

ADDITION AND SUBTRACTION WITHIN 10,000

Across-Grades Progression

Looking Back	Looking Here	Looking Ahead
<p>Grade 2 Chapter 2</p> <p>Section 2C Add Without Renaming</p> <ul style="list-style-type: none"> Add Two 3-Digit Numbers Without Renaming Within 1,000 <p>Section 2D Add With Renaming</p> <ul style="list-style-type: none"> Add Two 3-Digit Numbers With Renaming in Tens and Ones <p>Section 2E Add Three or Four 2-Digit Numbers</p> <p>Grade 2 Chapter 3</p> <p>Section 3C Subtract Without Renaming</p> <ul style="list-style-type: none"> Subtract a 3-Digit Number Without Renaming Within 1,000 <p>Section 3D Subtract With Renaming</p> <ul style="list-style-type: none"> Subtract a 3-Digit Number With Renaming in Hundreds, Tens, and Ones <p>Grade 2 Chapter 4</p> <p>Section 4D Word Problems</p> <ul style="list-style-type: none"> Two-Part Word Problems: The Four Operations Two-Step Word Problems: Addition and Subtraction 	<p>Grade 3 Chapter 2</p> <p>Section 2A Addition and Subtraction Within 1,000</p> <ul style="list-style-type: none"> Add Fluently Within 1,000 Subtract Fluently Within 1,000 <p>Section 2B Addition and Subtraction Within 10,000</p> <ul style="list-style-type: none"> Addition Within 10,000 Without Renaming Addition Within 10,000 With Renaming Subtraction Within 10,000 Without Renaming Subtraction Within 10,000 With Renaming <p>Section 2C Other Addition and Subtraction Strategies</p> <ul style="list-style-type: none"> Add Using Number Lines Other Strategies to Add Subtract Using Number Lines Other Strategies to Subtract <p>Section 2D Word Problems</p>	<p>Grade 4 Chapter 2</p> <p>Section 2A Add Multi-Digit Whole Numbers</p> <p>Section 2B Subtract Multi-Digit Whole Numbers</p> <p>Section 2C Word Problems</p> <ul style="list-style-type: none"> One-Step Word Problems: Addition and Subtraction Two-Part Word Problems: Addition and Subtraction Two-Step Word Problems: Addition and Subtraction

Across- Chapters STEAM Project Work

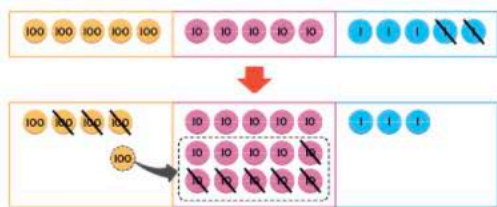
This project spans **Chapters 1 and 2**. Students are given an opportunity to make connections between engineering and mathematics as they investigate the five tallest buildings in the United States. This task requires students to apply their knowledge of rounding numbers to the nearest ten as well as comparing and ordering numbers to create a representation of the buildings. Students will work in pairs or small group to explore the height of each building in feet. Finally, students will design a building of their own and compare its height with the five tallest buildings in the United States. Invite each pair or group to share their building design with the class at the end of Chapter 2.

Chapter Overview

In this chapter, students' knowledge of adding and subtracting numbers to 1,000, with and without renaming, is extended to help them learn adding and subtracting numbers to 10,000. They will move from using base-ten materials to place-value chips to build their conceptual understanding of addition and subtraction with greater numbers.

Key Ideas

- Addition and subtraction problems can be solved using place value and the standard algorithm.



Subtract the ones.

$$\begin{array}{r} \text{H T O} \\ 555 \\ - 362 \\ \hline 3 \end{array}$$

Subtract the tens.

$$\begin{array}{r} \text{H T O} \\ \overset{A}{5} \overset{B}{5} 5 \\ - 362 \\ \hline 93 \end{array}$$

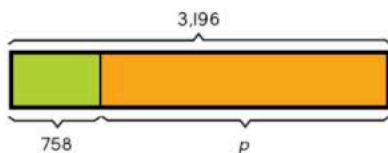
Subtract the hundreds.

$$\begin{array}{r} \text{H T O} \\ \overset{A}{5} \overset{B}{5} 5 \\ - 362 \\ \hline \overset{C}{1} 93 \end{array}$$

- Mental math can be used to add and subtract quickly.

$$\begin{aligned} 367 + 98 &= ? \\ 367 + 100 &= 467 \\ 467 - 2 &= 465 \\ 367 + 98 &= 465 \end{aligned}$$

- Word problems can be solved using models to show the part-whole relationship.



$$\begin{aligned} p &= 3,196 - 758 \\ &= 2,438 \end{aligned}$$

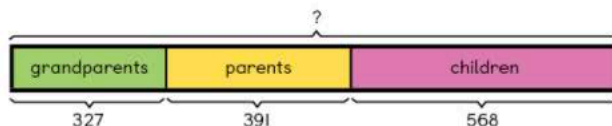
Concrete-Pictorial-Abstract Progression

Throughout the chapter, students will have multiple experiences working with concrete materials such as place-value chips. During the lessons when pictures of place-value chips are shown, students should be using place-value chips to physically represent the problem. The use of concrete materials provides hands-on opportunities for students to build and extend their understanding of addition and subtraction.



Place-value chips

Pictorial representations are also used to help students understand the concepts of addition and subtraction. For example, number lines and bar models help students visualize addition and subtraction.

