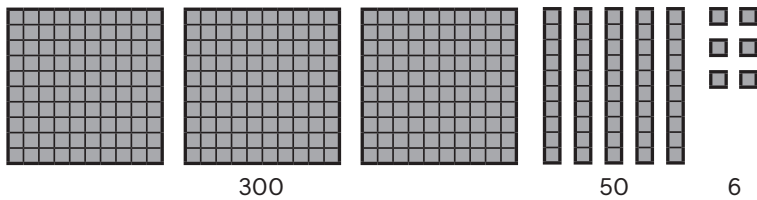# 1 NUMBERS TO 1,000

Chapter Overview

In this chapter, your student will build upon the understanding of numbers to 120 from first grade to deepen place-value concepts of numbers to 1,000. Your student will:

• use **base-ten sets** to count to 1,000.
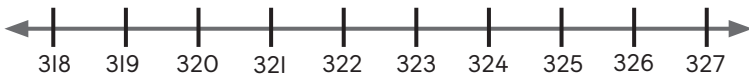

300   50   6

• use **place value** to determine the value of each digit in a number before finding 1 more, 1 less, 10 more, 10 less, 100 more, or 100 less than a number. He/she moves on to **compare and order numbers** using place value.

Hundreds	Tens	Ones
4	9	1
4	8	9

489 < 491

• use **number lines** to identify patterns and find missing numbers.

318 319 320 321 322 323 324 325 326 327

• learn to **identify bills and count** to find the value of a set of bills before **comparing and ordering** the amounts based on their values.

Set A	Set B

$106 = $106

Key Ideas

• We can represent numbers in various ways.
  The number in standard form is 356.
  The number in expanded form is 300 + 50 + 6.
  The number in word form is three hundred fifty-six.

• We can compare and order numbers based on their values.

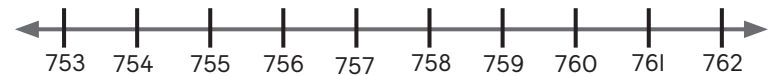| Hundreds	Tens	Ones
7	0	1
4	8	7
4	9	2

701 is the greatest.
487 is the least.

487   <   492   <   701
least   greatest

• We can identify the rule in a number pattern to find the missing numbers on a number line.

753 754 755 756 757 758 759 760 761 762

• We can count to find the total amount of money and exchange bills to make the same amount.
  10 ten-dollar bills can be exchanged for a $100 bill.
  10 one-dollar bills can be exchanged for a $10 bill.

Materials You Will Need

• 1 base-ten set
• 1 set of connecting cubes
• 1 number cube
• 1 set of paper money
• 1 set of place-value strips
• Place-Value Chart 1 (TR01)
• Hundred Chart (TR02)
• Place-Value Chart 2 (TR03)
• Number Cards (TR04)
• Number Tape Template (TR05)
• More/Less Cards (TR06)
• Number Line Template (TR07)

Chapter Opener (Student Book, page I)

Consider the picture and the questions on the page. Discuss them with your student. Prompt him/her to consider the information given in the picture and what is being asked. You may wish to ask the following questions:

🗩 **What do you notice about each phone?** *The phones have different prices. Some phones have prices that have hundreds. Others only have tens and ones.* **What do you notice about the prices of the phones? How would you determine the cheapest phone?** *Compare the prices of the phones using place value.* **What strategies would you use?** *I would use a base-ten set and a place-value chart to see which has more.* **Why do you compare prices?** *to find a better deal; to save money*

Teaching Tip

If your student is unsure about how to compare the prices of the phones, ask him/her to build each price using place-value materials. Invite him/her to compare each place and notice the value of each digit.

Recall (Student Book, pages 2 to 4)

Material(s)
- I base-ten set
- I number cube
- I set of place-value strips
- I copy of Place-Value Chart I (TR0I)
- I copy of Hundred Chart (TR02)

Before moving on to the problems on page 2 of the Student Book, have your student model similar tasks using concrete materials, such as a base-ten set and connecting cubes. Once you are convinced of his/her proficiency, move on to asking your student to create similar numbers using place-value strips and Place-Value Chart I (TR0I).

