

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

Building Toward

6.14.C

Building Math Identity

I am a doer of math.

How can you persevere as a mathematician?

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, 5.3.K, 5.10.D

Warm-Up

Whole Class | 10 min

Students use the **What Do You Know About ____?** routine to share their prior knowledge about deposits and withdrawals. They are introduced to the term **financial records** in the Connect.



Activity 1 Fluency

Pairs | 20 min

Students play *Finance Frenzy* to develop a system to track withdrawals and deposits and calculate account balances.

Manipulative Kit: number cubes
Materials: Activity 1 PDF



Activity 2 Fluency

Pairs | 15 min

Students create a financial record to track Gil's expenses and help him analyze his balance. They then solve problems using a completed financial record to identify trends and financial decisions.

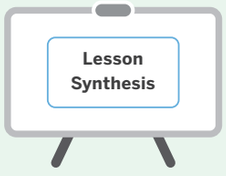
Materials: Activity 2 PDF



Synthesis

Whole Class | 10 min

Students review and reflect on how using financial records can help make responsible financial decisions.

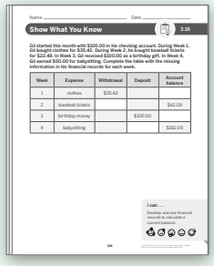


Show What You Know

Independent | 5 min

Students demonstrate their understanding of using a financial record by calculating the account balance after various withdrawals and deposits.

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 ✓ Frayer Model

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.

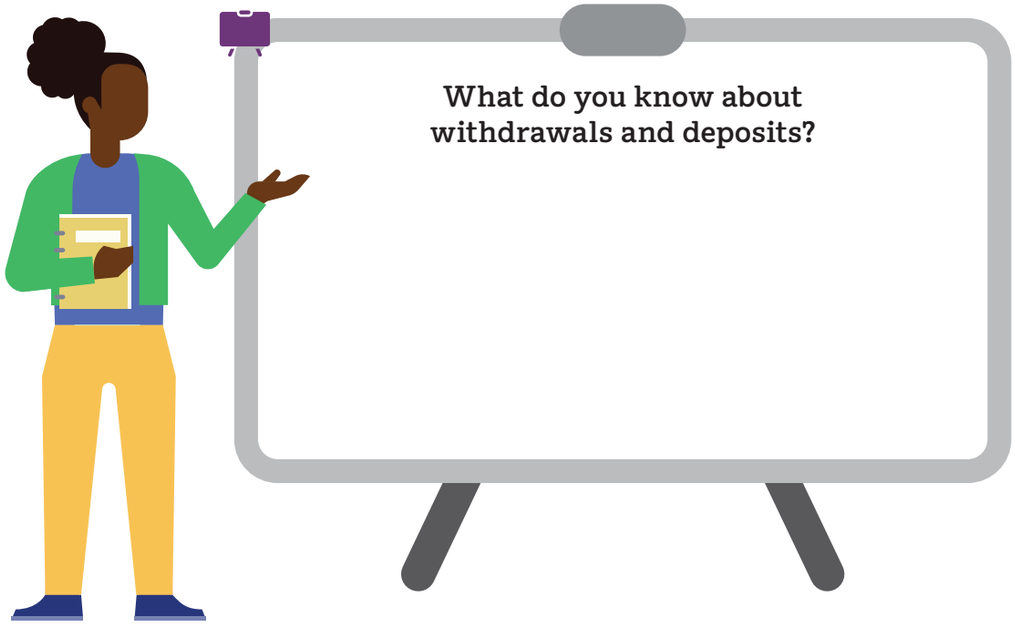
Whole Class | 10 min

Presentation Screens



Warm-Up What Do You Know About _?

Purpose: Students share ideas about withdrawals and deposits to prepare them to develop financial records.



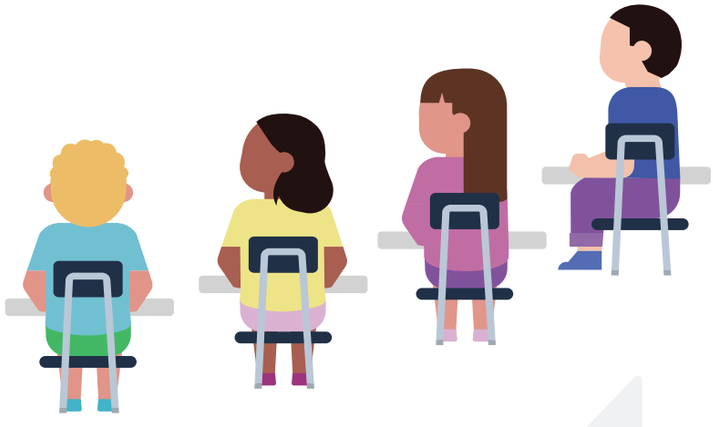
1 Launch

Display the question.

Use the What Do You Know About ___? routine.

Ask, "What do you know about withdrawals and deposits?"

Have students share their responses.



2 Connect

Record students' responses as they share.

Say, "Today you will be creating financial records, which are a system to help keep track of withdrawals and deposits."

Students might say . . . ELPS 1.E, 2.C, 2.D, 2.F

They have to do with money.

I know deposits are money you put into your account, and withdrawals are money you take out of your account.

Depositing money is similar to saving money or earning an income. Withdrawing money is similar to spending.

Pairs | 20 min

Activity 1 Keeping Records

Fluency

Purpose: Students play *Finance Frenzy* to develop a system for keeping financial records.

Presentation Screens



Materials

Lesson Resources:
- Distribute the Activity 1 PDF to each pair during the Launch.

Manipulative Kit:
- Distribute one number cube to each pair during the Launch.

Short on time? Consider omitting Problem 4.

1 Launch



Display the directions for *Finance Frenzy*.

Read aloud the directions.

Have students complete Problems 1 and 2 in pairs, then Problems 3 and 4 independently.

A **Accessibility: Executive functioning** Before students play the game *Finance Frenzy*, demonstrate how to play.

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 information will you need to know to play the game?"
- Ask, "How could you organize the information?"

3 Connect



Invite students to share their responses and strategies from Problem 1. Select and sequence their responses in the order shown in the *Differentiation* table.

Use the Think-Pair-Share routine.

Ask, "How did the system you developed in Problem 1 compare to the financial records in Problem 3? What is important to include in financial records? Why?"

Key Takeaway: Say, "Financial records can be used to keep track of your spending. It is helpful to organize financial records in chronological order, including withdrawals, deposits, and current account balance."

Student Edition

Unit 3
Lesson
16

Name _____ Date _____

TEKS 5.1.A, 5.1.E, 5.3.K, 5.10.D

Add It, Subtract It, Track It!

Let's track our spending.



Warm-Up eyes on teacher

I am a doer of math.
How can you persevere as a mathematician?

Activity 1

Keeping Records

1 Develop a system to keep track of your deposits and withdrawals.
Sample response shown.

Net Income: $500

Amount	Balance
$300	$800
$150	$950
$210	$740
$90	$650
$110	$540

2 Discuss Oral activity: No writing expected.

- How did you organize your financial records?
- Compare your financial records with your partner's. What is similar? What is different?

Activity 1

Name _____ Date _____

Keeping Records (continued)

3 Use the financial record to calculate the account balance.

Day	Description	Withdrawal	Deposit	Account balance
Fri.	video game	$35.50		$85.50
Fri.	toy store	$25.10		$60.40
Sat.	mowing		$30.00	$90.40
Sat.	pizza	$15.75		$74.65
Sun.	chores		$20.00	$94.65

Show your thinking.

