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math expressions

Lessons for Grades 2 and 4

SAMPLE

Unit 4: Lesson 8

Ungroup from the Left or from the Right

Mathematical Standards

Content Standards
2.PVO.1, 2.PVO.1a, 2.PVO.7, 2.PVO.9

Processes and Practices
MPP1, MPP2, MPP3, MPP5, MPP6, MPP8

Day at a Glance

What will children learn?
Children will learn when to ungroup in subtraction and they will learn to subtract a 2-digit number from any number less than 200.

1 Teaching the Lesson

Math Background for this lesson is included on page MB1-U4.

ACTIVITY **Subtraction with Ungrouping** (Student Activity Book: 179–180)

Why is this activity important?
Knowing when to ungroup helps solidify children's understanding of subtraction.

2 Differentiated Instruction

Math Activity Center

On-Level, Challenge and Intervention
- Activity Card / Writing Prompt for each level
- Practice, Reteach, and Challenge

Games
- *Poggles MX*
- *Subtraction Action*
- *Primary Vocabulary Game*

Math Reader
- *Comic Books for Sale*

Assessment and Intervention
Personal Math Trainer, Lesson 4-8

Formative assessment and step-by-step intervention.

Poggles MX: Addition and Subtraction ▶

3 Homework and Spiral Review

Homework and Remembering pp. 105–106

Home or School Activity
Social Studies Connection: Famous Landmarks

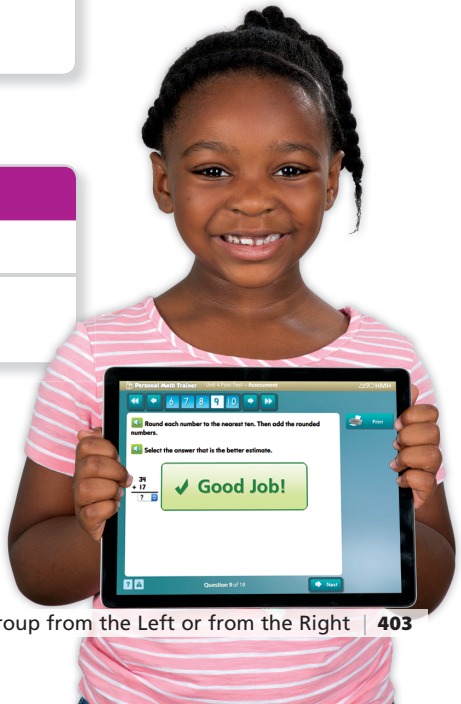
Quick Practice 5m
(See page QP1-U4.)
- Length Equivalents (H)
- Teen Subtraction Flash (I)

Daily Routines
(See page DR1-U4.)
- Count by 100s to 1,000
- Count Within 1,000 by Tens
- Count Dimes, Nickels, and Pennies to Equal a Quarter (25 cents)

Vocabulary

APP *For vocabulary fluency and fun*

Personal Math Trainer ▼



1 Teaching the Lesson

Individuals Pairs Groups Whole Class

ACTIVITY 60m

Subtraction with Ungrouping

Mathematical Standards

Content Standards
2.PVO.1, 2.PVO.1a, 2.PVO.7, 2.PVO.9

Processes and Practices
MPP1, MPP2, MPP3, MPP5, MPP6, MPP8

Focus
Decide whether ungrouping is necessary. Subtract a 2-digit number from a 3-digit number less than 200.

Materials
Student Activity Book pp. 179–180, MathBoard materials

Determine When and Why to Ungroup

MathTalk

Write these subtraction exercises on the board.

142	142
− 71	− 31
71	111

MP1 Make Sense of Problems | Analyze the Problem Give the children a few minutes to look at the exercises. Use the following questions to help children explain *when* and *why* they need to ungroup.

- *Look at 142 – 71. Are there enough ones to subtract from?* Yes *Why?* 2 is greater than 1.
- *Are there enough tens to subtract from?* No *Why?* 4 tens is less than 7 tens.
- *Do we need to ungroup to solve this exercise?* Yes *Why?* There are not enough tens to subtract from, so we need to ungroup 1 hundred.
- *Look at 142 − 31. Are there enough ones to subtract from?* Yes *Why?* 2 is greater than 1.
- *Are there enough tens to subtract from?* Yes *Why?* 4 tens is greater than 3 tens.
- *Do we need to ungroup to solve this exercise?* No *Why?* There are enough ones and tens to subtract from, so we don't need to ungroup anything.

MP8 Use Repeated Reasoning | Generalize Emphasize to children that they must first decide whether or not to ungroup before they begin solving any subtraction exercise. Children may enjoy making up a rule for deciding how to do this. You may want to have children demonstrate their rules on the board.

MP5 Use Appropriate Tools | MathBoard Ask volunteers to come to the board and review the steps for solving 3-digit subtraction exercises, using the Ungroup First Method. Then have children use their MathBoards to solve the two exercises from above. Instruct children to use the Ungroup First Method if they need to ungroup, rather than the Expanded Method.

Remind children to check their work either by adding or by making proof drawings with Quick Hundreds, Quick Tens, and circles. After children have completed the two exercises, have volunteers use the **Step by Step at the Board** structure to explain how they solved each of the exercises.

English Learners

Provide children with practice using ***greater than*** and ***less than*** to describe numbers. Draw a number line from 1 to 10 on the board.

Emerging

- *Is 5 greater than 4?* yes *Is 4 less than 5?* yes *Is 6 greater than 8?* no

Continue with other numbers.

Expanding

- *Which is greater, 4 or 5?* 5
- *4 is ___.* less than 5

Continue with other numbers.

Bridging

Have students work in pairs. One says two numbers; the other makes *greater than* and *less than* sentences.

