Math Expressions and CCSS Assessment

Steps to Success for the PARCC and Smarter Balanced Problems


TO DO!

Ms. Morales has a bag of beads.

- She gives Elena 5 beads.
- She gives Damian 8 more beads than Elena.
- She gives Trish 4 times as many beads as Damian.

Ms. Morales then has 10 beads left in the bag.

Part A

How many beads did Damian and Trish each receive? Show or explain how you arrived at each answer.

Cut Paste Undo Redo

Part B

How many beads were in Ms. Morales' bag before any beads were given to students?

_____ beads

PARCC Partnership for Assessment of Readiness for College and Careers

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- Mrs. Morales has a bag of beads.

  She gives Elena 5 beads.
  She gives Damian 8 more beads than Elena.
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PART A

How many beads did Damian and Trish each receive? Show or Explain how you arrived at your answer

Part B

How many beads were in Mrs. Morales' bag before any beads were given to students?

4.OA.A: Use the four operations with whole numbers to solve problems.

1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

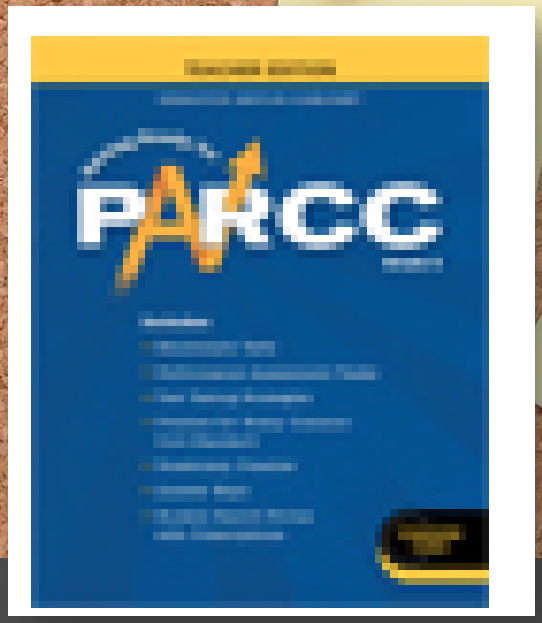
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Most Relevant Standards for Mathematical Practice	Students must reason abstractly and quantitatively with the context in order to understand the relationships given in the question (MP.2). Creating this multi-step solution path will require students to create an effective model of the situation (MP.4), but the question allows for students to create whatever models they are most comfortable employing (e.g., some students may create a series of expressions, other student may choose to diagram the situation).