Make it a Game!

Encourage your student to roll a number cube twice to form a 2-digit number. Then have your student write the number in words. Next, encourage him/her to find I more, I less, I0 more, or I0 less than the number he/she has formed. Keep track of the numbers created and then have your student choose two numbers to compare.

🗩 **How will you represent your number with a base-ten set?** *Make the number of tens and ones.* **How do you know how many ones to use?** *I can show the number in the ones place.* **How does this number change when I more is added?** *It increases by I.* **How do you use place value to compare your numbers?** *Compare the place with the greatest value.*

After this review, your student should be able to complete the tasks on pages 2 to 4 of the Student Book independently.

- **QUESTION I** assesses your student's ability to count the base-ten set representing a 2-digit number, then write the number in tens and ones, and in standard form.
- **QUESTION 2** assesses your student's ability to write 2-digit numbers in their standard form or expanded form based on their understanding of place value.
- **QUESTION 3** assesses your student's ability to relate the word form of numbers to 120 to their standard form.
- **QUESTION 4** assesses your student's ability to write the word form for numbers to 120, given their standard form.
- **QUESTION 5** assesses your student's ability to compare numbers using the less than, equal to, or greater than symbol.
- **QUESTION 6** assesses your student's ability to identify a number between 50 and 70.
- **QUESTION 7** assesses your student's ability to order numbers from greatest to least.
- **QUESTION 8** assesses your student's ability to find I more, I less, I0 more, or I0 less than a number within I00.
- **QUESTION 9** assesses your student's ability to find the missing number in a number pattern.
- **QUESTION I0** assesses your student's ability to count the amount represented by a set of coins.

Teaching Tip

To extend the concept of numbers to 120, ask your student what he/she thinks about numbers greater than 120. Allow your student to use a base-ten set to skip count by Is and I0s beyond 120. Use different starting numbers so that your student gets a conceptual understanding of structure and patterns using the base-ten set.

Teaching Tip

When working to find I more, I less, I0 more, or I0 less than a number, provide your student with a copy of Hundred Chart (TR02). Encourage your student to count on using the chart, highlight the numbers, and observe the pattern.

Recall Answers (pages 2 to 4)

I. 9; 7; 97

2. **(a)** 72; 72
   (b) 60
   (c) 40

3. **(a)** 28
   (b) 35
   (c) 104

4. **(a)** forty
   (b) ninety-three
   (c) one hundred twelve

5. **(a)** <
   (b) =
   (c) >

6. Option C

7. 61; 48; 9

8. **(a)** 90
   (b) 88
   (c) 99
   (d) 79

9. Option C

10. Option B

1A Count to 1,000 (1)

Learning Outcome(s)
- Read and write numbers up to 1,000.

Vocabulary
- thousand
- expanded form
- standard form
- word form

Material(s)
- 1 base-ten set
- 1 number cube

Focus Question

💬 **What are some ways to count?**
Invite your student to ponder this question as you go through the lesson. Revisit this question when you reach the end of the lesson to check his/her understanding.

COUNT TO 1,000 (Student Book, pages 5 to 10)

Lesson Opener
Task (Student Book, page 5)

Show your student the **Lesson Opener** and cover the rest of the page. Discuss the question with your student. Do not show your student how to do the task and allow him/her to explore the concept of counting using a base-ten set and counting strategies.

Refer your student to **Learn** and **Learn Together** in the Student Book for reflection after your student has explored the concepts. Use questions to build understanding and direct instruction to refine understanding.

Teaching Tip

The goal of this lesson is to encourage regularity with counting. Encourage your student to count from the greatest place first. 324 would be counted as 100, 200, 300, 310, 320, 321, 322, 323, 324.