Sample work shown.

$$\begin{array}{r} 85.50 \\ -\ 25.10 \\ \hline 60.40 \end{array} \qquad \begin{array}{r} 60.40 \\ +\ 30.00 \\ \hline 90.40 \end{array} \qquad \begin{array}{r} {}^{8}\cancel{9}\,{}^{13}1{}^{10}0 \\ \cancel{90}.\cancel{40} \\ -\ 15.75 \\ \hline 74.65 \end{array} \qquad \begin{array}{r} 74.65 \\ +\ 20.00 \\ \hline 94.65 \end{array}$$

answer: $94.65

Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Include the amount from the round and new balance.	Amount: $95, Balance: $595; Amount: $150, Balance: $745	**Support** Ask, "How do you know if the amount from each round was a withdrawal or deposit? How could you include this information in your financial record?"
Include withdrawal or deposit, the amount, and the new balance.	Deposit ✓, $95, $595; Deposit ✓, $150, $745; Withdrawal ✓, $350, $395	**Strengthen** Ask, "What other category could you add to your financial record to make it easier to determine when each deposit or withdrawal occurred?"
Include the round, whether it was a withdrawal or deposit, the amount, and the new balance.	Round 1, Deposit ✓, $95, $595; Round 2, Deposit ✓, $150, $745; Round 3, Withdrawal ✓, $350, $395	**Stretch** Ask, "How could a financial record be helpful to someone who is trying to stick to their budget?"

Pairs | 15 min

Activity 2 Using Records!

Fluency

Purpose: Students analyze financial records to make sense of income, savings, and spending.

Presentation Screens



Materials

Lesson Resources:

- Distribute the Activity 2 PDF to each pair during the Launch.

1 Launch



Say, "Financial records are not only a way to organize our income and expenses, but they can also give us insight into how we are spending or saving our money."

Say, "After rescuing the ducks with Andrea, Gil has decided he wants a pet rabbit, but he doesn't know if he can afford one. He needs your help organizing his expenses so he can determine if he has enough money."

Read aloud the directions from the Activity 2 PDF.

Have students complete Problems 4–8.

EB **Emergent Bilinguals** Consider inviting pairs to discuss and label whether each item would be a deposit or withdrawal before creating the financial record in Problem 4. ELPS 1.C, 1.E

2 Monitor



While students complete **Problem 7**, refer to the D Differentiation | Teacher Moves table on the following page.

If students need help getting started . . .

- Ask, "What is the problem asking you to do?"
- Ask, "How could you calculate the checking account balance?"

3 Connect



Use the Think-Pair-Share routine. Ask:

- "Why is it important to keep financial records?"
- "What could you learn from analyzing financial records?"

MLR **MLR8: Discussion Supports — Sentence Frames** ELPS 1.E, 2.C, 2.E

Display these sentence frames to support discussion.

- "It is important to keep financial records because _____."
- "You can learn _____ from analyzing financial records."
- "I agree with _____ because . . ."
- "I disagree with _____ because . . ."

Key Takeaway: Say, "Financial records can be used to notice trends in spending and saving. Understanding these trends can be helpful when making financial decisions."

Student Edition

Activity 2

Name _____ Date _____

Using Records!

4 Help Gil develop a financial record to keep track of his spending.

Net Income: $100

Day	Description	Withdrawal	Deposit	Account balance
10/24	Clothes and More	$26.89		$73.11
10/25	yard work		$50.00	$123.11
10/26	Pizza Pizza	$8.09		$115.02
10/27	Games and More	$17.06		$97.96
10/28	Trampoline Fun membership	$35.00		$62.96
10/29	dog sitting		$75.00	$137.96

5 Can Gil afford to buy a pet bunny that costs $65?

yes

6 Discuss

How can financial records be beneficial in helping Gil make financial decisions? Oral activity: No writing expected. Sample response shown.

Keeping a record can be beneficial in making financial decisions so that Gil can see where he is spending money, how much money he is making, and how much he has left to spend.

Activity 2

Name _____ Date _____

Using Records! (continued)

Use the financial record to solve each problem.

Day	Description	Withdrawal	Deposit	Account balance
Mon.	pay insurance bill	$35.65		$84.35
Mon.	pizza restaurant	$25.99		$58.36
Tues.	taco restaurant	$32.15		$26.21
Tues.	paycheck		$220.00	$246.21
Wed.	groceries	$61.75		$184.46
Thurs.	pay rent bill	$150.00		$34.46
Fri.	breakfast restaurant	$8.25		$26.21

Show your thinking. Sample work shown.

7 How much money was spent on food?

$$\begin{array}{r} {\scriptstyle 1\ 1\ \ \ \ } \\ 25.99 \\ +\ 32.15 \\ \hline 58.14 \end{array} \qquad \begin{array}{r} 58.14 \\ +\ 61.75 \\ \hline 119.89 \end{array} \qquad \begin{array}{r} {\scriptstyle 1\ 1\ 1\ \ } \\ 119.89 \\ +\ \ 8.25 \\ \hline 128.14 \end{array}$$

answer: $128.14

8 How much money was used to pay bills?

$$\begin{array}{r} 35.65 \\ +150.00 \\ \hline 185.65 \end{array}$$

answer: $185.65

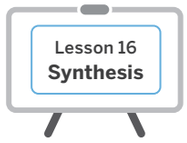
Presentation Screens

D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Calculate the total cost of all withdrawals.	$\begin{array}{r} 35.65 \\ +25.99 \\ \hline 61.64 \end{array}$ $\begin{array}{r} 61.64 \\ +32.15 \\ \hline 93.79 \end{array}$ $\begin{array}{r} 93.79 \\ +\ 61.75 \\ \hline 155.54 \end{array}$ $\begin{array}{r} 155.54 \\ +150.00 \\ \hline 305.64 \end{array}$ $\begin{array}{r} 305.54 \\ +\ \ 8.25 \\ \hline 313.79 \end{array}$	**Support** Ask, "Where does the financial record show the type of expense?"
Calculate the total cost of food expenses.	$\begin{array}{r} {\scriptstyle 1\ 1\ \ \ \ } \\ 25.99 \\ +\ 32.15 \\ \hline 58.14 \end{array}$ $\begin{array}{r} 58.14 \\ +\ 61.75 \\ \hline 119.89 \end{array}$ $\begin{array}{r} {\scriptstyle 1\ 1\ 1\ \ } \\ 119.89 \\ +\ \ 8.25 \\ \hline 128.14 \end{array}$	**Stretch** Ask, "What do you notice and wonder about the amount spent on food this week? How does this affect the account balance?"