STRATEGIES

MODELS



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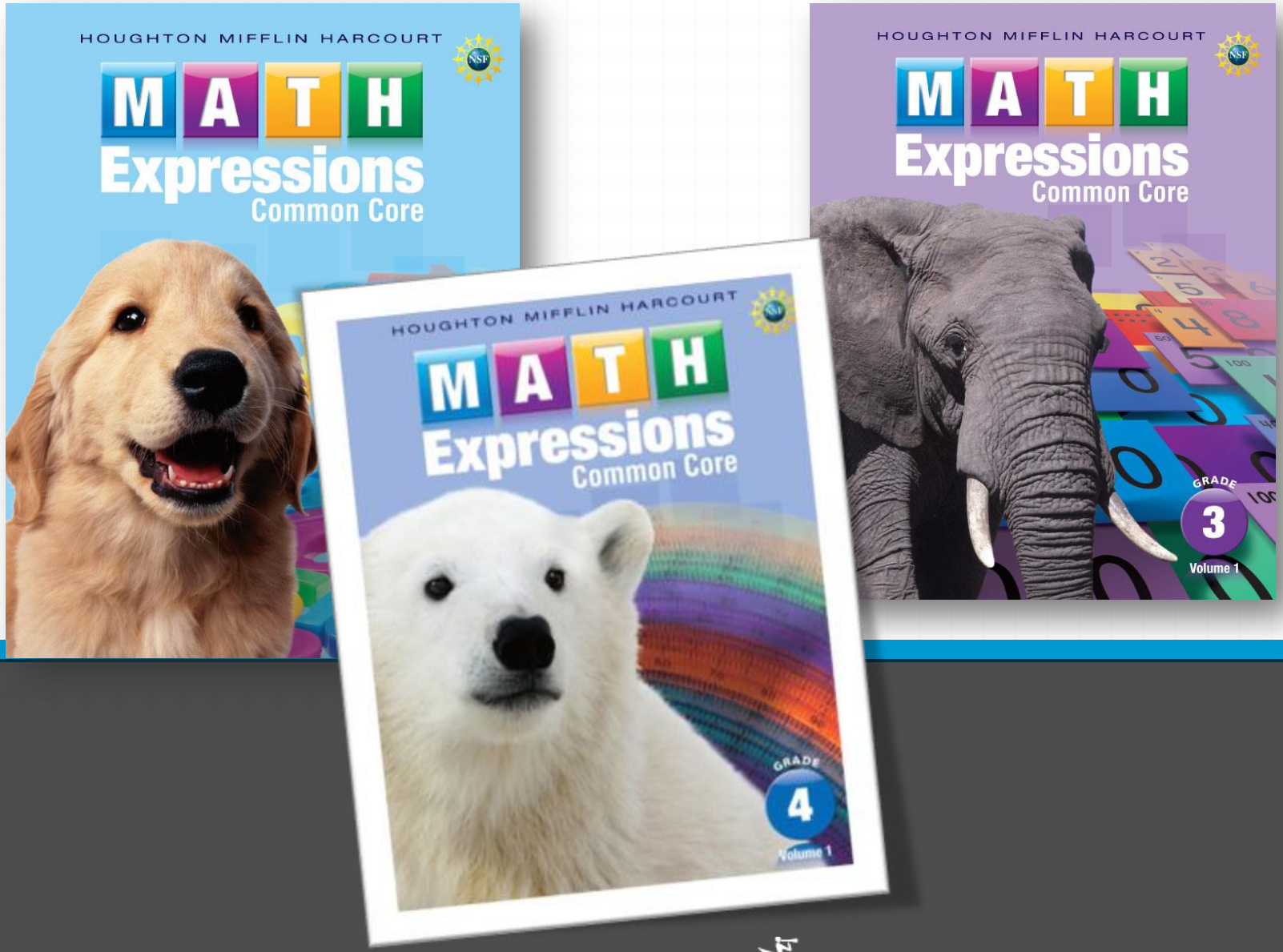
"Trust yourself.
You know more than
you think you do."
— Benjamin Spock



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CC.4.OA Operations and Algebraic Thinking

Use the four operations with whole numbers to solve proble		Unit 4 Lessons 4, 5, 6, 12
CC.4.OA.1	Interpret a multiplication equation as a comparison, e.g., inter 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 an times as many as 5. Represent verbal statements of multiplicat comparisons as multiplication equations.	Unit 4 Lessons 4, 5, 6, 12
CC.4.OA.2	Multiply or divide to solve word problems involving multiplicat comparison, e.g., by using drawings and equations with a sym for the unknown number to represent the problem, distinguish multiplicative comparison from additive comparison.	Unit 1 Lessons 8, 11 Unit 2 Lessons 11, 15, 18, 19 Unit 3 Lessons 8, 9, 10 Unit 4 Lessons 7, 8, 9, 12
CC.4.OA.3	Solve multistep word problems posed with whole numbers an whole-number answers using the four operations, including pr which remainders must be interpreted. Represent these proble equations with a letter standing for the unknown quantity. Ass reasonableness of answers using mental computation and esti strategies including rounding.	
Gain familiarity with factors and multiples.		
CC.4.OA.4	Find all factor pairs for a whole number in the range 1–100. R that a whole number is a multiple of each of its factors. Deter whether a given whole number in the range 1–100 is a multip given one-digit number. Determine whether a given whole nu the range 1–100 is prime or composite.	Unit 4 Lessons 10, 12