Teaching Note

Emphasize the Ungroup First Method
The Expanded Method is helpful conceptually to understand ungrouping. But for two ungroupings it gets difficult for some children, and it does not generalize well to larger numbers. Beginning with this lesson, emphasize the Ungroup First Method, where students can choose whether to ungroup from the left or the right and whether to subtract from the left or the right. These choices generate productive math discussions, and the method generalizes to exercises with any number of places.

Continue Discussing Ungrouping

MathTalk

Write these subtraction exercises on the board.

157	133
− 96	− 14
61	119

Discuss these exercises with children.

- *Look at 157 − 96. Are there enough ones to subtract from?* Yes *Why?* 7 is greater than 6. *Are there enough tens to subtract from?* No *Why?* 5 tens is less than 9 tens.
- *Do we need to ungroup to solve this exercise?* Yes *Why?* There are not enough tens to subtract from, so we need to ungroup 1 hundred.
- *Look at 133 − 14. Are there enough ones to subtract from?* No *Why?* 3 is less than 4. *Are there enough tens to subtract from?* Yes *Why?* 3 tens is greater than 1 ten.
- *Do we need to ungroup to solve this exercise?* Yes *Why?* There are not enough ones to subtract from, so we need to ungroup 1 ten.

Then give children a few minutes to solve each exercise on their MathBoards. After children have finished, have volunteers use the **Step by Step at the Board** structure to explain how they solved each of the exercises.

Now provide children with more exercises of this kind to discuss. Encourage them to tell word problems to go with these exercises.

163	163	163
− 62	− 82	− 67
101	81	96

Ask children the following questions to help them with subtraction.

- *Look at 163 − 62. Does it require any ungrouping?* No *Why?* There are enough ones and enough tens to subtract from.
- *Look at 163 − 82. Does it require any ungrouping?* Yes *Why?* There are not enough tens to subtract from, so we need to ungroup 1 hundred.
- *Look at 163 − 67. Does it require any ungrouping?* Yes *Why?* There are not enough ones to subtract from, so we need to ungroup 1 ten. Then there will not be enough tens to subtract from, so we will need to ungroup 1 hundred.

MP2 Reason Abstractly and Quantitatively | Connect Symbols and Models Give children a few minutes to solve each exercise and to check their work by making proof drawings. After children have finished, have volunteers come to the board to explain how to solve each of the exercises.

Activity continued ▶

Teaching Note

Research Research indicates that when children ungroup the top number *before* they do any subtracting, they are less likely to make errors, particularly the "subtraction switch error" in which they subtract the top number from the bottom number. This error is even more likely to occur in 3-digit subtraction.

Ungrouping and renaming the top number helps to avoid this tendency because the renamed hundreds, tens, and ones are all in place before children do any subtracting. (Be sure, however, that children first determine where ungrouping is needed.)

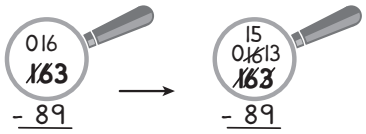
The common method alternates ungrouping and subtracting, so children are more likely to subtract top from bottom than when they ungroup first.

Decide When to Ungroup

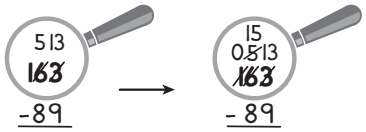
MathTalk

Children work in pairs on Student Activity Book pages 179–180. Pairs should discuss when to ungroup. Suggest that children try ungrouping from the left on some exercises and ungrouping from the right on other exercises so they can decide which they prefer.

Ungroup first, beginning at the left



Ungroup first, beginning at the right



MP3 Construct a Viable Argument | Compare Methods After children have finished the exercises, ask for volunteers to ungroup and subtract from the left and others to ungroup and subtract from the right. Discuss how these methods are alike and different, and why you get the same answer. Also discuss how you can subtract from the left or from the right because you have already fixed the top number to be ready to subtract everywhere.

After children complete Exercises 4 and 5, ask volunteers to show how to solve them by ungrouping from the left and ungrouping from the right. Then help children see that it is only the exercises with two ungroupings that look different when you ungroup from the left and when you ungroup from the right. Explain that the methods are different in action, but they only look different when there are two ungroupings.

Formative Assessment
Check Understanding

Children's responses should demonstrate their understanding of when it is necessary to ungroup to subtract.

Student Activity Book page 179

Unit 4 • **Lesson 8**

Name _____

Decide When to Ungroup

Decide if you need to ungroup. Then subtract. Children's ungrouping may vary.

1. 163 − 89 = 74
   Did you ungroup a ten to get more ones? yes
   Did you ungroup a hundred to get more tens? yes
2. 134 − 73 = 61
   Did you ungroup a ten to get more ones? no
   Did you ungroup a hundred to get more tens? yes
3. 158 − 37 = 121
   Did you ungroup a ten to get more ones? no
   Did you ungroup a hundred to get more tens? no
4. 138 − 59 = 79
   Did you ungroup a ten to get more ones? yes
   Did you ungroup a hundred to get more tens? yes
5. 146 − 57 = 89
   Did you ungroup a ten to get more ones? yes
   Did you ungroup a hundred to get more tens? yes
6. 146 − 35 = 111
   Did you ungroup a ten to get more ones? no
   Did you ungroup a hundred to get more tens? no

Content Standards 2.PVO.1, 2.PVO.1a, 2.PVO.7, 2.PVO.9
Processes and Practices MPP1, MPP2, MPP3, MPP8

Student Activity Book page 180

Unit 4 • **Lesson 8**

Decide When to Ungroup (continued)

Decide if you need to ungroup. Then subtract. Children's ungrouping may vary.