Lesson Development
Learn (Student Book, page 5)

Look at the picture of the scouts together with your student. Have your student notice how the scouts are organized. You may wish to ask these questions:

💬 **What do you notice about the way the scouts are organized?** *10 rows of 10.* **How does this organization help you count the number of scouts?** *I can count by 10s.* **Why might you want to count by 10s instead of 1s?** *It is faster and I will less likely make errors.*

Show your student how to use a base-ten set to count by 10s to 100. Point out that 10 tens make 1 hundred.

Learn Answers (Student Book, page 5)

100; 100

1D Number Lines

Learning Outcome(s)
- Find the missing number within 1,000 given its position on a number line.
- Find the position of a number within 1,000 on a number line.

Vocabulary
- number line

Material(s)
- 1 base-ten set
- 1 copy of Number Line Template (TR07)

NUMBER LINES (Student Book, pages 31 to 34)

Lesson Opener
Task (Student Book, page 31)

Show your student the **Lesson Opener** and cover the rest of the page. Discuss the question with your student. Do not show your student how to do the task and allow him/her to explore and discover the concept of number lines using a ruler as an example.

Refer your student to **Learn** and **Learn Together** in the Student Book for reflection after your student has explored the concepts. Use questions to build understanding and direct instruction to refine understanding.

Lesson Development
Learn (Student Book, page 31)

Look at the picture of the ruler and ask your student to find the missing numbers. Encourage your student to count and notice the pattern. You may wish to ask these questions:

🗨 **What do you notice about the ruler?** *It is missing some numbers.* **What pattern do you see?** *The numbers increase by 1 each time.* **How can you use the pattern to find the missing number?** *Count on by 1s from the previous number.*

Invite your student how to count by 1s to find the missing numbers in the number line. Encourage your student to use the ones place to count and provide base-ten sets as necessary.

Show your student the number line in the Student Book. Tell him/her that each mark on the number line tells the position of a number.

😊😊 Invite your student to study the thermometer and determine the missing numbers by identifying the pattern.

🗨 **How is the thermometer similar to the number line?** *The numbers increase by 1 each time.* **How is it different?** *It begins at 35 instead of 0.*

🗨 **How can you find missing numbers on a number line?**
Invite your student to ponder this question as you go through the lesson. Revisit this question when you reach the end of the lesson to check his/her understanding.

Teaching Tip

Use a real ruler to show your student a real-world example of a number line. Note the way the numbers increase as they move to the right and the pattern of increasing by 1. You may wish to ask these questions:

🗨 **What do you notice about the numbers on the ruler?** *They increase by 1. The numbers increase to the right and decrease to the left.* **Where do the numbers start?** *0* **What other examples of a number line are there?** *thermometer, measuring tape*

Learn Answers
(Student Book, page 31)

8; 9; 12

Learn Together (Student Book, page 32)

Provide your student with Number Line Template (TR07) and ask him/her to generate similar number lines as those in the Student Book based on the pattern and the starting or ending number.

Through questioning, lead your student to understand how to find the missing numbers and the position of a number on the number lined in **Learn Together**. As you go through the problems with your student, you may wish to ask the following questions:

🗨 **What do you notice about the number line?** *It is missing some numbers.* **What patterns do you see?** *The numbers increase by I each time.* **How is this similar to counting with a base-ten set?** *It is the same as adding a one to the number.*

After your student has explored the concepts in the **Lesson Opener, Learn**, and **Learn Together**, you may wish to ask these questions to encourage further reflection:

🗨 **How does your thinking compare to the book? Do you see anything in the book that helps you understand about finding missing numbers on a number line better? Is there anything in the book that helps you identify the position of a number on a number line easily? What is the same? What is different?**

You may wish to have your student summarize his/her learning in a math journal. Have your student give a real-life example of when number lines might be used.