		Lesson 3
Understand properties of multiplication and the relationship between multiplication and division.		
CC.3.OA.5	Apply properties of operations as strategies to multiply and divide.	Unit 1 Lessons 3, 6, 11, 12, 14, 15, 19; Unit 2 Lessons 1, 8, 12, 15
CC.3.OA.6	Understand division as an unknown-factor problem.	Unit 1 Lessons 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18; Unit 2 Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Multiply and divide within 100.		
CC.3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Unit 1 Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19; Unit 2 Lessons 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Solve problems involving the four operations, and identify and explain patterns in arithmetic.		
CC.3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Unit 2 Lessons 9, 10, 11, 13; Unit 4 Lesson 17; Unit 5 Lessons 7, 8, 9, 10, 11
CC.3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.	Unit 1 Lessons 1, 5, 6, 7, 8, 10, 12, 15, 19; Unit 2 Lessons 1, 3, 5, 6, 8, 14, 15; Unit 4 Lesson 17

UNIT 2
LESSON
11

Multistep Word Problems

LESSON FOCUS
- Solve real world problems.

COMMON CORE
Mathematical Practice
CC.K–12.MP.1, CC.K–12.MP.2

The Day at a Glance

Teaching the Lesson

MATH BACKGROUND for this lesson is included on p. 11

ACTIVITY FOCUS

Activity 1 Identify extra information in word problems.
Activity 2 Identify missing information in word problems.
Activity 3 Explore hidden information in multistep word problems.

MATERIALS

Student Activity Book pp. 65–68 or Student Har

QUICK PRACTICE 5 MINUTES

Goal Fluency with zeros patterns.

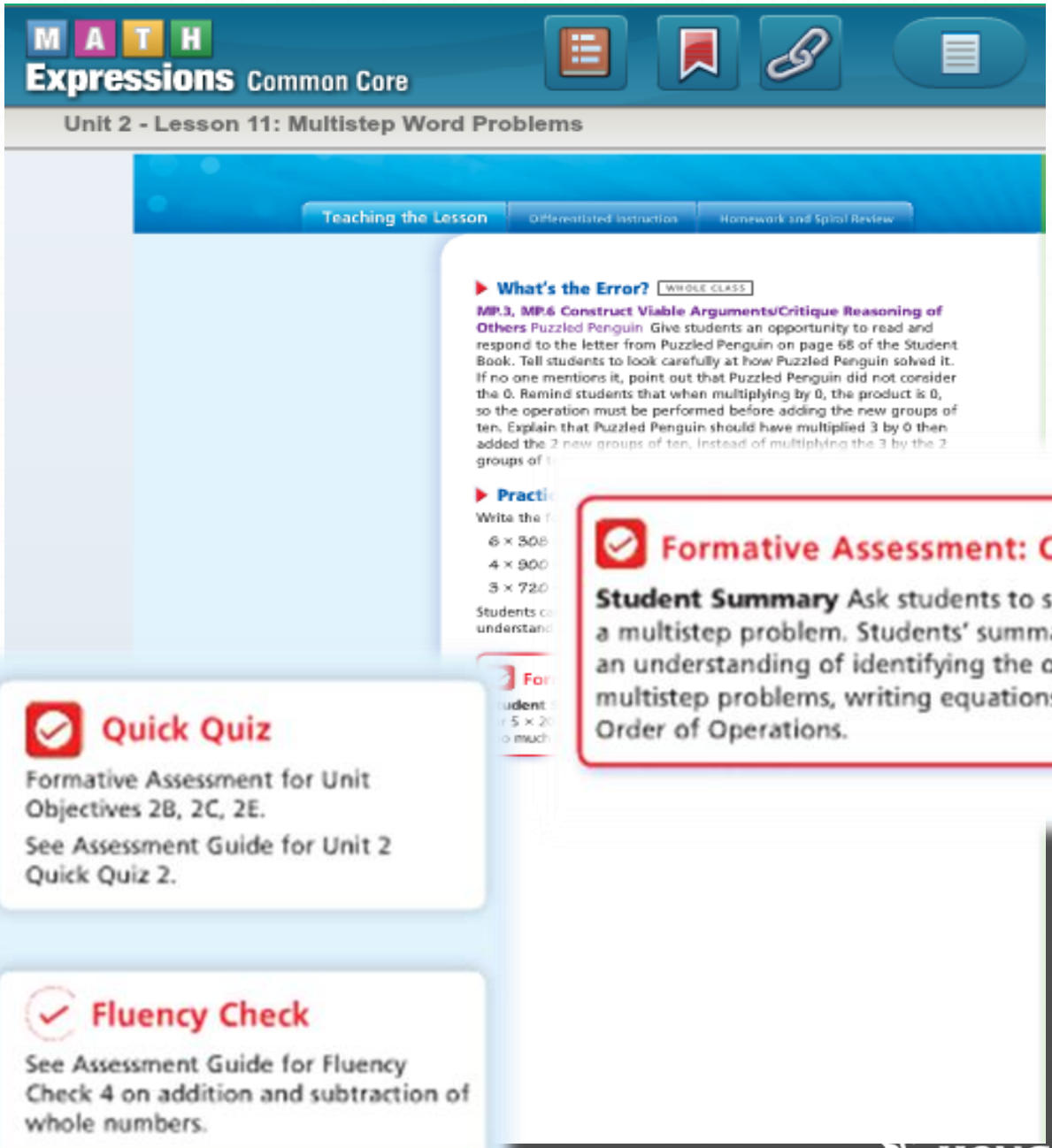
Zeros Patterns Select four **Student Leaders** to go to the board to each write three products involving two non-zero digits and up to two zeros. That is, a product can have no zeros in the factors, a zero in one factor, a zero in both factors, or two zeros in one factor (see the example below). See Lesson 5.