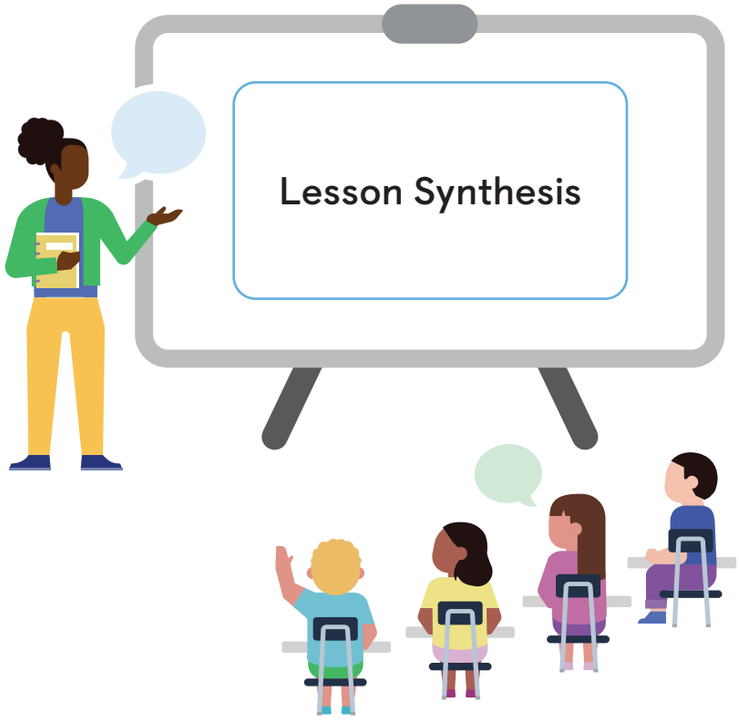
Whole Class | 10 min

Presentation Screens



Synthesis

Lesson Takeaway: Keeping **financial records** that include all the deposits and withdrawals from banking accounts is a helpful way to keep track of money and make informed financial decisions.



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

Use the Think-Pair-Share routine. Ask:

- "What do you notice about these financial records?"
- "Which record could help you make responsible financial decisions? Why?"

Say, "It is important to keep track of how much income you have, how much money you are spending, and how you are spending money in order to anticipate and plan for future expenses. Having a clear system for keeping and using financial records can be helpful when making decisions about spending and saving."

Formalize vocabulary: **Financial records** are a system to help keep track of withdrawals and deposits. (optional)

Consider using the Word Structure: Cognates routine with the term **financial records**. Display or distribute copies of the *English/Spanish Cognates* PDF from the *Math Language Development Resources*. Consider asking, "How are the spellings and pronunciations for the terms *finance* and *finanzas* alike?" Invite students to repeat the terms after you. Repeat for the terms *record* and *recuerdo*. ELPS 1.A, 1.B, 2.A, 3.B, 3.C

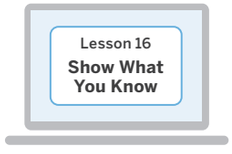
Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

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

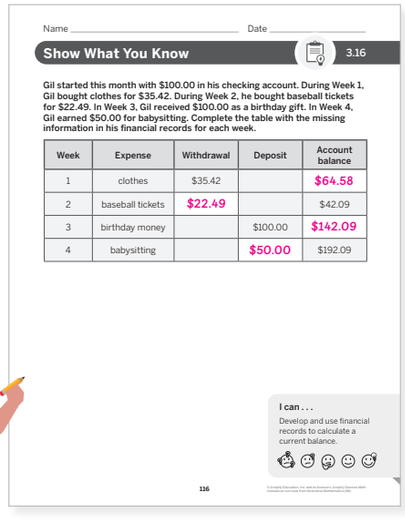
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF



Name _____ Date _____

Show What You Know 3.16

Gil started this month with $100.00 in his checking account. During Week 1, Gil bought clothes for $35.42. During Week 2, he bought baseball tickets for $22.49. In Week 3, Gil received $100.00 as a birthday gift. In Week 4, Gil earned $50.00 for babysitting. Complete the table with the missing information in his financial records for each week.

Week	Expense	Withdrawal	Deposit	Account balance
1	clothes	$35.42		$64.58
2	baseball tickets	$22.49		$42.09
3	birthday money		$100.00	$142.09
4	babysitting		$50.00	$192.09

I can . . .
Develop and use financial records to calculate a current balance.

116



Today's Goals

1. **Goal:** Develop a system for keeping and using financial records.
   - In the *Show What You Know*, students used financial records to calculate deposits, withdrawals, and account balances.
2. **Language Goal:** Explain the benefit of using financial records. **(Listening and Speaking).** ELPS 1.B, 2.B, 2.E

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.

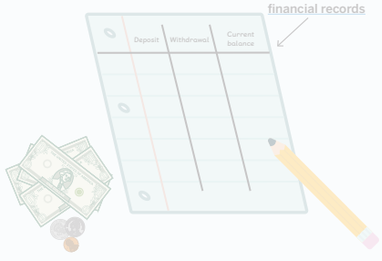
Lesson 16
Practice

Students using digital

Students using print

Summary 3.16

When you deposit or withdraw from your bank account, tracking your transactions with financial records can help you make financial decisions.



financial records A system to help keep track of withdrawals and deposits.

Practice 3.16

1 Han began with an account balance of $150. On Monday, he was paid $50 for teaching a private piano lesson. On Wednesday, Han spent $25.50 at lunch with friends. On Friday, Han spent $30.25 on a movie ticket and popcorn at the theater. Create Han's financial record in the table.

Day	Description	Withdrawal	Deposit	Balance
Mon.	teaching piano		$50.00	$200.00
Wed.	lunch	$25.50		$174.50
Fri.	movie and popcorn	$30.25		$144.25

Grade 5 Unit 3 Lesson 16 288 Summary | Practice

Practice 3.16

Name _____ Date _____

Use the information in Problems 2–5 to complete the financial records.

Day	Item	Withdrawal	Deposit	Account balance
	paycheck		$120.00	$120.00
1	pizza	$5.25		$114.75
2	concert ticket	$50.15		$64.60
3	books	$35.60		$29.00

2 On Day 1, you bought a slice of pizza for $5.25.
Answer shown in the table.

3 On Day 2, you bought a concert ticket for $50.15.
Answer shown in the table.

4 Which items from the list could you purchase on Day 3? Explain your thinking.

computer: $230.25 | movie ticket: $15.30 | books: $35.60 | shoes: $65.15

Sample explanation shown.
I can buy either the movie ticket or the books. I do not have enough money for the other items.

5 Purchase one of the items from Problem 4. Log it in the financial record and record the new account balance.
Sample response shown in the table.

Grade 5 Unit 3 Lesson 16 289 Practice

Practice 3.16

Name _____ Date _____

Spiral Review

For Problems 6 and 7, write the decimal in expanded notation.

6 5.67 (5 × 1) + (6 × 0.1) + (7 × 0.01)

7 0.32 (3 × 0.1) + (2 × 0.01)

For Problems 8 and 9, write the decimal as a fraction.

8 0.8 $\frac{8}{10}$

9 0.12 $\frac{12}{100}$

For Problems 10 and 11, round the number to the nearest 10.

10 244 240

11 99 100

For Problems 12 and 13, round the number to the nearest 100.

12 562 600

13 403 400

14 Miguel made $1,032 before deductions from selling scarves for $12 each. How many scarves did he sell?

Record your answer in the space provided.

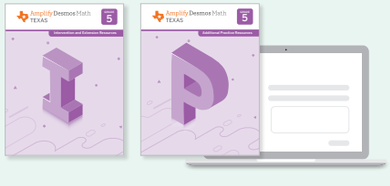
86 scarves

Grade 5 Unit 3 Lesson 16 290 Practice

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-lesson			
Fluency	1	3	5.3.K, 5.10.D
Fluency	2–5	2	5.10.D, 5.10.F
Spiral Review			
	6, 7	1	4.2.B
	8, 9	1	4.2.G
	10–13	1	4.2.D
Test Practice	14	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 16

Lesson Goal: Develop a system for keeping and using financial records.