7. 167 − 42 = 125
   Did you ungroup a ten to get more ones? no
   Did you ungroup a hundred to get more tens? no
8. 148 − 39 = 109
   Did you ungroup a ten to get more ones? yes
   Did you ungroup a hundred to get more tens? no
9. 124 − 86 = 38
   Did you ungroup a ten to get more ones? yes
   Did you ungroup a hundred to get more tens? yes
10. 150 − 27 = 123
    Did you ungroup a ten to get more ones? yes
    Did you ungroup a hundred to get more tens? no

Check Understanding

Circle the correct answer to complete each sentence.

If there are enough tens to subtract from, I _____ need to ungroup. do / (do not)

If there are not enough ones to subtract from, I _____ need to ungroup. (do) / do not

Math Activity Center

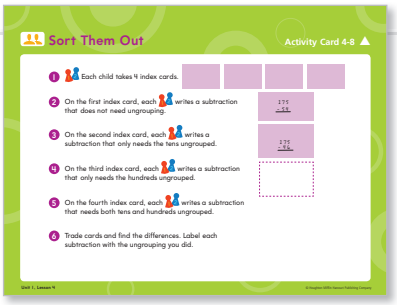
Hands-On • Print • Interactive Digital Games and Resources

Adaptive | Individuals | Pairs | Groups

ON-LEVEL RESOURCES

Hands-On
Activity Card, Lesson 4-8: *Sort Them Out*

Digital and Print
Practice, Lesson 4-8



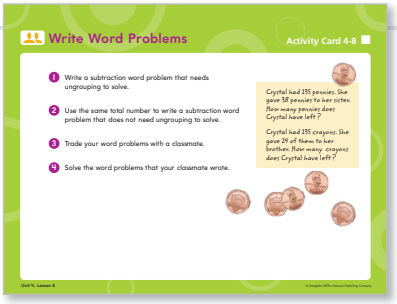
Math Writing Prompt
Explain Your Thinking In which subtraction do you have to ungroup twice? Find the answer. Write what you have to ungroup.

138 − 46 | 138 − 39

CHALLENGE RESOURCES

Hands-On
Activity Card, Lesson 4-8: *Write Word Problems*

Digital and Print
Challenge, Lesson 4-8



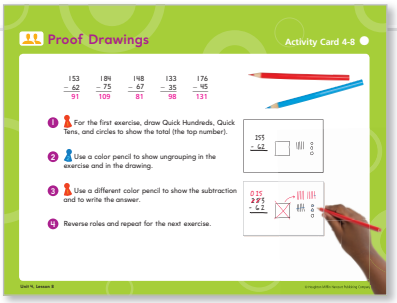
Math Writing Prompt
What's Wrong? Look at Remah's subtraction. What did she do wrong? Find the correct answer.

18
148
− 49
109

INTERVENTION RESOURCES

Hands-On
Activity Card, Lesson 4-8: *Proof Drawings*

Digital and Print
Reteach, Lesson 4-8



Math Writing Prompt
How Do You Know? Make a drawing to show that the amounts below are the same.

1 hundred 4 tens 8 ones

14 tens 8 ones

MORE RESOURCES

Games

Practice | Reinforce | Extend subtraction of 2-digit numbers

- *Poggles MX*
- *Subtraction Action*
- *Primary Vocabulary Game*

Math Reader

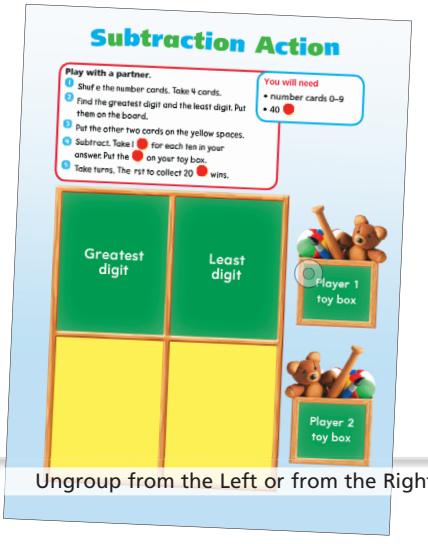
- *Comic Books for Sale*

Assessment and Intervention

Personal Math Trainer, Lesson 4-8
Personalized intervention and enrichment with learning supports

▼ Personal Math Trainer

▼ *Subtraction Action* Gameboard



❸ Homework and Spiral Review

HOMEWORK

Goal: Additional Practice

This Homework page provides practice in deciding whether ungrouping is necessary to subtract.

Homework and Remembering page 105

4-8 Homework

Name _____

Decide if you need to ungroup. Then subtract.

❶ 147 − 32 = 115	❷ 147 − 38 = 109	❸ 147 − 48 = 99
❹ 126 − 54 = 72	❺ 126 − 57 = 69	❻ 126 − 97 = 29
❼ 187 − 46 = 141	❽ 187 − 49 = 138	❾ 187 − 99 = 88
❿ 172 − 35 = 137	⓫ 172 − 85 = 87	⓬ 172 − 31 = 141

REMEMBERING

Goal: Spiral Review

This Remembering activity is appropriate anytime after today's lesson.

Homework and Remembering page 106

4-8 Remembering

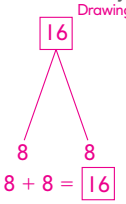
Name _____

Make a drawing. Write an equation. Solve the problem.

❶ The coach gives out 8 large water bottles and 8 small water bottles. How many water bottles does the coach give out?

16 water bottles (label)

Show your work. Drawings will vary.



Add. Use any method.

❷ 66 + 77 = 143	97 + 84 = 181	53 + 79 = 132

Subtract.

❸ 200 − 41 = 159	200 − 73 = 127	200 − 57 = 143

❹ **Stretch Your Thinking** Use the numbers below to complete the subtraction problem. Place the numbers so that you must ungroup two times. Then subtract.

3 6 9 5

Answers will vary.