	Student Leader Writes
ndred	= 630
ix red."	= 6,300
ix red."	= 6,300

ANYTIME PROBLEM

Suppose 20 students play soccer and 15 students play baseball. Four students play both soccer and baseball. How many students play one sport or both sports?

31 students: 16 play only soccer (20 − 4 = 16), 11 play only baseball (15 − 4 = 11), and 4 play both soccer and baseball, 16 + 11 + 4 = 31



► What's the Error?

Dear Math Students,

My friend and I are planning a hike. We will hike from point *A* to point *B*. which is a distance of 28 miles. Then we will hike from Point *B* to Point *C*. which is a distance of 34 miles. We will walk 7 miles each day for 8 days. We are trying to figure out how many miles we need to walk on the ninth day to reach Point *C*.

I wrote and solved this equation.

$28 + 34 - 7 \times 8 = t$

$62 - 7 \times 8 = t$

$55 \times 8 = t$

$440 = t$

This answer doesn't make sense. Did I do something wrong? What do you think?

Your friend,
Puzzled Penguin

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8. Write a response to Puzzled Penguin.

_____

_____

_____

Quick Quiz

Formative Assessment for Unit Objectives 2B, 2C, 2E.

See Assessment Guide for Unit 2 Quick Quiz 2.

Fluency Check

See Assessment Guide for Fluency Check 4 on addition and subtraction of whole numbers.

Formative Assessment: Check Understanding

Student Summary Ask students to summarize how to solve a multistep problem. Students' summaries should demonstrate an understanding of identifying the operations needed for the multistep problems, writing equations, and solving by using the Order of Operations.