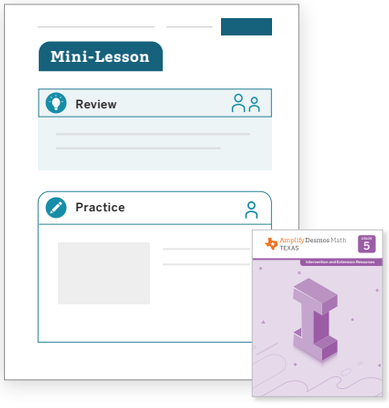
Support

Provide targeted intervention for students by using these resources.

If students develop a system for financial records that includes the amount and new balance:

Respond:

- Assign the *Creating Strategies to Keep Financial Records* Mini-Lesson. | 15 min
- Review the beneficial components of financial records, such as those discussed in the Connect in Activity 1.



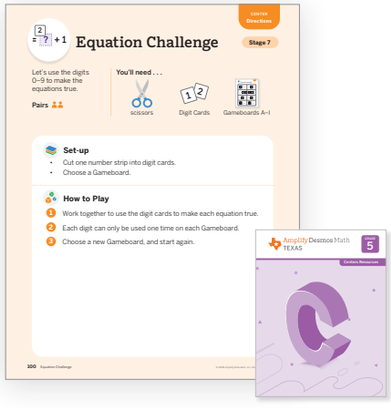
Strengthen

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

If students develop a system for financial records that includes withdrawal or deposit, the amount, and the new balance:

Respond:

- Invite students to play the **Center**. | 15 min
  Equation Challenge: Add and Subtract Beyond 1,000
- Have students complete **Lesson 16 Practice.** | 15 min
- **Item Bank**



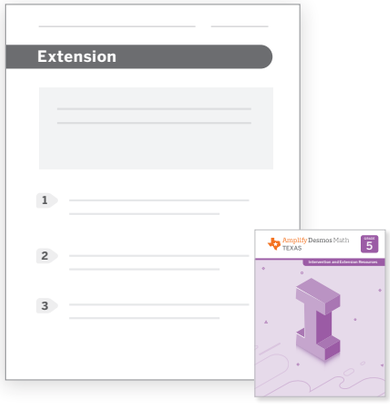
Stretch

Challenge students and extend their learning with these resources.

If students develop a system for financial records that is chronologically organized and includes whether each transaction was a withdrawal or deposit, the amount, and the new balance:

Respond:

- Invite students to explore the **Sub-Unit 4 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



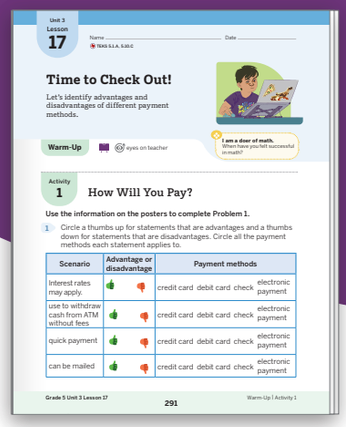


Professional Learning

During the whole class discussions today, whose ideas were heard, valued, and accepted? How could you adjust your practice to ensure every student's ideas are a part of the collective learning process?

Unit 3
Lesson
17

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


Unit 3 Lesson 17

Time to Check Out!

Let's identify advantages and disadvantages of different payment methods.

Warm-Up

Activity 1 How Will You Pay?

Use the information on the posters to complete Problem 1.

1 Circle a thumbs up for statements that are advantages and a thumbs down for statements that are disadvantages. Circle all the payment methods each statement applies to.

Scenario	Advantage or disadvantage	Payment methods
Interest rates may apply.		credit card debit card check electronic payment
use to withdraw cash from ATM without fees		credit card debit card check electronic payment
quick payment		credit card debit card check electronic payment
can be mailed		credit card debit card check electronic payment

Grade 5 Unit 3 Lesson 17 291 Warm-Up | Activity 1

Time to Check Out!

Analyzing Payment Methods

Let's identify advantages and disadvantages of different payment methods.

Key Concepts

Today's Goals

1. **Goal:** Identify the advantages and disadvantages of various payment methods.
2. **Language Goal:** Describe advantages and disadvantages of various payment methods. **(Listening, Speaking, and Writing)** ELPS 1.B, 2.B, 2.E, 4.C, 4.D, 4.F

Connections and Coherence

Students are introduced to the payment methods **check**, **credit card**, **debit card**, and **electronic payment**. They develop an understanding of the advantages and disadvantages of using each method and apply that understanding to real-world scenarios. **(TEKS 5.1.A)**

Prior Learning

In Grade 4, students explored the services provided by financial institutions.

Future Learning

In Grade 6, students will distinguish between credit and debit cards and balance a check register that includes deposits, withdrawals, and transfers.

Integrating Rigor in Student Thinking

- Students develop their **conceptual understanding** of various types of payment methods.

Vocabulary

New Vocabulary

check
credit card
debit card
electronic payment

Review Vocabulary

deposit
interest
withdrawal

TEKS

Addressing

5.10.C

Identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments.

Also Addressing: **5.3.B**

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

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

Building On	Building Toward
4.10.E	**6.14.B**

Building Math Identity

I am a doer of math.

When have you felt successful in math?

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

Lesson at a Glance

60 min

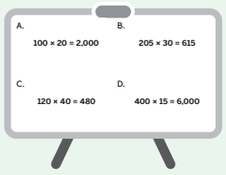
TEKS: 5.1.A, 5.1.F, 5.1.G, 5.3.B, 5.10.C

Warm-Up

Fluency

Whole Class | 10 min

Students use the **True or False?** routine to strengthen their fluency with determining the products of multiplication equations. **(TEKS 5.1.F, 5.1.G)**



Activity 1

Pairs | 15 min

Students explore posters around the room to determine the advantages and disadvantages of different payment methods. The terms **check**, **credit card**, **debit card**, and **electronic payment** are introduced.

Materials: Activity 1 PDF

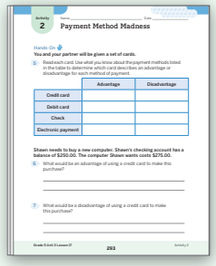


Activity 2

Pairs | 20 min

Students identify the advantages and disadvantages of different payment methods described in various real-world scenarios.

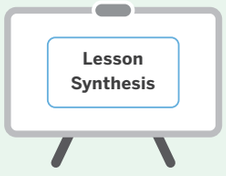
Materials: Activity 2 PDF
Additional Prep: Cut out: Activity 2 PDF



Synthesis

Whole Class | 10 min

Students review and reflect on the importance of considering the advantages and disadvantages of different payment methods before making spending decisions.

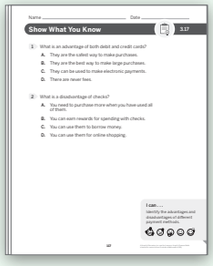


Show What You Know

Independent | 5 min

Students demonstrate their understanding by identifying advantages and disadvantages of different payment methods.

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

ELPS 1.B, 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.