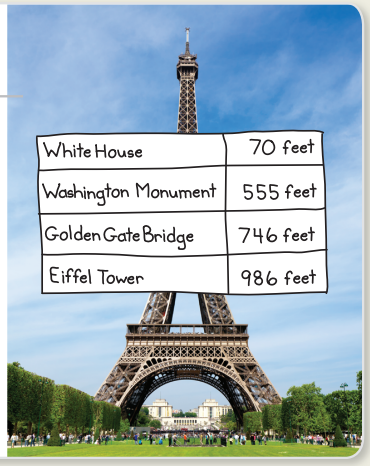
1	3	5
−	9	6
	3	9

Home or School Activity

Social Studies Connection

Famous Landmarks Display pictures of several landmarks. Have children discuss what they know about any of the landmarks.

Children can find the actual height of four landmarks and make a chart to display the information. Then have them write three subtraction questions comparing the heights of the different landmarks. When they have finished, have children give their problems to a classmate to solve.



Unit 1: Lesson 11

Subtract Greater Numbers

Mathematics Learning Stand
Mathematical Content
4.ARO.3, 4.PVO.4
Mathematical Practices
MPP1, MPP3, MPP6, MPP8

Day at a Glance

What will students learn?
Students will learn to use methods for ungrouping to subtract two whole numbers.

1 Teaching the Lesson

Math Background for this lesson is included on page MB1-U1.

ACTIVITY 1 **Subtract From Greater Numbers**

Why is this activity important?
Subtracting from greater numbers and discussing when ungrouping is necessary will build students' fluency with subtraction.

ACTIVITY 2 **Check Subtraction** (Student Activity Book: 31–32)

Why is this activity important?
Exploring ways to check subtraction provides students with ways to decide if their answers are reasonable.

2 Differentiated Instruction

Math Activity Center

On-Level, Challenge, and Intervention
- Activity Card / Writing Prompt for each level
- Practice, Reteach, and Challenge

Games
- *Poggles MX*
- *Who's the Closest?* Gameboard
- *Intermediate Vocabulary Game*

Math Reader
- *The First Space Vacation*

Assessment and Intervention
Personal Math Trainer, Lesson 1-11
Formative assessment and step-by-step intervention.

Poggles MX: Intermediate ▶

3 Homework and Spiral Review

Homework and Remembering pp. 21–22

Home or School Activity
Social Studies Connection: Numbers in the News

Quick Practice 5m

(See page QP1-U1.)
- Write, Compare, Say (B-8)

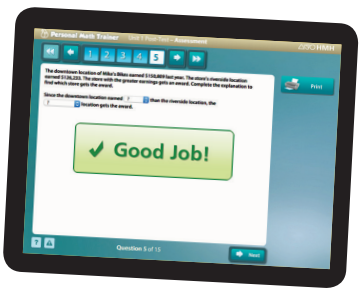
Anytime Problem

In a game, four players scored 30, 40, 60, and 80 points. Raj had the highest score. Theo scored 10 points less than Kate. Jenny also played. Which player had each score? Raj 80, Jenny 60, Kate 40, Theo 30

Vocabulary

Study POP! **APP** *For vocabulary fluency and fun*

Personal Math Trainer ▼



1 Teaching the Lesson

Individuals Pairs Groups Whole Class

ACTIVITY 1 25m

Subtract From Greater Numbers

Mathematics Learning Standards
Mathematical Content
4.PVO.4
Mathematical Practices
MPP3, MPP6, MPP8

Focus
Subtract from greater numbers and discuss when ungrouping is necessary.

Ungroup With Greater Numbers

MathTalk

Student-Generated Methods Write the following subtraction on the board.

$$\begin{array}{r} 86{,}402 \\ -\ 78{,}369 \\ \hline \end{array}$$

- *How would you subtract these numbers?*

Most students should be able to apply the strategies they learned for subtracting from thousands. Volunteers should work at the board using different methods while other students work at their desks.

- *Why must the place values be aligned?* We can only subtract like place values.
- *When do we need to ungroup?* Ungrouping is needed when the top digit is less than the bottom digit. The top number needs to be great enough to subtract from.

Direct students to do all necessary ungrouping first.

$$\begin{array}{r} {\scriptstyle 716\ 3\not{1}\not{0}12}\ {\scriptstyle 9} \\ \not{8}\not{6},\not{4}\not{0}2 \\ -\ 78{,}369 \\ \hline 8{,}033 \end{array}$$

- Have one student explain ungrouping left to right.
- Have a different student explain ungrouping right to left.
- The whole class does the subtractions either left to right or right to left.

MPP8 **Generalize** Students should discuss the different solution methods they used and relate them to subtraction from thousands. Elicit from students that they can use the same methods to subtract regardless of the number of digits. Suggest students use the following subtraction to support their conclusions.

507,216 – 92,567

A possible method is shown.

$$\begin{array}{r} {\scriptstyle 4106\ \not{5}\not{0}\not{7},2\not{1}\not{0}16}\ {\scriptstyle 1110} \\ \not{5}\not{0}\not{7},2\not{1}\not{6} \\ -\ 92{,}567 \\ \hline 414{,}649 \end{array}$$

Learning Community

Best Practices | Helping Community
Some students are initially reluctant to explain their thinking. As you respond positively to student efforts to talk about their thinking, your class will realize that there is an expectation in the math community to respond positively to one another. More students will then desire to make their math thinking the center of discussion.

Class Management

Looking Ahead Keep one correct version of the last example on the board for the next activity.

ACTIVITY 2 35m

Check Subtraction

Mathematics Learning Standards
Mathematical Content
4.ARO.3, 4.PVO.4
Mathematical Practices
MPP1, MPP3, MPP6

Focus
Explore ways to check subtraction.