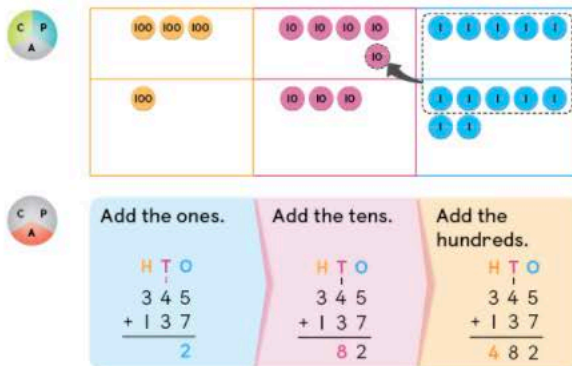


This bar model shows the number of people at a concert.

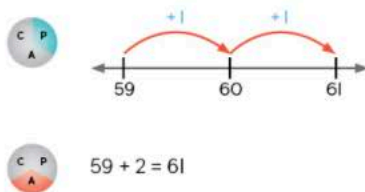
Abstract notation is connected to the concrete and pictorial in the examples above.

Chapter Progression

In **Sections 2A** and **2B**, students review concepts from Grade 2 by first finding the sum and difference of numbers up to 1,000 with and without renaming. Students then move to addition and subtraction of greater numbers up to 10,000. Students show the operation concretely using place-value charts and place-value chips. Students also record their understanding using the standard algorithm. Time is taken to address the idea of renaming numbers when having more than 10 units in a place value. For example, 12 ones can be renamed as 1 ten and 2 ones. Rounding numbers is used as a method to estimate the answer first.



In **Section 2C**, students develop fluency with addition and subtraction by using mental math and focusing on strategies. Students count on in ones, tens and hundreds using a number line to add up to two 3-digit numbers. Students also mentally add up to two 3-digit numbers using the “make a hundred” strategy. Students apply the same strategies to subtract up to two 3-digit numbers. They subtract mentally by counting back in ones, tens, and hundreds using number lines and by using the “make a hundred” strategy. These skills will help students build flexibility with numbers.



Lesson 3

2A Addition and Subtraction Within 1,000 (2)

Focus Question

How can I use estimation to check if the difference between two 3-digit numbers is reasonable?

I CAN

- I can subtract numbers within 1,000 fluently.
- I can check if the answers to subtraction problems are reasonable using estimation strategies.

Mathematical Practice(s)

- 2 Reason
- 6 Use Math Language

Material(s)

- 1 paper clip per pair
- 1 set of place-value chips per pair or small group
- 1 copy of Two Spinners (TRO6) per pair

SUBTRACT FLUENTLY WITHIN 1,000 (pages 43 to 46)



Lesson Opener

Task (page 43)

10 minutes

- Group students in pairs or small groups.
- Have students work on the task and provide them with place-value chips. Observe student discussions.
- After students have attempted the task, use the following prompts to facilitate a class discussion. Pay attention to the language students use.

What do you know about the problem? Farmer Leah picked 555 apples. She sold 362 of them. **What do you need to find?** number of apples she had left **How can you solve the problem?** subtract 362 from 555

Name: _____ Date: _____



Farmer Leah picked 555 apples. She sold 362 apples. How many apples did she have left?

Learn

Subtract to find the **difference** between 555 and 362.

Estimate the answer first.
555 is about 560.
362 is about 360.
 $560 - 360 = 200$
The answer is reasonable if it is close to 200.



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Lesson Development

Learn (pages 43 and 44)

10 minutes

- Write $555 - 362 = \underline{\quad}$ on the board. Write "difference" next to the blank.
- **We subtract to find the difference between 555 and 362.**
- Invite students to use rounding to estimate the answer to see whether the answer is reasonable.
- **What is 555 rounded to the nearest ten? 560 What is 362 rounded to the nearest ten? 360**
- Write $560 - 360 = \underline{\quad}$ on the board.
- **What is $560 - 360$? 200 So the answer is reasonable if it is close to 200.**

$$555 - 362 = ?$$



Subtract the ones.	Subtract the tens.	Subtract the hundreds.																																																						
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There are not enough tens to subtract from. Rename 1 hundred as 10 tens.



$$555 - 362 = \underline{193}$$

She had 193 apples left.

193 is close to 200. The answer is reasonable.



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continued

- Provide students with place-value chips.
- Allow students time to work together to solve the problem using place-value chips.
- **How did you take 362 from 555 using your place-value chips? What did you do first?** I subtracted 2 ones from 5 ones and had 3 ones left. Then I tried to subtract 6 tens from 5 tens but I did not have enough, so I renamed one of the hundreds into 10 tens. 10 tens plus the 5 tens I had made 15 tens. I took 6 tens from 15 tens and had 9 tens left. Then I took 3 hundreds from the remaining 4 hundreds and had 1 hundred left.
- **Why did you need to rename the hundreds and tens?** I renamed as there were not enough tens to subtract from.
- Write the vertical algorithm for $555 - 362$ on the board. Remind students that when finding the difference between two numbers we subtract ones from ones, tens from tens, and hundreds from hundreds, so it is important to align the digits.
- Continue modeling the algorithm on the board.
- **How many apples did Farmer Leah have left? 193 Does this answer make sense? How do you know?** 193 is close to 200 so the answer is reasonable.

Best Practice

As students explore the process of subtracting using place-value chips and writing the algorithm on the board, emphasize that the vertical notation is a record of what students have done with the place-value chips.

- As you model the algorithm, highlight the way we indicate renaming when subtracting. Write "rename" on the board and show students the notation for renaming the 5 hundreds and 5 tens as 4 hundreds and 15 tens.

Best Practice

Students may use "trade" or "exchange" to describe the physical process of using place-value chips to carry out the renaming. Encourage students to use the correct term "rename" when writing the vertical notation. Do not allow students to say things like "cross out the 5" or "put a 1 in front of the 5" as these do not support conceptual understanding.