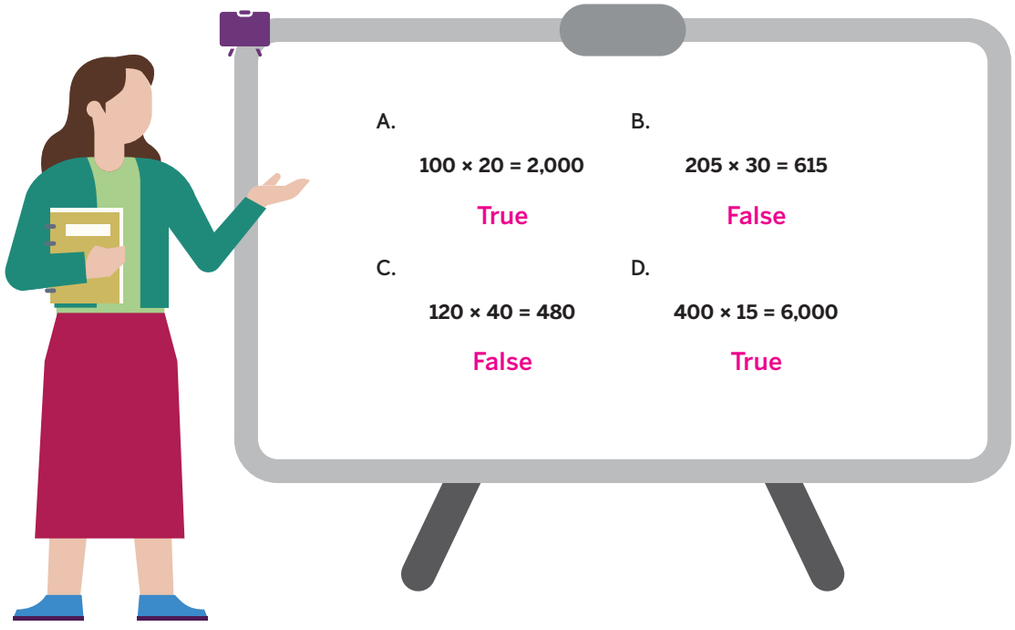
Whole Class | 10 min

Presentation Screen



Warm-Up True or False? Fluency

Purpose: Students strengthen their fluency by determining whether equations are true or false.



Why these problems? These equations lend themselves to building fluency and communicating using mathematical language.

1 Launch

Use the True or False? routine.

Display 1 equation at a time.

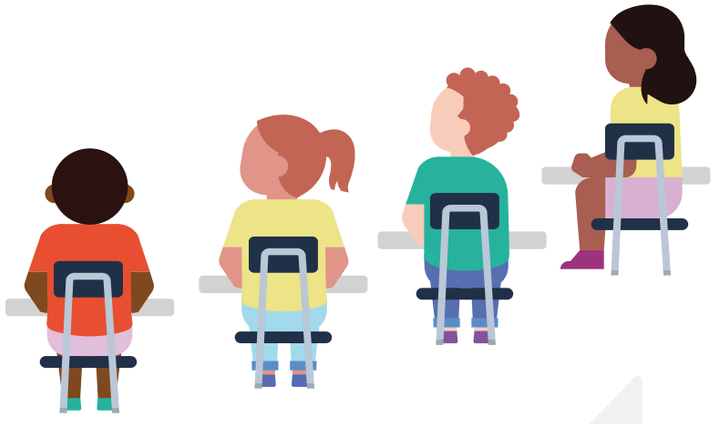
Say, "Give me a signal when you know whether the statement is true or false and can explain how you know."

2 Connect

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

Repeat with each expression.

Ask, "How could you change Expression C to make that statement true?"



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

1: A is true because I know 10 × 2 is 20, so 100 × 20 is 2,000.

2: B is false because 200 × 3, not 30, is 600.

3: C is false because 120 × 4 is 480, so 120 × 40 is 4,800.

4: D is true because I know 2 × 15 is 30, so 4 × 15 is 60, and 60 × 100 is 6,000.

Pairs | 15 min

Activity 1 How Will You Pay?

Purpose: Students analyze different payment methods to determine the advantages and disadvantages of each method.

Presentation Screens



Materials

Lesson Resources:
- Display each page of the Activity 1 PDF around the room during the Launch.

Short on time? Consider omitting Problem 4.

1 Launch



Say, "Gil and Andrea noticed posters on the wall at the bank describing available payment methods. You will use the posters to complete Problem 1 with a partner."

Have students pause to compare their work with another pair before completing Problems 2–4.

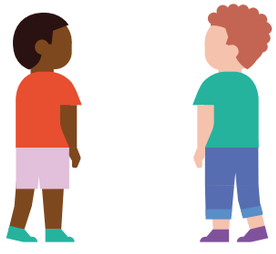
MLR **MLR8: Discussion Supports — Sentence Stems** ELPS 1.E, 2.C, 2.E

Allow students to formulate and rehearse their answers with a partner before writing. Provide the following sentence stems for them as they prepare their responses:

- "An advantage of _____ is _____."
- "A disadvantage of _____ is _____."

EB **Emergent Bilinguals** Invite students to share what they know about advantages and disadvantages to increase access to the task. ELPS 2.B

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, "How could you and your partner work together?"
- Ask, "What do you notice about the posters?"

3 Connect



Use the Think-Pair-Share routine. Invite students to share their responses to Problem 3.

Ask:

- "What did you notice about the advantages of the payment methods? Disadvantages?"
- "Why is it important to consider the advantages and disadvantages before making a spending decision?"

Key Takeaway: Say, "There are advantages and disadvantages of using a **credit card**, a **debit card**, a **check**, or **electronic payment**."

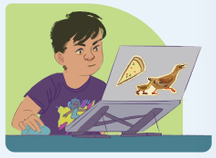
Unit 3
Lesson
17

Name _____ Date _____

TEKS 5.1.A, 5.10.C

Time to Check Out!

Let's identify advantages and disadvantages of different payment methods.



Warm-Up eyes on teacher

I am a doer of math.
When have you felt successful in math?

Activity
1

How Will You Pay?

Use the information on the posters to complete Problem 1.

1 Circle a thumbs up for statements that are advantages and a thumbs down for statements that are disadvantages. Circle all the payment methods each statement applies to.

Scenario	Advantage or disadvantage	Payment methods
Interest rates may apply.	👎	credit card, debit card, check, electronic payment
use to withdraw cash from ATM without fees	👍	credit card, debit card, check, electronic payment
quick payment	👍	credit card, debit card, check, electronic payment
can be mailed	👍	credit card, debit card, check, electronic payment

Activity
1

Name _____ Date _____

How Will You Pay? (continued)

Identify the advantages and disadvantages of the payment methods selected in each scenario and record your answer. Sample responses shown.

2 Gil ordered pizza and paid with an electronic payment on the restaurant's website. Identify 1 advantage of using that payment method.

An advantage of using the electronic payment is that he was able to pay quickly.

3 Rent is due in a few days, so Andrea's mom mails a check. Identify 1 disadvantage of paying with a check.

The check may take a long time and be considered late.

4 Clare wants to buy a new car but only has a debit card. What is a disadvantage of having a debit card in this scenario?

A disadvantage of having a debit card is that she would need to have all of the money for the car in her bank account to be able to pay for it.

D Differentiation | Teacher Moves

Presentation Screens

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify an advantage of checks.	**Checks can be canceled if you lose them.**	**Support** Ask, "What are the disadvantages of using checks?"
Identify a disadvantage of checks.	**The check may take a long time and be considered late.**	**Stretch** Ask, "In what kind of situation would it be better to use an electronic payment instead of a check to pay rent?"

Pairs | 20 min

Activity 2 Payment Method Madness

Purpose: Students apply their understanding of the advantages and disadvantages of different payment methods to real-world scenarios.

Presentation Screens



Materials

Lesson Resources:

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

1 Launch

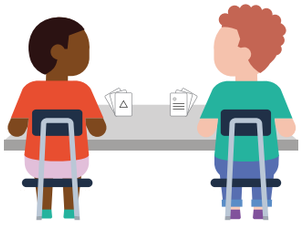


Say, "Work with your partner to complete Problem 5."

Have students pause to compare their work with another pair before completing Problems 6–9 independently.