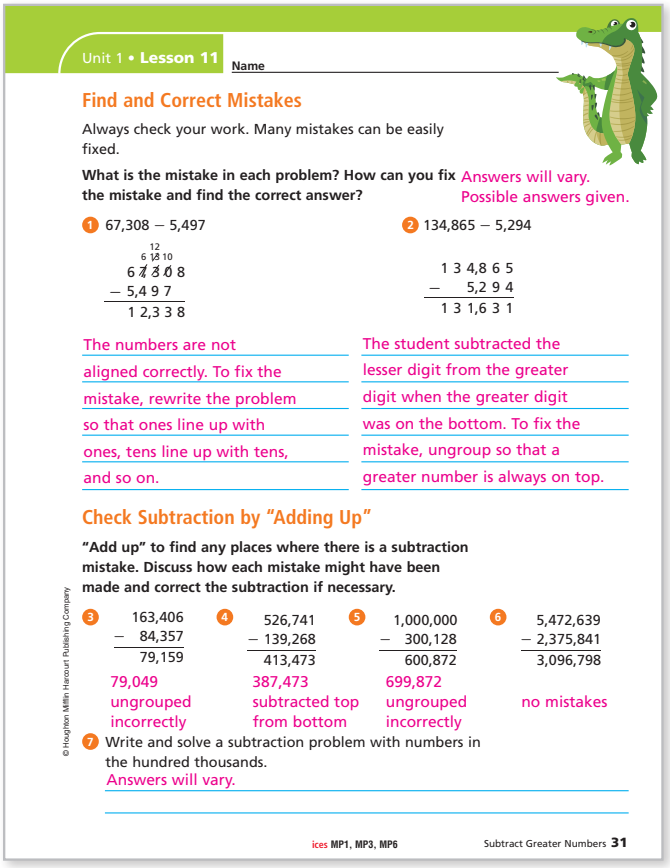
Materials
Student Activity Book pp. 31–32, MathBoard materials

Find and Correct Mistakes

MPP3 Use and Evaluate Logical Reasoning Students should discuss the conceptual mistakes shown in Exercises 1 and 2 on Student Activity Book page 31. Two groups can present their work at the board.

- In Exercise 1, the places are not properly aligned. Ones must be subtracted from ones, and so on. Students should rewrite the exercise with correct alignment and find the correct answer. 61,811
- In Exercise 2, no ungrouping has been done. One hundred should have been ungrouped to make more tens. Instead, the lesser digit was subtracted from the greater digit. The same mistake was made in the thousands place. Students should ungroup as needed and find the correct answer. 129,571

Student Activity Book page 31



Unit 1 • Lesson 11 Name

Find and Correct Mistakes

Always check your work. Many mistakes can be easily fixed.

What is the mistake in each problem? How can you fix the mistake and find the correct answer? Answers will vary. Possible answers given.

1. 67,308 − 5,497

$$\begin{array}{r} {\scriptstyle 12}\\ {\scriptstyle 6\ 13\ 10}\\ 6\not{7}\not{3}\not{0}8\\ -\ 5,4\,9\,7\\ \hline 1\,2,3\,3\,8 \end{array}$$

The numbers are not aligned correctly. To fix the mistake, rewrite the problem so that ones line up with ones, tens line up with tens, and so on.

2. 134,865 − 5,294

$$\begin{array}{r} 1\,3\,4,8\,6\,5\\ -\quad 5,2\,9\,4\\ \hline 1\,3\,1,6\,3\,1 \end{array}$$

The student subtracted the lesser digit from the greater digit when the greater digit was on the bottom. To fix the mistake, ungroup so that a greater number is always on top.

Check Subtraction by "Adding Up"

"Add up" to find any places where there is a subtraction mistake. Discuss how each mistake might have been made and correct the subtraction if necessary.

3. $\begin{array}{r} 163,406\\ -\ 84,357\\ \hline 79,159 \end{array}$ 79,049 ungrouped incorrectly

4. $\begin{array}{r} 526,741\\ -\ 139,268\\ \hline 413,473 \end{array}$ 387,473 subtracted top from bottom

5. $\begin{array}{r} 1,000,000\\ -\ 300,128\\ \hline 600,872 \end{array}$ 699,872 ungrouped incorrectly

6. $\begin{array}{r} 5,472,639\\ -\ 2,375,841\\ \hline 3,096,798 \end{array}$ no mistakes

7. Write and solve a subtraction problem with numbers in the hundred thousands.
Answers will vary.

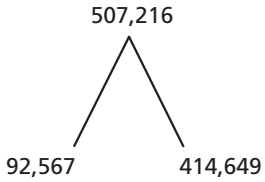
Activity continued ▶

Inquiry

Analyzing another student's work to find errors requires that a student reflect on what he or she knows about the process involved. As students discuss the possible errors in Exercises 1 and 2, use guiding questions rather than pointing out the errors so that they do the work of finding the errors. Seeing why an incorrect method does not work motivates students to work correctly as they carry out multidigit subtractions with ungrouping.

Check Subtraction by "Adding Up"

MPP1 **Problem Solving | Check Answers** To review the relationship between addition and subtraction, draw this break-apart drawing on the board.



Ask students to discuss how the diagram shows both subtraction and addition. If you subtract either bottom number from the top number, you get the other bottom number as the answer. If you add the two bottom numbers, you get the top number as the answer.

Have students discuss how they could use this knowledge to check subtraction. Try to elicit the following method: You can check subtraction by "adding up." Add the answer and the bottom number (the addends in an addition) to get the top number (the total in an addition).

"Adding Up" Method to Check Subtraction The "adding up" method is shown below. The new groups are shown as 1s in the appropriate columns just below the answer in the subtraction.

$$\begin{array}{r} 507{,}216 \\ -\ 92{,}567 \\ \hline 414{,}649 \\ {\scriptstyle 1\quad 1\ 1\ 1} \end{array}$$

Students can take turns adding place values, beginning with the ones place.