- **QUESTION I** builds your student's understanding of finding missing numbers on the number lines.
- **QUESTION 2** builds your student's understanding of using number lines and benchmark numbers to identify the position of a number.

😊😊 Invite your student to observe the way the numbers on the number lines are arranged.

🗨 **What do you notice about the starting number on the number lines?** *They are all different.* **How are the numbers arranged?** *The numbers increase as they move to the right; the numbers that are less are on the left.* **How can you tell what number is missing?** *I can count on by Is.*

Lesson Debrief

- Conclude the lesson and facilitate your student's reflection by asking him/her to answer the **Focus Question** and share his/her thinking.
- Extend the discussion by posing the following questions.
    🗨 **How are numbers arranged on a number line?** *From left to right, they are written from least to greatest.* **How could you use that to find missing numbers on the number line?** *I could count on by Is.*

Learn Together Answers

(Student Book, page 32)

I. **(a)** 27; 29; 32
    (b) 320; 323; 324

2.

Teaching Tip

When your student is working with Number Line Template (TR07), ask your student to write the numbers under the marks along the number line to identify the position of a number. Encourage him/her to keep counting each time.

Reflect and Connect

- Allow time for your student to reflect on what he/she has learned and ask questions about what he/she may be unsure of.
- Encourage him/her to share anything that was confusing or difficult, and how thinking about it differently and perseverance helped the process of learning.
- Ask your student to answer a reflection question or draw a picture to show his/her reflection. You may offer these prompts:
  - 💬 **What is a number line? How did a number line help you identify a counting pattern? How did the pattern help you find missing numbers?**

What to look for:
- a definition of a number line and its components
- an understanding of how a number line uses a counting pattern
- an example of using the counting pattern to find the missing numbers

Practice On Your Own (Student Book, pages 32 and 33)

- **QUESTION 1** assesses your student's ability to find missing numbers on the number lines.
- **QUESTION 2** assesses your student's ability to locate the position of numbers on the number lines, given some benchmark numbers.

Think!

- **QUESTION 3** assesses your student's ability to use a number line to compare and order numbers and explain his/her thinking. You may wish to ask the following questions:
  - 💬 **How is this like the Lesson Opener?** *There are numbers missing on the number line.* **How can you use the number at the end of the number line to help you?** *Count back by 1s.* **How do you determine where the greatest number should go?** *In a number line, the greatest number goes to last marking on the right.*

Teaching Tip

Invite your student to consider how number lines are similar to number patterns by counting on or back by 1s.
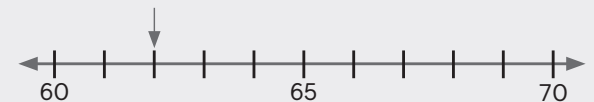- 💬 **How is a number line like a pattern?** *Each number increases by 1.* **How do each of the number lines in this lesson differ?** *They start at a different number. They have different numbers represented.*
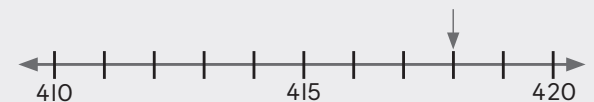
Practice On Your Own Answers
(Student Book, pages 32 and 33)

1. **(a)** 755; 756; 760; 762
   (b) 91; 93; 97; 99
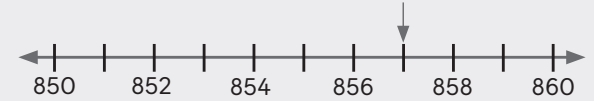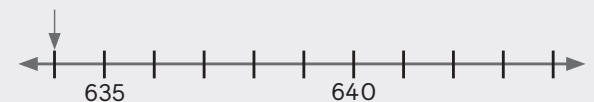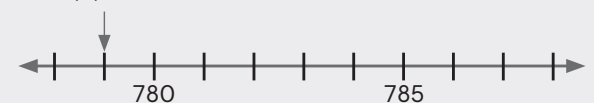   **(c)** 576; 579; 581; 583
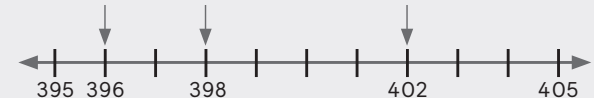
2. **(a)**

(b)

(c)

(d)

(e)

Think! Answer

3.

