

Subtract With Zeros

FOCUS

Mathematics Objective Use number sense, the standard algorithm, and regrouping to subtract with zeros.

Language Objective Explain how the process for subtraction changes, or stays the same, when there are zeros in the numbers.

Essential Understanding The standard algorithm for subtraction is the same regardless of whether there are 0s in the numbers.

COHERENCE

Look Back Previously in this topic, students subtracted multi-digit whole numbers using the standard algorithm.

This Lesson Students subtract whole numbers with zeros using the standard algorithm.

Look Ahead Later, students will subtract multi-digit decimals.

Additional Connection The standard algorithm for subtracting multi-digit whole numbers is used in solving multi-step word problems, and estimating by rounding is used to check for answer reasonableness.

RIGOR

Conceptual Understanding Students understand that when subtracting with zeros, they may need to regroup in more than one place.

Procedural Skill Students recognize that for subtraction that includes zeros in the minuend using the standard algorithm requires computation to go from right to left, regrouping as needed.

Vocabulary

Revisit previously taught vocabulary.

Materials

- Place-value charts (or Teaching Tool 30), optional

Student Resources

 Family Engagement

Intervention System (IS)

G15 Subtracting 4-Digit Numbers

G16 Subtract Across Zero

Teacher Resources

Available at
Savvas Realize®.

 Editable Lesson Plan

 Lesson Presentation Slides

 enVision on the Go: Planning Support



Notes

Language Support

Language and Math Connections Use this activity for the Explore and Share. After they read the problem, discuss the word *kilometer* and establish that distance is being measured in kilometers in this problem. Then ask what the word *farther* means. Finally, provide a blank bar diagram.

Ask: **What numbers are given?** [Sample answer: The number of kilometers London and Tokyo are from the South Pole.]

Ask: **What is the unknown number?** [Sample answer: The difference between the distances.]

Have students work with partners to discuss ways to find the unknown number.

An additional activity is available online.

- Use the activity about using objects with the Visual Learning.

Math Talk

Number Detective

What is the number?

The number rounded to the nearest 100 is 600.
The number rounded to the nearest 10 is 590.
The number is odd.
The number is less than 587.

Answer:
585

Problem Solving Have students examine the clues, one at a time, and consider what the mystery number might be after each clue is revealed. Students should discuss their strategies in pairs before joining a class discussion.

Exit Ticket



Name _____

Lesson **2-8**
Exit Ticket

1. What is the difference between 7,000 and 3,296?

- ☐ A 4,704
☐ B 3,814
☐ C 4,814
☒ D 3,704

2. What is the difference of 5,020 – 1,203?

- ☒ A 3,817
☐ B 4,223
☐ C 6,223
☐ D 4,817

3. What is the difference of 302,509 – 251,082?

- ☐ A 151,587
☒ B 51,427
☐ C 53,587
☐ D 100,437

Have you met the lesson goals?

Math Goal

I can use the standard algorithm to subtract from numbers with zeros.



☐ I Can



☐ With Help



☐ Not Yet

Language Goal

I can explain how my steps change or stay the same when I subtract with zeros.



☐ I Can



☐ With Help



☐ Not Yet

Teacher Answer Key

Assessment 1 of 1

Copyright © Savvas Learning Company LLC. All Rights Reserved.

Auto-scored version online

Use the Exit Ticket results to support students as needed by reminding them that they may need to regroup several place values to subtract with zeros.

$$\begin{array}{r} 4,000 \\ - 1,236 \\ \hline \end{array} \qquad \begin{array}{r} 50,040 \\ - 24,301 \\ \hline \end{array}$$

English Language Development

ELL English Language Learners (Visual Learning)

ELL English Language Learners (Practice and Problem Solving)

MLR6 Three Reads (Visual Learning)

Language Support (Explore and Share)

Step 1 Explore and Share

10-15 min

Explore and Share

Scout Observational Assessment

ETP Explore and Share

Formative Assessment

Purpose Investigate using the standard algorithm to subtract numbers with zeros.

Materials Place-value charts (or Teaching Tool 30), optional

Introduce WHOLE CLASS

Ask: What is the farthest distance you traveled?

Monitor, Select, and Sequence SMALL GROUP

Observe students at work.

- **Do students know which operation to use?** They might add the numbers rather than subtract.

Look for solutions that use the standard algorithm. If students use that algorithm to subtract, ask: *What place values did you need to regroup?*

Select solutions for students to present. For $15,710 - 13,953$, show solutions that did not use the standard algorithm correctly (Ali) before solutions that did (Taylor).