- Add the ones bottom to top: $9 + 7 = 16$. The 16 is consistent with the 6 that is already at the top of the ones column. Write a 1 for the grouped ten at the bottom of the tens column.
- Add the tens bottom to top: $1 + 4 + 6 = 11$. The 11 is consistent with the 1 that is already at the top of the tens column. Write a 1 for the grouped hundred at the bottom of the hundreds column.
- Continue "adding up" in the other places.
- The total is 507,216.

English Learners

Write the word ***inverse*** on the board. Review the meaning and inverse operations.

Emerging

- *Does inverse mean "opposite"?* yes
- *Addition is the inverse of …?* subtraction *We can use addition to check …?* subtraction

Expanding

- *What does inverse mean?* opposite *What is the inverse of subtraction?* addition *What can we check with addition?* the answer to a subtraction problem

Bridging

Have students work in pairs. One partner names an addition, subtraction, multiplication, or division equation. The other names the inverse operation that could be used to check the answer.

Teaching Note

Language and Vocabulary The mathematical word for the relationship between addition and subtraction is *inverse*. Students may also use *opposite, reverse, undoing,* or some other description.

Check Subtraction by "Adding Up" *(continued)*

Have several students work at the board while the others work at their seats to check Exercise 3 on Student Activity Book page 31. Remind students to check by "adding up."

Students should discuss their findings. Refer student questions to the class for resolution whenever possible.

Students can work through Exercises 4–6 by themselves while you walk around and check for understanding.

Ask different students to discuss the errors they found. Explanations for the errors are listed below:

3	163,406 − 84,357 79,159	Ungrouped incorrectly in the tens and hundreds places. Correct Answer: 79,049
4	526,741 − 139,268 413,473	Subtracted top from bottom in ten thousands and thousands places. Correct Answer: 387,473
5	1,000,000 − 300,128 600,872	Ungrouped incorrectly in ten thousands and thousands places. Correct Answer: 699,872
6	5,472,639 − 2,375,841 3,096,798	No mistakes

After students have written six-digit subtraction problems for Exercise 7, have them exchange papers, complete the subtraction, and add up to check.

Estimate to Check

MPP1 **Problem Solving | Reasonable Answers** Discuss how to round greater numbers to check Exercises 3–6.

Rounding to the Nearest Ten Thousand In Exercise 3, we can use rounding and estimation to predict or check the answer.

- *Think about rounding the numbers in Exercise 3 to the nearest ten thousand. Which digit in each number is in the rounding place?* 163,406: 6; 84,357: 8
- *Why are the digits in the thousands places of these numbers important?* The digits in the thousands places tell us if the digits in the ten thousands places must increase by 1 or stay the same.
- *Does each number round up or round down? Why?* Each number rounds down because the digit in the thousands place of each number is less than 5.
- *Round each number to the nearest ten thousand.* 163,406 rounds to 160,000; 84,357 rounds to 80,000
- *What is a reasonable estimate for the difference of these numbers?* 160,000 − 80,000 = 80,000

Rounding to the Nearest Hundred Thousand Remind students that rounding rules remain the same for any number of digits. For Exercises 4–6, students should round to the nearest hundred thousand to check their answers. Use questions similar to those above.

Activity continued ▶

Learning Community

MathTalk **Best Practices** Encourage students to respond before you do, especially to other students' questions. Allow time for students to make comments or ask questions about each other's work before you begin to speak. If you tend to speak first, the students will not take ownership of their role as crucial participants in the discourse; they will look to you instead.

Estimate Differences

MPP1 Problem Solving | Reasonable Answers Have the class read the introduction about Dan's subtraction on Student Activity Book page 32.

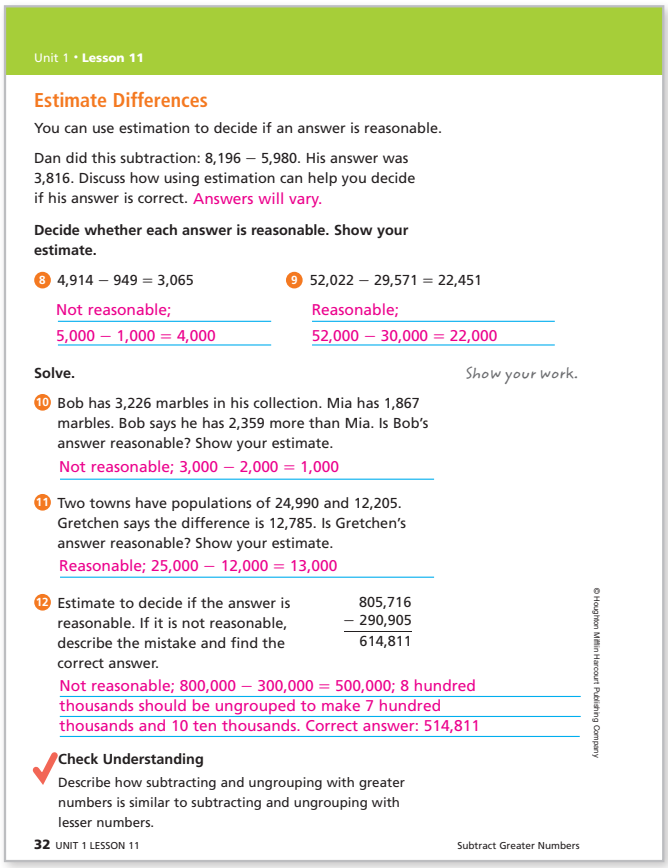
- *How do we decide if Dan's answer is reasonable?* Round to the nearest thousand. 8,000 − 6,000 = 2,000
- *Is Dan's answer reasonable?* probably not
- *What mistake did Dan make, and how might you fix it?* Dan subtracted the top digit from the bottom digit in the hundreds place. He should have ungrouped 8 thousands to make 7 thousands and 10 hundreds. The correct answer is 2,216.