Math Writing Prompt

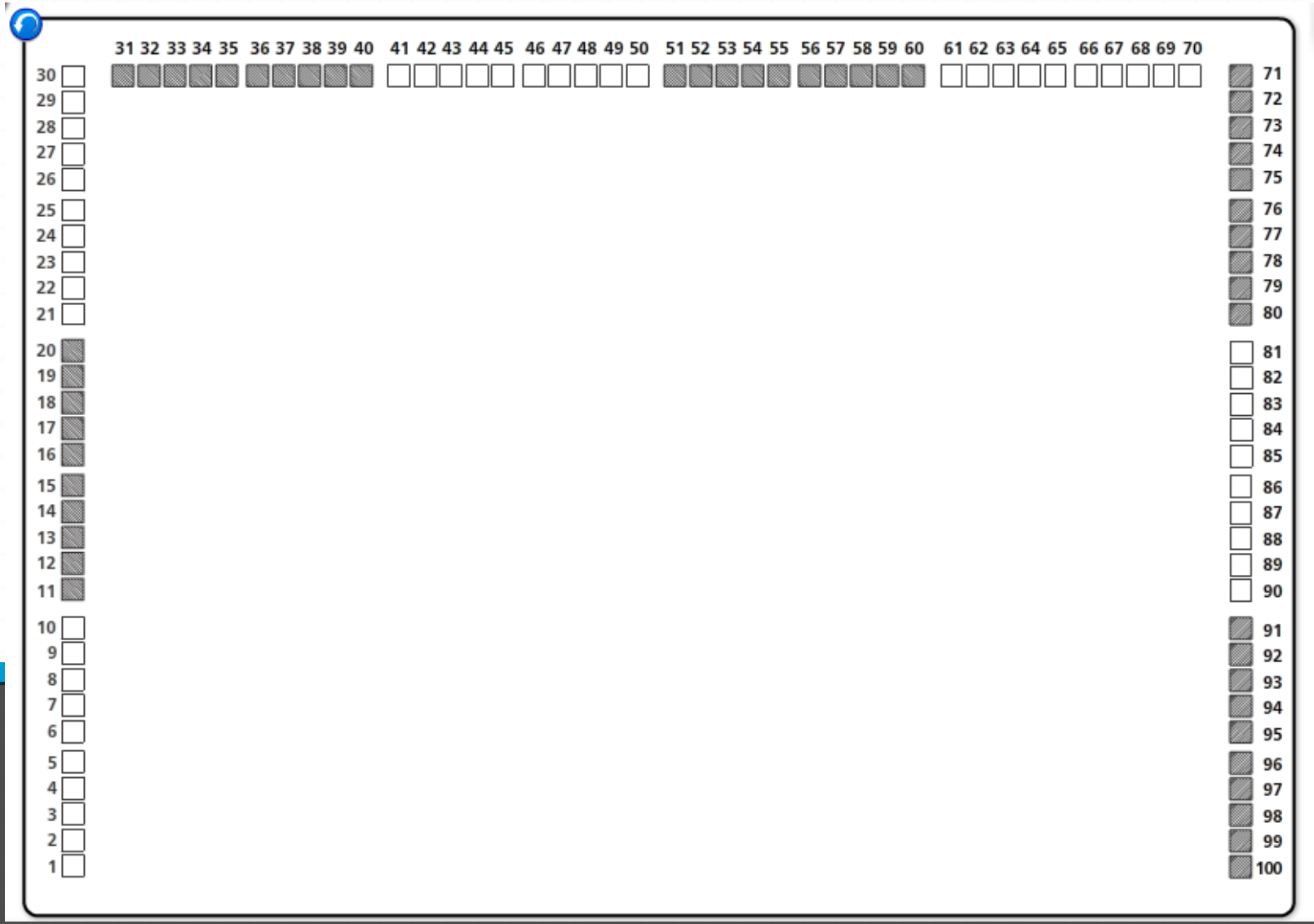
Compare Is it easier to recognize that you do not have enough information to solve a word problem or to eliminate extra information? Explain.