A **Accessibility: Memory and attention** Frequently check-in with students as they complete Problem 5.

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 need to do first?"
- Ask, "How could you work with your partner to make a plan for this work?"

3 Connect



Use the Think-Pair-Share routine. Invite students to share how they determined their answer to Problem 5.

Ask:

- "What did you notice about identifying the advantages and disadvantages of payment methods in the different scenarios?"
- "How did you decide whether a situation presented an advantage or disadvantage? Were there situations that might be labeled more than 1 way?"

Key Takeaway: Say, "Understanding the advantages and disadvantages of payment methods can be useful to determine how you will make purchases in a given situation. Some situations could present both advantages and disadvantages for a payment method."

Student Edition

Activity 2

Name _____ Date _____

Payment Method Madness

Hands-On

You and your partner will be given a set of cards.

5 Read each card. Use what you know about the payment methods listed in the table to determine which card describes an advantage or disadvantage for each method of payment.

	Advantage	Disadvantage
Credit card	G	B
Debit card	A, F	C
Check	I	E
Electronic payment	D, H	D

Shawn needs to buy a new computer. Shawn's checking account has a balance of $250.00. The computer Shawn wants costs $275.00.

6 What would be an advantage of using a credit card to make this purchase? Sample response shown.

The credit card allows Shawn to buy something he does not have all of the money for right now.

7 What would be a disadvantage of using a credit card to make this purchase? Sample response shown.

Shawn may have to pay interest on the computer purchase if he does not pay the bill on time.

Activity 2

Name _____ Date _____

Payment Method Madness (continued)

8 Priya is purchasing a new dishwasher for $1,000. Which of the following is an advantage of using a credit card in this situation?

- (A) Priya may pay interest on the cost of the dishwasher.
- (B) Priya is able to borrow money she does not currently have.
- (C) Priya is only able to spend up to the amount in her checking account.
- (D) Priya is able to mail her payment.

9 Han used a debit card to buy a present for his dad. Which of the following is a disadvantage of using a debit card in this situation?

- (A) Han may pay interest on the cost of the present.
- (B) Han is able to borrow money he does not currently have.
- (C) Han is only able to spend up to the amount in his checking account.
- (D) Han is able to mail his payment.

Presentation Screens

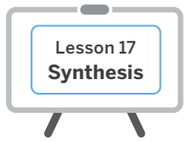
D Differentiation | Teacher Moves

Look for students who . . .	For example . . .	Provide support . . .
Almost there Identify advantages as disadvantages or vice versa.	Electronic payment: Advantage D; Disadvantage D, H	**Support** Ask, "What does it mean for something to be an advantage? A disadvantage?"
Identify an advantage or disadvantage of the payment method for each scenario.	Electronic payment: Advantage H; Disadvantage D	**Strengthen** Ask, "Which scenarios, if any, might describe both an advantage and a disadvantage?"
Identify both advantages and disadvantages present in each scenario where possible.	Electronic payment: Advantage D, H; Disadvantage D	**Stretch** Ask, "Which decisions, if any, would you have made differently in these situations?"

Whole Class | 10 min

Synthesis

Presentation Screens



Lesson Takeaway: A **credit card**, a **debit card**, a **check**, and an **electronic payment** each present advantages and disadvantages, which are helpful to consider when making financial decisions.



Say, "Today, you determined the advantages and disadvantages of different payment methods."

Display the Synthesis screen.

Use the Think-Pair-Share routine. Ask:

- "What would be an advantage of using a credit card to purchase the tires? A disadvantage?"
- "What advantages or disadvantages could you identify if you were to use a check for one of the purchases? An electronic payment? A debit card?"

Say, "It is important to consider the advantages and disadvantages of payment methods before spending."

Formalize vocabulary: check, **credit card**, **debit card**, **electronic payment**

(optional)

Consider using the Word Connections: Making Predictions routine with one or more of the new vocabulary words. Consider asking, "What does *credit* mean? What does *debit* mean? How could you use these meanings to predict what a *credit card* and a *debit card* are used for?" **ELPS 3.E**

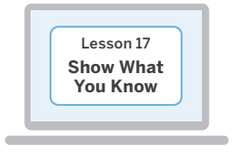
Refer to the *Math Language Development Resources* for a description of this routine and for more vocabulary support.

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

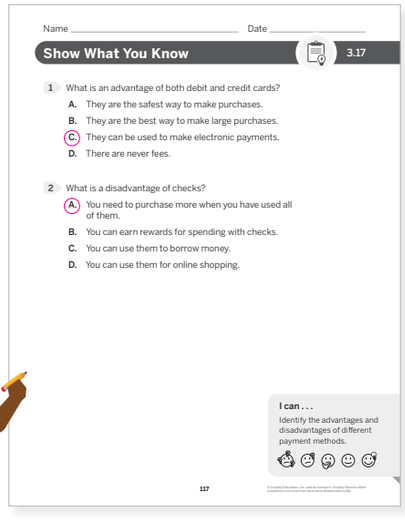
Show What You Know

Independent | 5 min

Students using digital



Show What You Know PDF


Name _____ Date _____

Show What You Know 3.17

1 What is an advantage of both debit and credit cards?
- A. They are the safest way to make purchases.
- B. They are the best way to make large purchases.
- C. They can be used to make electronic payments.
- D. There are never fees.

2 What is a disadvantage of checks?
- A. You need to purchase more when you have used all of them.
- B. You can earn rewards for spending with checks.
- C. You can use them to borrow money.
- D. You can use them for online shopping.

I can . . .
Identify the advantages and disadvantages of different payment methods.

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Today's Goals

1. **Goal:** Identify the advantages and disadvantages of various payment methods.
   - In Problems 1 and 2 in the *Show What You Know*, students identified an advantage and disadvantage of different payment methods.
2. **Language Goal:** Describe advantages and disadvantages of various payment methods. **(Listening, Speaking, and Writing)** **ELPS 1.B, 2.B, 2.E, 4.C, 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 17
Practice

Students using digital

Students using print

Summary 3.17

When spending, you should consider the advantages and disadvantages of payment methods, such as a **credit card**, a **debit card**, a **check**, or an **electronic payment**, in order to make responsible financial decisions.

debit card



Pressmaster/Shutterstock.com

debit card A card issued by a bank to make purchases using the funds in a checking account.

Practice 3.17

1 Complete the statement so that it correctly identifies the scenario as being either an advantage or disadvantage of the appropriate payment method.

Select **ONE** correct answer in each box to complete the sentence.

One [(A) advantage (B) disadvantage] of using a [(A) credit card (B) debit card] is the possibility of needing to pay interest.

Practice 3.17

Name _____ Date _____

2 Clare uses her PIN when she pays with a debit card. Is this an advantage or disadvantage? Explain your thinking. Sample explanation shown.

Using a PIN is an advantage because it makes paying with a debit card safer.

3 Which of the following is a disadvantage of checks?

(A) They can be canceled if you lose a check.
(B) You need to purchase checks from the bank.
(C) Banks offer rewards for spending with checks.
(D) There are often convenience fees for spending with a check.

4 Which of the following is a disadvantage of credit cards?

(A) Credit cards allow you to borrow money.
(B) There are never fees for spending with a credit card.
(C) Credit cards often lead to overspending.
(D) Banks offer rewards for spending with them.

5 Which of the following is a disadvantage of debit cards?

(A) Debit cards allow you to borrow money.
(B) Debit cards only allow you to spend the amount of money you have in your checking account.
(C) Debit cards often lead to overspending.
(D) Banks offer rewards for spending with them.