Early Finishers

Ask: For $15,710 - 13,953$, how could you check your answer? [I could add the answer to 13,953 and make sure it equals 15,710.]

Connect WHOLE CLASS

Connect Solution Strategies Discuss students' work.

Both Taylor and Ali used the standard algorithm to subtract. Taylor understood that the numbers change when regrouped, however, Ali failed to record that he had 1 less thousand when he regrouped.

Connect to the Visual Learning During the Visual Learning, connect to student work in Explore and Share. Be sure students understand that the subtraction algorithm for subtracting with zeros may require regrouping more than one place value.

Name _____

Subtract with Zeros

I can ... use the standard algorithm to subtract from numbers with zeros.

Let's Build

Lesson
2-8

Explore and Share

The sign shows the distance from each city to the South Pole. How much farther is London than Tokyo from the South Pole? Show your work. Be ready to explain. **Solve this problem any way you choose.**

See margin for sample student work.

Use **reasoning** to decide what operation you will use to compare two distances.

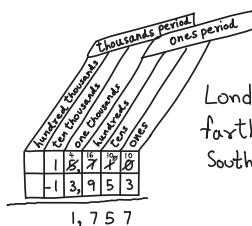


South Pole

London, England
15,710 km

Tokyo, Japan
13,953 km

Sample Student Work



London is 1,757 km farther from the South Pole than Tokyo.

Taylor's Work

Taylor used a place-value chart and the standard algorithm to find the correct answer.

Ali's Work

Ali used the standard algorithm but failed to record that he had one less thousand in the thousand's place after regrouping. This gave him the incorrect difference.

$$\begin{array}{r} 15,710 \\ - 13,953 \\ \hline 2,757 \end{array}$$

Visual Learning Animation

Essential Question

How Do You Subtract with Zeros?

Visual Learning

A A music hall is hosting a concert. The hall sells 4,678 tickets to the show. How many tickets are still available?

6,000

4,678

t

$t = 6,000 - 4,678$
Estimate: $6,000 - 4,700 = 1,300$

When subtracting from a number with zeros, you may need to regroup several places before subtracting.

Let t equal the number of available tickets.

B Regroup.

$$\begin{array}{r} 6,000 \\ - 4,678 \\ \hline \end{array}$$

Because of the zeros, you need to start regrouping from the thousands.

$$\begin{array}{r} 5\cancel{0}^{10}00 \\ - 4,678 \\ \hline \end{array}$$

6 thousands = 5 thousands + 10 hundreds

$$\begin{array}{r} 5\cancel{0}^{10}00 \\ - 4,678 \\ \hline \end{array}$$

10 hundreds = 9 hundreds + 10 tens

$$\begin{array}{r} 5\cancel{0}^{10}00 \\ - 4,678 \\ \hline \end{array}$$

10 tens = 9 tens + 10 ones

$$\begin{array}{r} 5\cancel{0}^{10}00 \\ - 4,678 \\ \hline \end{array}$$

C Subtract.

$$\begin{array}{r} 5\cancel{0}^{10}00 \\ - 4,678 \\ \hline 1,322 \end{array}$$

10 – 8 = 2 ones
90 – 70 = 2 tens
900 – 600 = 3 hundreds
5,000 – 4,000 = 1 thousand

Because 1,322 is close to the estimate 1,300, the difference is reasonable.

There are still 1,322 tickets available for the concert.

Talk About Math Ideas What number makes each of the statements on the right true? Explain.

1 thousand is ____ hundreds.
1 hundred is ____ tens.
1 ten is ____ ones.

64 Lesson 2-8

Copyright © Savvas Learning Company LLC. All Rights Reserved.

ELL English Language Learners Speaking

Give students time to solve the problem individually. Ask a volunteer to explain how he or she found the difference. Encourage students to use the correct terminology, such as *subtract* and *regroup*. If any students solved the problem differently, have them explain their process.

Emerging Ask pairs of students to find the value of $6,000 - 4,678$. Have students explain their process. Provide the sentence stem “I regrouped _____ thousands as _____ thousands, _____ hundreds, _____ tens, and _____ ones.”

Expanding Ask pairs of students to find the value of $6,000 - 4,678$. Have one student explain his or her process. If another student solved the problem differently, have him or her explain how the process was different.

Bridging Ask pairs of students to write problems with 4- or 5-digit numbers that require subtraction across zeros. Then have students trade problems, solve, and explain their processes.