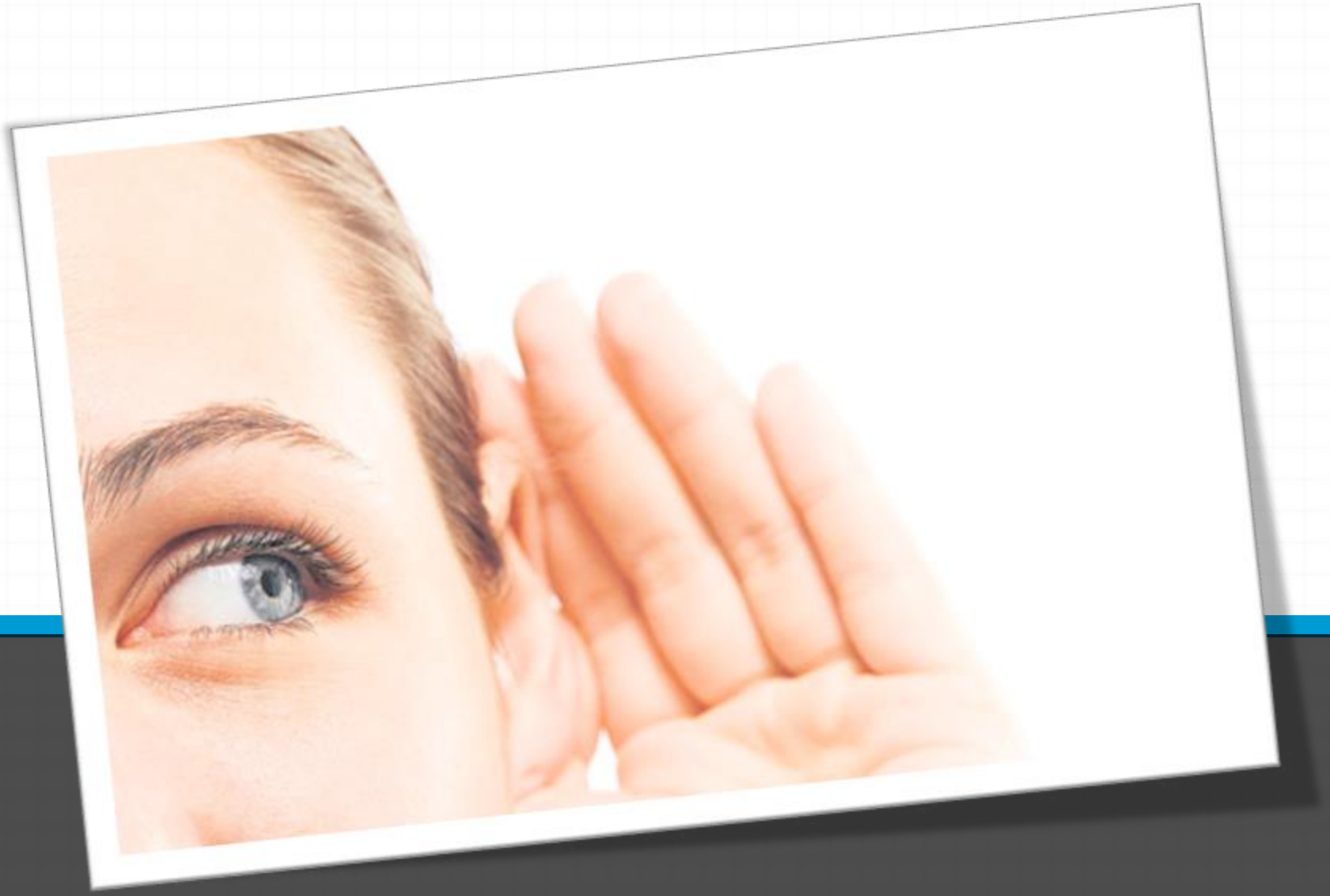
Math Writing Prompt

Explain How do you determine if a word problem has all the necessary information?

Math Writing Prompt

Investigate Math Write an equation that involves four different operations. Then write a word problem for it.