Practice 3.17

Name _____ Date _____

For Problems 6–11, determine the product. Sample work shown.

Show your thinking.

6 260 × 12

$$\begin{array}{r} {\scriptstyle 1}\\ 260\\ \times\ 12\\ \hline 520\\ +\ 2{,}600\\ \hline 3{,}120 \end{array}$$

answer: 3,120

7 125 × 40

$$\begin{array}{r} {\scriptstyle 12}\\ 125\\ \times\ 40\\ \hline 000\\ +\ 5{,}000\\ \hline 5{,}000 \end{array}$$

answer: 5,000

Spiral Review

Show your thinking.

8 33 × 15

$$\begin{array}{r} {\scriptstyle 1}\\ 33\\ \times\ 15\\ \hline 165\\ +\ 330\\ \hline 495 \end{array}$$

answer: 495

9 72 × 35

$$\begin{array}{r} {\scriptstyle 1}\\ 72\\ \times\ 35\\ \hline 1\,360\\ +\ 2{,}160\\ \hline 2{,}520 \end{array}$$

answer: 2,520

10 24 × 25

$$\begin{array}{r} {\scriptstyle 2}\\ 24\\ \times\ 25\\ \hline 120\\ +\ 480\\ \hline 600 \end{array}$$

answer: 600

11 60 × 17

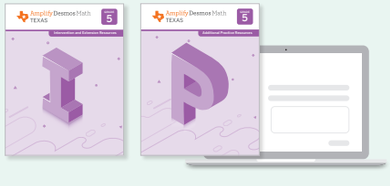
$$\begin{array}{r} {\scriptstyle 60}\\ \times\ 17\\ \hline 420\\ +\ 600\\ \hline 1020 \end{array}$$

answer: 1,020

Practice Problem Item Analysis

	Problem(s)	DOK	TEKS
On-lesson			
Test Practice	1	1	5.10.C
	2–5	1	5.10.C
Fluency	6, 7	1	5.3.B
Spiral Review			
Fluency	8–11	1	4.4.D

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: Identify the advantages and disadvantages of various payment methods.

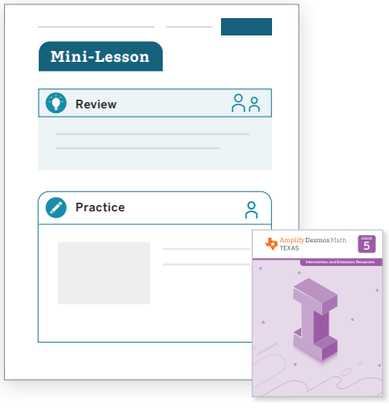
Support

Provide targeted intervention for students by using these resources.

If students identify advantages as disadvantages or vice versa:

Respond:

- Assign the *Analyzing Payment Methods* Mini-Lesson. | 15 min
- Review the definitions of *advantages* and *disadvantages*.



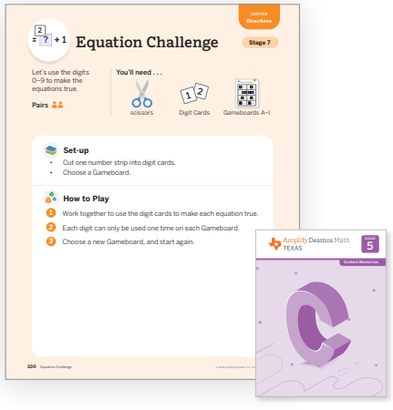
Strengthen

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

If students identify an advantage or disadvantage of each payment method:

Respond:

- Invite students to play the **Center.** | 15 min
  Equation Challenge: Multi-Digit Factors
- Have students complete **Lesson 17 Practice.** | 15 min
- **Item Bank**



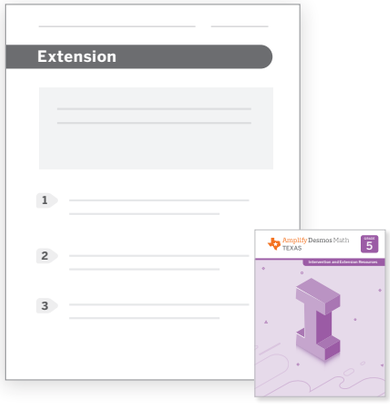
Stretch

Challenge students and extend their learning with these resources.

If students identify both advantages and disadvantages of using diffrenting payment methods in different scenarios:

Respond:

- Invite students to explore the **Sub-Unit 4 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., **check**/**cheque**
- Frayer Model templates
- Vocabulary routines





Professional Learning

What personal connections did students make with considering the advantages and disadvantages of payment methods? How can you encourage students to connect the topics discussed in this sub-unit to real world situations?

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
Estimate to determine the product in multiplication problems.		
Multiply a three-digit number by a two-digit number using the standard algorithm.		
Estimate to determine the quotient of up to a four-digit dividend and a two-digit divisor.		
Divide a four-digit dividend by a two-digit divisor using partial quotients.		
Divide a four-digit dividend by a two-digit divisor using the standard algorithm.		
Represent multi-step problems using equations with a letter standing for the unknown.		
Solve multi-step problems using equations with a letter standing for the unknown.		
Simplify expressions that include up to 2 levels of grouping.		
Define income tax, payroll tax, sales tax, and property tax.		
Explain the difference between gross income and net income.		
Identify the advantages and disadvantages of different payment methods.		

Grade 5 Unit 3 184 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	Concept or skill	Addressed in	DOK	TEKS
1	Multiplying multi-digit whole numbers fluently using the standard algorithm	Lesson 5	1	5.3.B *(S)*
2	Determining whole number quotients of up to four-digit dividends and two-digit divisors	Lesson 9	1	5.3.C *(S)*
3	Estimating to solve whole number quotients of up to four-digit dividends and two-digit divisors	Lesson 13	1	5.3.A *(S)* 5.1.C
4	Writing equations using parentheses to represent multi-step story problems	Lesson 11	2	5.3.B *(S)*
5	Determining quotients in area contexts	Lesson 9	2	5.3.C *(S)*, 5.4.H *(R)*
6	Identifying types of taxes	Lesson 14	1	5.10.A *(S)*
7	Balancing a budget by adding and subtracting decimals	Lesson 15	2	5.10.F *(S)* 5.1.A
Extended Response				
8	Explaining the difference between gross income and net income	Lesson 14	1	5.10.B *(S)*
9	Balancing a budget by adding and subtracting decimals	Lesson 15	2	5.10.E *(S)*, 5.10.F *(S)* 5.1.A
10	Identifying the advantages and disadvantages of different methods of payment	Lesson 17	1	5.10.C 5.1.G

Assessment Resources



- Student Print Assessments (Forms A and B)
- Answer Keys and Rubrics

Differentiation Resources





Intervention and Extension Resources includes:
- Mini-Lessons
- Extensions

Centers Resources includes:
- Centers

Practice

If students need further review or practice with concepts or skills from Unit 3, consider the following resources:

- Lesson Practice (Print and Digital)
- Item Bank (Digital)

Name _____ Date _____

End-of-Unit Assessment

Unit 5.3

1 Determine the product 375 × 47 using the standard algorithm.

Show your thinking.

Sample work shown.

```
  32
  53
 375
×  47
2,625
+15,000
17,625
```

answer: 17,625

2 Determine the quotient 1,530 ÷ 34.

Show your thinking.