Have students discuss Exercises 8–12 in small groups.

Formative Assessment
Check Understanding

Students should generalize that they can use the same methods to ungroup regardless of the number of digits.

Student Activity Book page 32



Unit 1 • **Lesson 11**

Estimate Differences

You can use estimation to decide if an answer is reasonable.

Dan did this subtraction: 8,196 − 5,980. His answer was 3,816. Discuss how using estimation can help you decide if his answer is correct. Answers will vary.

Decide whether each answer is reasonable. Show your estimate.

8. 4,914 − 949 = 3,065
   Not reasonable; 5,000 − 1,000 = 4,000
9. 52,022 − 29,571 = 22,451
   Reasonable; 52,000 − 30,000 = 22,000

Solve. *Show your work.*

10. Bob has 3,226 marbles in his collection. Mia has 1,867 marbles. Bob says he has 2,359 more than Mia. Is Bob's answer reasonable? Show your estimate.
    Not reasonable; 3,000 − 2,000 = 1,000
11. Two towns have populations of 24,990 and 12,205. Gretchen says the difference is 12,785. Is Gretchen's answer reasonable? Show your estimate.
    Reasonable; 25,000 − 12,000 = 13,000
12. Estimate to decide if the answer is reasonable. If it is not reasonable, describe the mistake and find the correct answer.

    805,716
    − 290,905
    614,811

    Not reasonable; 800,000 − 300,000 = 500,000; 8 hundred thousands should be ungrouped to make 7 hundred thousands and 10 ten thousands. Correct answer: 514,811

Check Understanding

Describe how subtracting and ungrouping with greater numbers is similar to subtracting and ungrouping with lesser numbers.

Teaching Note

Math Background In many situations, there is no "right way" to estimate. Estimating is often a matter of judgment, which can vary depending on the numbers involved and the purpose of the estimate. In Exercise 11, a student might estimate by rounding to the nearest ten thousand: 20,000 − 10,000 = 10,000. This is acceptable, but may not be "the best way."

Emphasize the main purpose of this activity—to determine whether answers are reasonable. This is a habit that should be strongly encouraged.

Math Activity Center

Hands-On • Print • Interactive Digital Games and Resources

Adaptive | Individuals | Pairs | Groups

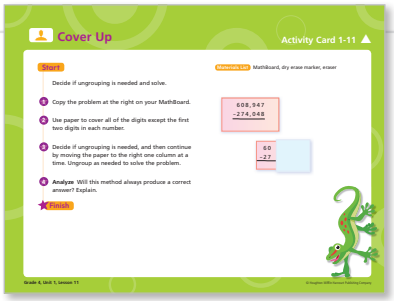
ON-LEVEL RESOURCES

Hands-On

Activity Card, Lesson 1-11: *Cover Up*

Digital and Print

Practice, Lesson 1-11



Math Writing Prompt

Investigate Math Explain how subtracting 56,000 from 84,000 is similar to subtracting 56 from 84. Compare the answers.

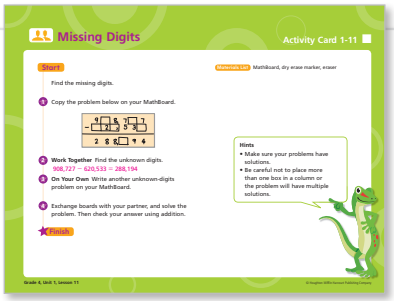
CHALLENGE RESOURCES

Hands-On

Activity Card, Lesson 1-11: *Missing Digits*

Digital and Print

Challenge, Lesson 1-11



Math Writing Prompt

Explain Your Thinking You buy four items at a store, but the receipt is smudged and you cannot read the cost of one item. Explain how you can find the missing cost.

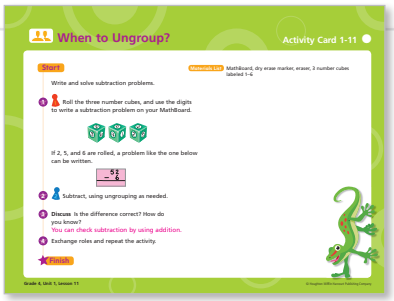
INTERVENTION RESOURCES

Hands-On

Activity Card, Lesson 1-11: *When to Ungroup?*

Digital and Print

Reteach, Lesson 1-11



Math Writing Prompt

Define Your Work Break the word *ungroup* into "un" and "group." Define each part of the word. Give another example of a word that starts with *un-* and define it.

MORE RESOURCES

Games

Practice | Reinforce | Extend
place value, addition and subtraction

- *Poggles MX*
- *Who's the Closest?*
- *Intermediate Vocabulary Game*

Math Reader

- *The First Space Vacation*

Assessment and Intervention

Personal Math Trainer, Lesson 1-11
Personalized intervention and enrichment with learning supports

▼ Personal Math Trainer

▼ *The First Space Vacation* (Math Reader)

❸ Homework and Spiral Review

HOMEWORK

Goal: Formative Assessment

✓ Include students' completed Homework page as part of their portfolios.

Homework and Remembering page 21

1-11 Homework Name _____ Date _____

Subtract.

❶ 71,824 − 36,739 = 35,085	❷ 960,739 − 894,045 = 66,694	❸ 665,717 − 82,824 = 582,893	❹ 372,608 − 57,425 = 315,183
❺ 597,603 − 404,980 = 192,623	❻ 614,702 − 539,508 = 75,194	❼ 724,359 − 99,068 = 625,291	❽ 394,280 − 56,473 = 337,807

In an experiment, a scientist counted how many bacteria grew in several labeled dishes. The table shows how many bacteria were in each dish.