ETP Visual Learning

Classroom Conversation

A Reason Abstractly Ask: How can you find the number of still available tickets for the concert? [Subtract the number of tickets sold from the total number of seats]

B Look for and Make Use of Structure Ask: After you regroup, how many thousands, hundreds, tens, and ones do you have? [5 thousands, 9 hundreds, 9 tens, 10 ones]

C Ask: How do you find the difference if you break the problem into 4 smaller problems? [Add the differences]

Prevent Misconceptions Watch for students who have trouble regrouping more than one place value. In Step 2, for example, some students may forget to change each 0 to 10 before regrouping it again to subtract the next place value.

MLR6 Three Reads

Ask: What information in the problem helped you know what operation to use? [“How many are still available?” shows that you have to find the difference between the total tickets and the number sold. Subtraction is used to find the difference.]

ETP Talk About Math Ideas

Have students engage in a think-pair-share to compare their thoughts about regrouping the place values. Listen for conversations about how each place value is regrouped to 10 of the place value to the right.

ETP Revisit the Essential Question

The same algorithm is used for subtracting with numbers that have zeros as for subtracting numbers without zeros. Although there is more than one way to regroup, the easier way may be the strategy that requires fewer regroupings.

Step 3 Practice and Problem Solving

15-20 min

Interactive Practice

Adaptive Practice

You may opt to have students complete automatically scored practice items online.

Name _____

Guided Practice

Do You Understand?

1. **Use Structure** Leesa used compensation to solve this problem: $(6,000 - 1) - (4,678 - 1) = 5,999 - 4,677 = 1,322$. How could you use Leesa's approach to subtract $4,999 - 1,475$?

$$5,000 - 1,476 = (5,000 - 1) - (1,476 - 1) = 4,999 - 1,475 = 3,524$$

2. One passenger flew 11,033 kilometers from Oslo to Lima. Another passenger flew 8,593 kilometers from Oslo to Los Angeles. How many more kilometers was the flight to Lima?

2,440 kilometers

Do You Know How?

For 3-8, subtract.

$$\begin{array}{r} 3. \quad 6,000 \\ - 1,773 \\ \hline 4,227 \end{array}$$

$$\begin{array}{r} 4. \quad 231,086 \\ - 172,863 \\ \hline 58,223 \end{array}$$

$$\begin{array}{r} 5. \quad 76,810 \\ - 22,645 \\ \hline 54,165 \end{array}$$

$$\begin{array}{r} 6. \quad 90,304 \\ - 51,137 \\ \hline 39,167 \end{array}$$

$$\begin{array}{r} 7. \quad 101,001 - 8,915 \\ \hline 92,086 \end{array}$$

$$\begin{array}{r} 8. \quad 9,050 - 3,461 \\ \hline 5,589 \end{array}$$

Practice and Problem Solving

For 9-23, subtract.

$$\begin{array}{r} 9. \quad 1,902 \\ - 1,374 \\ \hline 528 \end{array}$$

$$\begin{array}{r} 10. \quad 6,502 \\ - 5,380 \\ \hline 1,122 \end{array}$$

$$\begin{array}{r} 11. \quad 63,000 \\ - 48,673 \\ \hline 14,327 \end{array}$$

$$\begin{array}{r} 12. \quad 84,010 \\ - 3,992 \\ \hline 80,018 \end{array}$$

$$\begin{array}{r} 13. \quad 2,052 \\ - 1,039 \\ \hline 1,013 \end{array}$$

$$\begin{array}{r} 14. \quad 31,030 \\ - 27,426 \\ \hline 3,604 \end{array}$$

$$\begin{array}{r} 15. \quad 50,469 \\ - 22,917 \\ \hline 27,552 \end{array}$$

$$\begin{array}{r} 16. \quad 1,830 \\ - 644 \\ \hline 1,186 \end{array}$$

$$\begin{array}{r} 17. \quad 7,203 \\ - 847 \\ \hline 6,356 \end{array}$$

$$\begin{array}{r} 18. \quad 726,003 \\ - 282,942 \\ \hline 443,061 \end{array}$$

$$\begin{array}{r} 19. \quad 4,707 \\ - 2,016 \\ \hline 2,691 \end{array}$$

$$\begin{array}{r} 20. \quad 30,900 \\ - 22,855 \\ \hline 8,045 \end{array}$$

$$\begin{array}{r} 21. \quad 6,090 - 5,130 \\ \hline 960 \end{array}$$

$$\begin{array}{r} 22. \quad 11,246 - 9,489 \\ \hline 1,757 \end{array}$$

$$\begin{array}{r} 23. \quad 790,008 - 643,829 \\ \hline 146,179 \end{array}$$

Estimate to check if your answer is reasonable.



Copyright © Savvas Learning Company LLC. All Rights Reserved.

Lesson 2-8 65

24. **Construct Arguments** Will the difference between 44,041 and 43,876 be greater or less than 1,000? Explain.