Sample work shown.

```
34)1530
- 680   20
  850
- 680   20   45
  170
- 170    5
    0
```

answer: 45

3 Select the number that is closest to the quotient 8,745 ÷ 3.

A. 30
B. 300
C. 3,000
D. 30,000

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Name _____ Date _____

End-of-Unit Assessment (continued)

4 A school ordered 18 boxes of textbooks. There were 26 textbooks in each box. 36 textbooks were distributed to each classroom. Which equation can be used to solve for c, the number of classrooms that received textbooks?

A. $c = (18 + 26) \div 36$
B. $c = 36 \div (18 \times 26)$
C. $c = (18 \times 26) - 36$
D. $c = (18 \times 26) \div 36$

5 The area of a rectangular yard is 5,664 square feet and its length is 48 feet. What is its width in feet? Sample work shown.

Show your thinking.

```
      8
     10   100 + 10 + 8 = 118
    100
48)5664
- 4800
   864
-  480
   384
-  384
      0
```

answer: 118 feet

6 Complete the sentence by selecting **ONE** correct answer to make the statement about taxes true.

A. Income tax
B. Payroll tax
C. Property tax
D. Sales tax

is money that people pay to the local government based on the value of their home or land.

Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.3

7 Clare's net income for the month of October is $3,542.88. The table below shows an incomplete budget.

Expense	Amount
rent	$850.71
food	$1,061.43
entertainment	$789.25
medical	$125.67
savings	

How much should Clare put in savings for the month of October to keep a balanced budget?

$715.82

8 What is the difference between net income and gross income?
Sample response shown.

Gross income is the full amount you receive before taxes, and net income is what you get to keep after paying taxes and other costs.

Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.3

For Problems 9 and 10, 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?

Diego started a new job and is deciding how to balance his budget. His net income for the month of December is $2,465.76.

9 What changes should he make to balance his budget?
Sample response shown.

Diego's expenses are $200 more than his net income. He can reduce gifts and savings by $100 each to balance his budget.

Expense	Amount
rent	$975.63
utilities	$612.79
food	$587.63
gifts	$239.71
savings	$250.00

10 Diego has $200 in savings. He is planning to use a credit card to purchase a bike for $100. His friend Han says that he should use a debit card instead of a credit card. Why might Han think he should use a debit card instead? Sample response shown.

Han might think Diego should use a debit card instead of a credit card so he will not pay interest on the bike purchase. Diego has enough money in his savings to be able to purchase the bike using a debit card.

Name _____ Date _____

End-of-Unit Assessment

Unit 5.3

1 Determine the product 485 × 36 using the standard algorithm.

Show your thinking.

Sample work shown.

```
   485
×   36
 2,910
+14,550
 17,460
```

answer: 17,460

2 Determine the quotient 1,375 ÷ 25.

Show your thinking.

Sample work shown.

```
      55
25)1375
 - 1250   50
    125
 -  125    5
      0
```

55

answer: 55

3 Select the number that is closest to the quotient 6,145 ÷ 3.

A. 20
B. 200
C. 2,000
D. 20,000

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Name _____ Date _____

End-of-Unit Assessment (continued)

4 A school ordered 19 boxes of pencils. There were 37 pencils in each box. 24 pencils were distributed to each classroom. Which equation can be used to solve for *c*, the number of classrooms that received pencils?

A. $c = (19 \times 37) \div 24$
B. $c = (19 \times 37) - 24$
C. $c = 24 \div (19 \times 37)$
D. $c = (19 + 37) \div 24$

5 The area of a rectangular yard is 4,032 square feet and its length is 36 feet. What is its width in feet? Sample work shown.

Show your thinking.

```
      2
     10   100 + 10 + 2 = 112
    100
36)4032
 - 3600
    432
 -  360
     72
 -   72
      0
```

answer: 112 feet

6 Complete the sentence by selecting **ONE** correct answer to make the statement about taxes true.

A. Income tax
B. Payroll tax
C. Property tax
D. Sales tax

is a tax on goods and services.

Name _____ Date _____

End-of-Unit Assessment (continued)

Unit 5.3

For Problems 9 and 10, 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?

Jada started a new job and is deciding how to balance her budget. Her net income for the month of December is $2,474.89.

9 What changes should she make to balance her budget?

Sample response shown.

Jada's expenses are $400 more than her net income. She can reduce shopping and savings by $200 each to balance her budget.

Expense	Amount
rent	$884.54
utilities	$721.86
food	$479.74
shopping	$338.75
savings	$450.00

10 Jada has $300 in savings. She is planning to use a credit card to purchase a video game for $150. Her friend Han says that she should use a debit card instead of a credit card. Why might Han think she should use a debit card instead? Sample response shown.

Han might think Jada should use a debit card instead of a credit card so she will not pay interest on the video game purchase. Jada has enough money in her savings to be able to purchase the game using a debit card.

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: Multiply multi-digit whole numbers using the standard algorithm.	1	**Support** • **Mini-Lesson:** *Multi-Digit Multiplication Fluency* (ML 3.05) • **Center:** *Equation Challenge, Multi-Digit Factors* • **Teacher Move:** Consider inviting students to review the problem and then provide additional opportunities for students to solve problems using the standard algorithm.
Sub-Unit 2: Divide multi-digit whole numbers using strategies based on place value and the relationship between multiplication and division.	2	**Support** • **Mini-Lesson:** *Dividing Four-Digit Dividends by Two-Digit Divisors Without Remainders* (ML 3.09) • **Center:** *Watch Your Remainder, Two-digit Divisors* • *Teacher Move:* Consider inviting students to review the problem and then provide additional opportunities for students to solve problems using the standard algorithm.
	3	**Support** • **Mini-Lesson:** *Using Partial Quotients To Divide By Place* (ML 3.08) • **Center:** *Watch Your Remainder, One-digit Divisors* • **Teacher Move:** Have students review the problem by justifying their response to a partner.
	5	**Support** • **Mini-Lesson:** *Using Partial Quotients To Divide By Place* (ML 3.08) • **Center:** *Watch Your Remainder, One-digit Divisors* • **Teacher Move:** Have students review the problem and then provide additional opportunities for students to determine the width of a rectangle given its area and length.
Sub-Unit 3: • Represent multi-step story problems by identifying and writing equations with a letter standing for the unknown quantity. • Interpret and compare written and numerical equations without evaluating them.	4	**Support** • **Mini-Lesson:** *Selecting Equations With Parentheses to Represent Multi-Step Story Problems* (ML 3.11) • EB **Emergent Bilinguals:** Invite students to use colored pencils to color-code each value with where they see it represented in the text to help them make connections to the equations. **ELPS 3.E, 3.F**
Sub-Unit 4: • Calculate gross income and net income. • Identify income tax, payroll tax, sales tax and property tax. • Balance a budget by adding and subtracting decimals. • Create and use a financial record.	6, 8	**Support** • **Mini-Lesson:** *Identifying Types of Income and Taxes* (ML 3.14) • **Teacher Move:** Consider inviting students to review the problem and then provide additional opportunities for students to identify the type of tax and ask them to justify their response.
	7, 9	**Support** • **Mini-Lesson:** *Balancing a Budget* (ML 3.15) • **Teacher Move:** Consider revisiting Lesson 15.
	10	**Support** • **Mini-Lesson:** *Analyzing Payment Methods* (ML 3.17) • **Teacher Move:** Consider revisiting Lesson 17. • EB **Emergent Bilinguals:** Invite students to review the problem with a partner. Ask them to write a revised draft of their explanations using their primary language and then write a second draft in English. Consider pairing students who speak the same primary language. **ELPS 4.C, 4.D, 4.E, 4.F**