6. Dori wrote this problem: Mrs. Ramos has 1,352 stamps. She buys some more stamps. Now she has 1,943 stamps. How many stamps did she buy? Explain why the situation equation $1{,}352 + s = 1{,}943$ represents Dori's problem. (Lesson 4-2)

Student Activity Book page 147

Multistep Word Problems

PAIRS

MATH TALK

MP.4 Model with Mathematics Write an Equation The word problems on Students Book page 147 are all more than two steps and involve any of the four operations. Remind students to write one or more equations for each word problem to represent and solve it. After students solve each problem, encourage them to reread the problem and evaluate the answer for reasonableness.

MP.1 Make Sense of Problems Problem 4 involves interpreting the remainder of the problem to solve. Students should be familiar with making sense of remainders from Unit 3. Review with students the different ways to interpret the remainder:

- Only the quotient is the answer; ignore the remainder.
- A remainder causes the answer to be rounded up.
- Only the remainder is the answer.

► Problem Solving

Write an equation and solve the problem. (Lessons 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12, 1-14, 1-15, 1-16, 1-18)

23. Zara arranged 80 stamps of her stamp collection in 10 equal rows. How many stamps were in each row?

_____

24. Olivia's CD rack has 4 shelves. It holds 8 CDs on a shelf. How many CDs will fit in the rack altogether?

_____

25. Extended Response Paco set up 7 tables to seat 28 children at his birthday party. The same number of children will sit at each table. How many children will sit at each table? Explain how you found your answer. Make a math drawing to help.

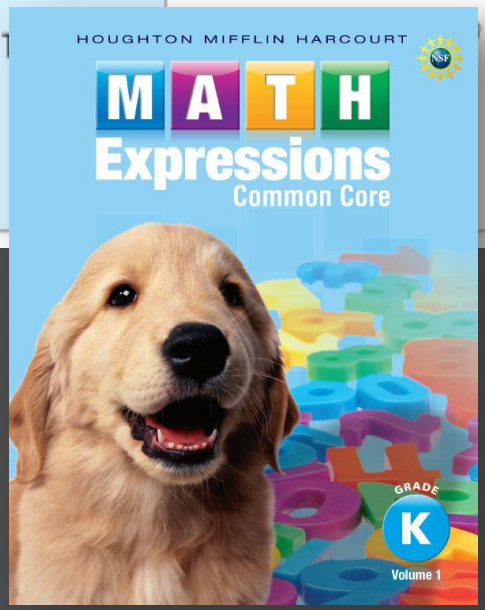
_____

_____

Problem Types

This table shows how problem types are incorporated across the grades. A specific grade level problem types chart can be found at the back of each Student Book or Teacher Edition.

	Result Unknown	Change Unknown	Start Unknown
Add to	Six children were playing tag in the yard. Three more children came to play. How many children are playing in the yard now? *Situation and Solution Equation:* $6 + 3 = c$	Six children were playing tag in the yard. Some more children came to play. Now there are 9 children in the yard. How many children came to play? *Situation Equation:* $6 + c = 9$ *Solution Equation:* $9 - 6 = c$	Some children were playing tag in the yard. Three more children came to play. Now there are 9 children in the yard. How many children were in the yard at first? *Situation Equation:* $c + 3 = 9$ *Solution Equation:* $3 + c = 9$ or $9 - 3 = c$
T	Jake has 10 trading cards. He gave 3 to his brother. How many trading cards does he have left? *Equation:*	Jake has 10 trading cards. He gave some to his brother. Now Jake has 7 trading cards left. How many cards did he give to his brother? *Situation Equation:* $10 - t = 7$ *Solution Equation:* $10 - 7 = t$	Jake has some trading cards. He gave 3 to his brother. Now Jake has 7 trading cards left. How many cards did he start with? *Situation Equation:* $t - 3 = 7$ *Solution Equation:* $7 + 3 = t$