Less than 1,000;

Sample answer:

$$43,876 + 1,000 > 44,041$$

25. **Vocabulary** Define *variable* and give an example of how a variable is used in an equation.

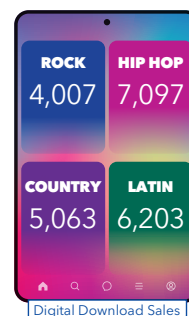
Sample answer: A variable is a letter that represents an unknown quantity in an equation. In the equation $5,283 + n = 10,566$, n is a variable.



26. How many more hip-hop than country downloads were sold?
2,034 more downloads

27. **Higher Order Thinking** How many more hip-hop and Latin downloads were sold than rock and country downloads? Explain.

4,230 more downloads; Sample answer: The total hip-hop and Latin downloads is $7,097 + 6,203 = 13,300$. The total rock and country downloads is $4,007 + 5,063 = 9,070$. The difference in the totals is $13,300 - 9,070 = 4,230$.



Digital Download Sales

Assessment Practice



28. Select all the correct differences.

- ☐ $5,000 - 1,856 = 3,244$
- ☒ $10,700 - 8,243 = 2,457$
- ☐ $64,002 - 43,178 = 20,934$
- ☒ $98,000 - 59,214 = 38,786$
- ☒ $600,482 - 428,531 = 171,951$

29. Find the difference.

$$\begin{array}{r} 60,000 \\ - 38,243 \\ \hline \end{array}$$

- ☐ A 17,355
- ☐ B 20,757
- ☒ C 21,757
- ☐ D 98,243

Copyright © Savvas Learning Company LLC. All Rights Reserved.

66 Lesson 2-8

Guided Practice

Formative Assessment

Error Intervention Item 4

If students try to regroup every place value of Item 4, then have them circle the greatest digit in each place-value column. Remind them that they only need to regroup if the greatest digit is the bottom number in the column.

Choose Efficient Strategies Remind students that for some problems such as finding the value of $101,001 - 8,915$, it may be necessary to regroup more than one column to be able to subtract.

Item 1 Look for and Make Use of Structure It may be helpful to have students review the Identity Property of Addition to better understand Leesa's use of compensation.

Practice and Problem Solving

ELL English Language Learners

Intentional math talk. Before the Practice and Problem Solving, review the terms *estimate* and *reasonable* with students. Point out these words in the character's speech bubble. Remind students that to estimate, we use numbers that are about the same to subtract. An answer is reasonable if it is close to the estimated answer. Model using estimation to solve a problem from the Guided Practice then discuss if the answer is reasonable.

ETP Quick Check

Formative Assessment

Check marks indicate items for prescribing differentiation. Items 18 and 28: 1 point each. Item 26: up to 3 points. The online Quick Check is auto scored and auto prescribes differentiation.

Step 4 Assess and Differentiate



15-30 min

Differentiation Library

- Additional Differentiation Library resources are described at the start of this topic.
- Differentiation resources that support diverse learning styles are online and in the Differentiation Library Teacher's Guide.

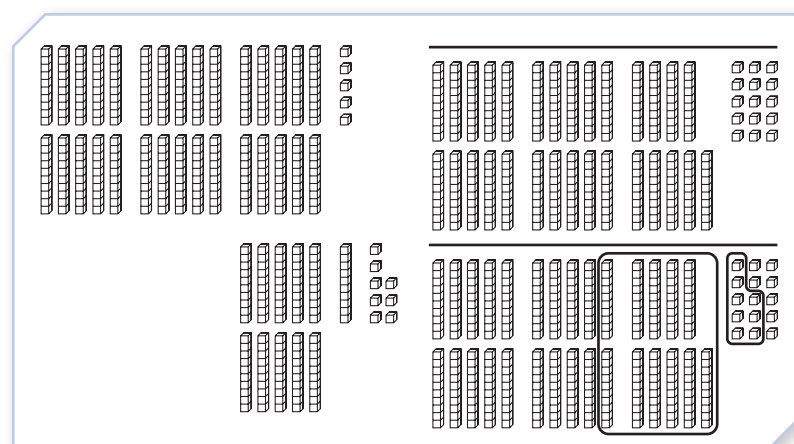
0-3 points: Intervention Activity or Reteach to Build Understanding Activity

4-5 points: Enrichment Activity

In addition, **English language learners** may benefit from the Build Mathematical Literacy Activity.