Dish	Number of Bacteria
A	682,169
B	694,154
C	57,026
D	150,895
E	207,121

Solve. Estimate to check. *Show your work.*

❾ What was the difference between the greatest number of bacteria and the least number of bacteria?
637,128 bacteria

❿ How many more bacteria were in dish A than in dish D?
531,274 more bacteria

⓫ How many fewer bacteria were in dish E than in the combined dish C and dish D?
800 fewer bacteria

REMEMBERING

Goal: Spiral Review

This Remembering activity would be appropriate anytime after today's lesson.

Homework and Remembering page 22

1-11 Remembering Name _____ Date _____

Write an equation that shows an estimate of each answer. Then write the exact answer. Estimates may vary.

❶ 503 + 69 estimate: 500 + 70 = 570; exact: 572

❷ 2,825 + 212 estimate: 2,800 + 200 = 3,000; exact: 3,037

❸ 6,190 + 3,858 estimate: 6,000 + 4,000 = 10,000; exact: 10,048

Subtract. Show your new groups.

❹ 8,760 − 1,353 = 7,407	❺ 6,000 − 5,258 = 742	❻ 5,060 − 2,175 = 2,885

Subtract. Then use addition to check the subtraction. Show your work.

❼ 6,355 − 891 = 5,464

❽ 8,326 − 1,425 = 6,901

Check: 5,464 + 891 = 6,355

Check: 6,901 + 1,425 = 8,326

❾ **Stretch Your Thinking** Write an addition word problem in which the estimated sum is 14,000.
Possible answer: Brandon walks 2,750 steps on Tuesday and 4,218 steps on Wednesday. He walks 6,854 steps on Friday. About how many steps does Brandon walk during these three days?

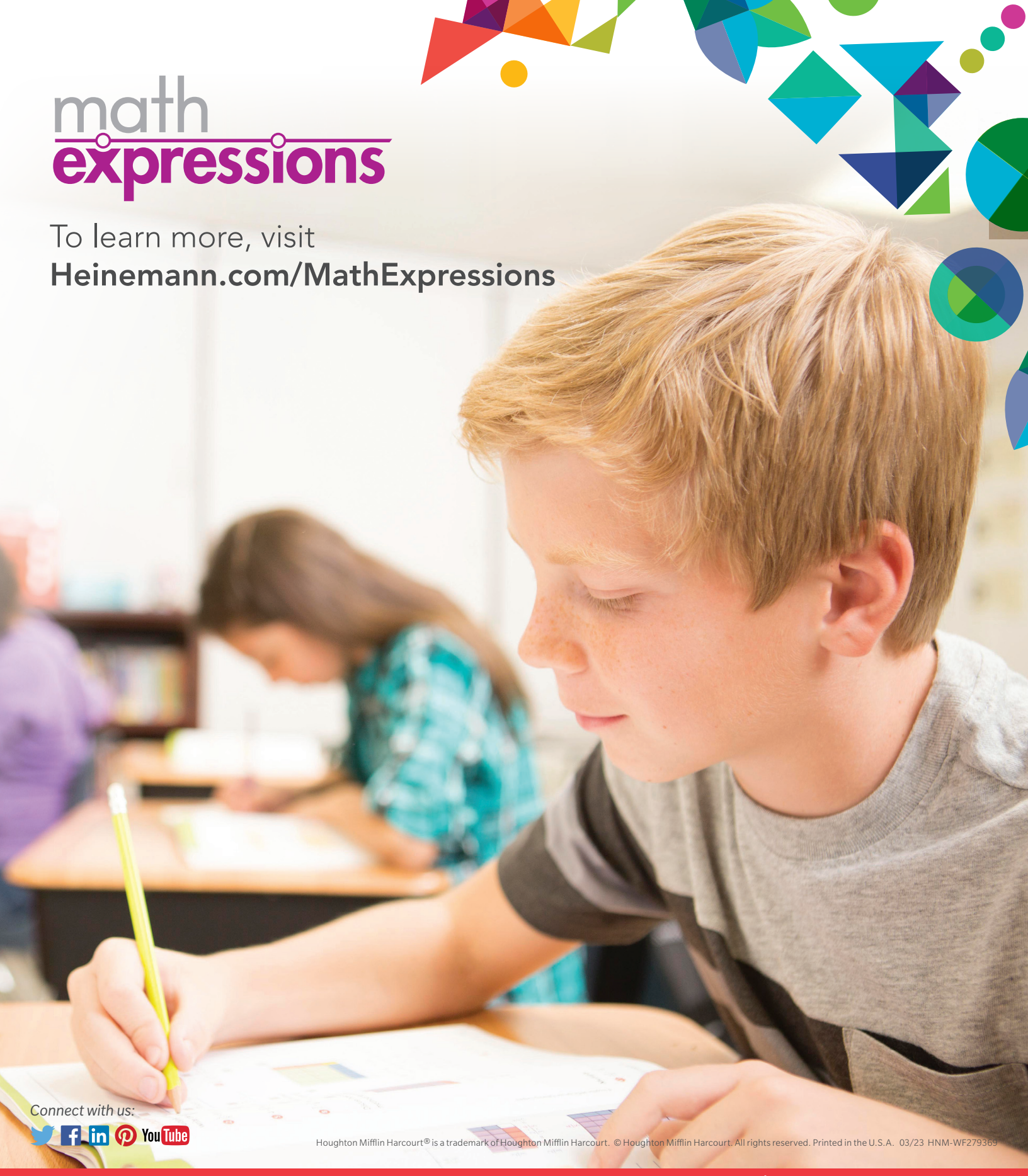
Home or School Activity

Social Studies Connection

Numbers in the News Have students find articles in newspapers, magazines, or on the Internet that contain greater numbers. Ask them to bring in the articles. Have the class use them as a basis for practice with adding, subtracting, and using one operation to check an answer for the other operation.

Notes

Notes



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