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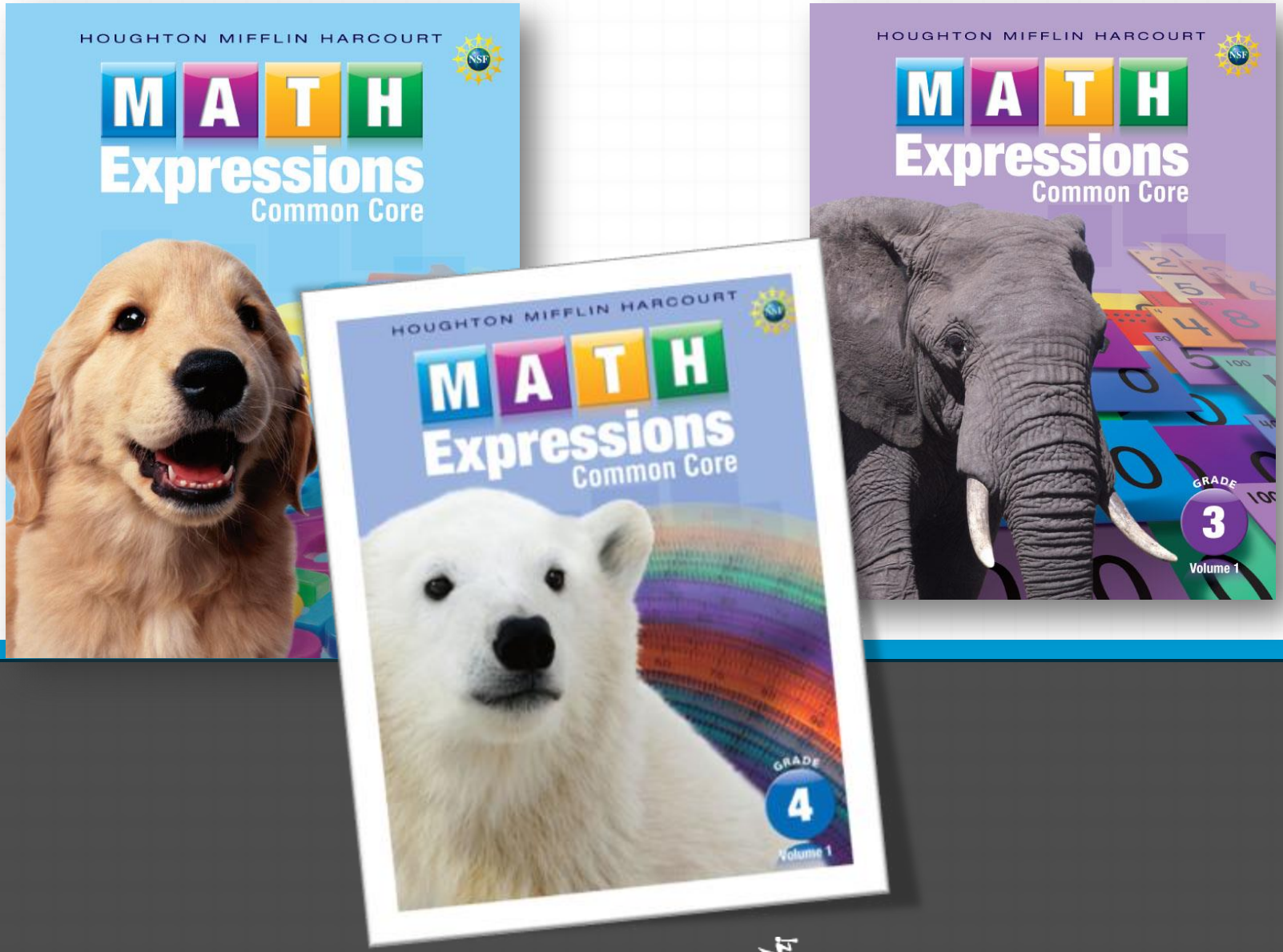

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