Intervention Activity

Materials Place-value blocks (or Teaching Tool 37), or have students draw blocks



- Display "305 - 118" on the board.
- Have students use place-value blocks, or draw blocks, to model both numbers.
- Guide students to regroup each number as tens rods and unit cubes.
- Since there is no whole-number answer for subtracting 8 ones from 5 ones, regroup 30 tens as 29 tens rods and 10 unit cubes.
- Model subtracting 8 from 15 and 11 tens from 29 tens with place-value blocks.
- Repeat the process using greater numbers.

Video Tutorial Available at Savvas Realize®

Students can access this video anytime to reinforce lesson content.

Another Look Video

Additional Practice

Printable or autoscored at Savvas Realize®

Name _____

Additional Practice

Subtract with Zeros

2-8

Another Look!

Find $700,402 - 297,354$.
Estimate: $700,000 - 300,000 = 400,000$

Step 1 Regroup

$$\begin{array}{r} 700,402 \\ - 297,354 \\ \hline \end{array}$$

4 hundreds = 3 hundreds + 10 tens
10 tens + 2 ones = 9 tens + 12 ones

Step 2 Subtract

$$\begin{array}{r} 700,402 \\ - 297,354 \\ \hline 048 \end{array}$$

$12 - 4 = 8$ ones
 $90 - 50 = 4$ tens
 $300 - 300 = 0$ hundreds

Step 3 Regroup

$$\begin{array}{r} 700,402 \\ - 297,354 \\ \hline 048 \end{array}$$

7 hundred thousands = 6 hundred thousands + 10 ten thousands
10 ten thousands = 9 ten thousands + 10 thousands

Step 4 Subtract

$$\begin{array}{r} 700,402 \\ - 297,354 \\ \hline 403,048 \end{array}$$

$10,000 - 7,000 = 3$ thousands
 $90,000 - 90,000 = 0$ ten thousands
 $600,000 - 200,000 = 4$ hundred thousands

The difference 403,048 is reasonable because it is close to the estimate of 400,000.

For **1-10**, subtract.

1. $61,070 - 4,981 = 56,089$

2. $5,000 - 2,058 = 2,942$

3. $815,950 - 423,147 = 392,803$

4. $90,800 - 37,638 = 53,162$

5. $102,604 - 6,174 = 96,430$

6. $22,700 - 20,487 = 2,213$

7. $40,000 - 29,526 = 10,474$

8. $600,470 - 307,299 = 293,171$

9. $8,106 - 2,999 = 5,107$

10. $214,507 - 83,569 = 130,938$

Copyright © Savvas Learning Company LLC. All Rights Reserved. Topic 2 | Lesson 2-8 25

11. Reasoning Fatima subtracts 9,405 from 11,000 and gets 3,595. Is Fatima's answer reasonable? Explain.
No; Sample answer: $11,000 - 9,405$ is about $11,000 - 9,000 = 2,000$. Because 3,595 isn't close to this estimate, it isn't reasonable.

13. There are 332,054 people in a city. 168,278 are under the age of eighteen. How many people are eighteen or older?
163,776 people in the city are eighteen or older.

12. A park district holds a fundraiser over 4 weekends in which teams swim laps for donations. The park district's goal is 40,000 laps. Over three weekends the teams swam 8,597 laps, 11,065 laps, and 9,211 laps. How many laps do they need to swim the fourth weekend to reach their goal?
11,127 laps

14. Higher Order Thinking Bruno subtracted 342,139 from 601,800. Is Bruno's answer correct? If not, explain why, and find the correct answer.
 $601,800 - 342,139 = 259,661$
Bruno's answer is incorrect because the hundred thousands were not regrouped correctly. The answer is 259,661.

15. Use Structure How much longer is the Amazon River than the Lower Tunguska and Ganges Rivers combined? Explain.
791 kilometers; Sample answer: $2,989 + 2,620 = 5,609$; $6,400 - 5,609 = 791$

World Rivers	
River	Length (kilometers)
Nile	6,650
Lower Tunguska	2,989
Senegal	1,641
Ganges	2,620
Amazon	6,400

Assessment Practice

16. Select all the correct differences.

☒ $7,000 - 4,238 = 2,762$

☐ $20,400 - 9,280 = 10,120$

☒ $72,004 - 28,376 = 43,628$

☒ $82,000 - 47,154 = 34,846$

☐ $500,098 - 275,329 = 225,769$

17. Find the difference.

$$\begin{array}{r} 9,000 \\ - 2,942 \\ \hline \end{array}$$

☒ A 6,058
☐ B 6,062
☐ C 6,158
☐ D 11,942

26 Topic 2 | Lesson 2-8

Copyright © Savvas Learning Company LLC. All Rights Reserved.

Lesson 2-8 **66A**