Explanations vary. Example:
396 is to the left of 398 and 402.
396 is the least number.
402 is to the right of 396 and 398.
402 is the greatest number.

396 < 398 < 402
least   greatest

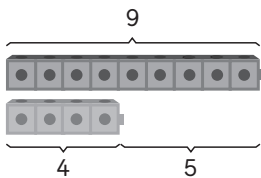# 4 ADDITION AND SUBTRACTION USING BAR MODELS

Chapter Overview

In this chapter, your student's knowledge of addition and subtraction within 1,000 using different strategies from previous chapters will be extended to solve up to two-step word problems using bar models. Your student will:

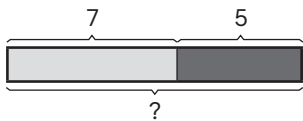- use the term **sum** to show the addition of two parts to make a whole.
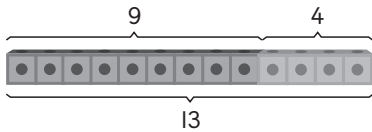
$$9 + 4 = 13$$

- use the term **difference** to show subtraction as a comparison of two numbers or subtracting a part from the whole.
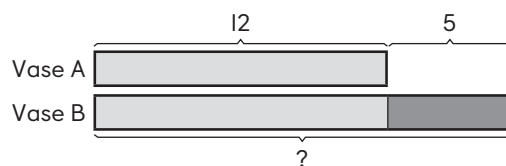
$$9 - 4 = 5$$

- use a **part–whole model** to demonstrate addition and subtraction operations within a one- or two-step word problem and use the matching equation.
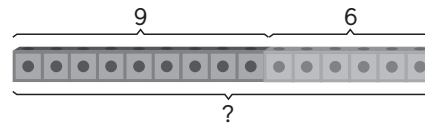
$$7 + 5 = 12$$

- use a **comparison model** to compare quantities in a one- or two-step word problem and determine which operation and equation should be used to solve.
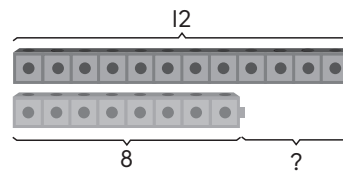
$$12 + 5 = 17$$

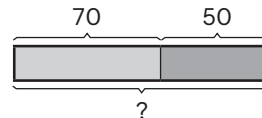## Key Ideas

- We can find the sum of two numbers.

$$9 + 6 = 15$$

- We can find the difference between two numbers.

$$12 - 8 = 4$$

- We can apply the three-step problem-solving method and use part–whole bar models to visualize one- and two-step addition and/or subtraction word problems.

- We can apply the three-step problem-solving method and use comparison models to visualize a comparison relationship between two numbers in a one- or two-step word problem.
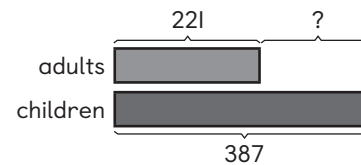
Materials You Will Need

- 1 base-ten set
- 1 set of connecting cubes (two colors)
- Paper Strips (TR17)

Chapter Opener (Student Book, page 167)

Consider the picture and the questions on the page. Discuss them with your student. Prompt him/her to think of the times he/she visited a swimming pool. You may wish to ask the following questions:

🗨 **What do you see in the picture?** *19 children are in the pool and 1 adult is standing beside the pool. Some children are wearing goggles.* **What types of stories could you tell about the picture?** *Addition and subtraction stories.* **How would you use this understanding to write a word problem based on the information in the bottom of the picture?** *I could add the 128 children and 72 adults to find the number of people who visited the pool that day; I could subtract to find how many more children visited the pool.* **Look at the numbers in the problem. Do you think you should use connecting cubes to solve the problem? Why or why not?** *No, the numbers are too large. I will need too many cubes.*

> ### Teaching Tip
>
> Your student has just completed Chapters 2 and 3 that focused heavily on computation with the addition and subtraction of numbers within 1,000. Use **Recall** on page 168 of the Student Book to review the concepts using a base-ten set and place value charts, if needed. Encourage your student to add or subtract using the base-ten set and vertical algorithm. Each time, have your student explain each step using place-value language.
>
> As your student moves to the word problems in **Recall**, use the base-ten set to act the stories out. Show the operation of addition in the button problem as the buttons are placed together in a bowl. Show the operation of subtraction in the flower problem by giving some of the base-ten set away. Reinforce the idea of addition and subtraction as a physical action to help your student comprehend what is happening in the word problem.

> ### Teaching Tip
>
> Throughout the chapter, your student will need to read each word problem. If decoding and comprehension are a challenge, read through each word problem several times to help your student comprehend the story. Read it without the numbers on the first read through. Ask your student to act it out and show what is happening with a picture before trying to solve.

Recall (Student Book, page 168)

Material(s)
- 1 base-ten set
- 1 set of connecting cubes (two colors)

Before moving on to the problems on page 168 of the Student Book, have your student model similar tasks using concrete materials, such as a base-ten set or connecting cubes. Once you are convinced of his/her proficiency, move on to asking your student to write down his/her thinking using equations.

4B Part-Whole Model (1)

Learning Objective(s)
- Solve one-step word problems involving addition by drawing part-whole models.

Vocabulary
- bar model

Material(s)
- 1 set of connecting cubes (two colors)
- 1 copy of Paper Strips (TR17)

Lesson Opener
Task (Student Book, page 173)

Show your student the **Lesson Opener** and cover the rest of the page. Discuss the question with your student. Do not show your student how to do the task and allow him/her to explore the concept of addition in part-whole models using connecting cubes.

Refer your student to **Learn** and **Learn Together** in the Student Book for reflection after your student has explored the concepts. Use questions to build understanding and direct instruction to refine understanding.

Lesson Development
Learn (Student Book, page 173)

Ask your student to look at the picture on page 173 of the Student Book. Have your student consider the parts represented in the story and encourage him/her to show them using connecting cubes. Invite your student to draw a model similar to his/her connecting cube model. Point out that it can be time consuming to draw each connecting cube and that a rectangle for each part can be drawn instead. Draw and label each part of the model. Use a question mark to show the unknown whole. You may wish to ask these questions:

💬 **What do you notice in the picture?** *7 students are sitting at the table. 5 children are standing.* **How many students are there in all?** *12* **How is your drawing similar to the connecting cube model?** *They both have 7 and 5 and show two parts.* **How is your drawing different from the connecting cube model?** *The connecting cube model shows each student. The drawing has rectangles that represent all the students sitting or standing.*

Show your student how to label the parts of the rectangle. Point out that he/she has drawn a part-whole model. Tell him/her that drawing a bar model is useful for working with greater numbers.

💬 **How does drawing a part-whole model help you to solve a word problem involving addition?**
Invite your student to ponder this question as you go through the lesson. Revisit this question when you reach the end of the lesson to check his/her understanding.

Learn Answers (Student Book, page 173)

12; 12

Teaching Tip

Use colored pencils that match the colors of the connecting cubes when drawing part-whole models. This will help your student make connections to his/her concrete models.

Learn Together (Student Book, pages 174 and 175)

Provide your student with Paper Strips (TRI7). Encourage your student to represent each addition situation using the paper strips by building a part–whole model. Have your student label each part and show why the operation is addition.

Through questioning, lead your student to draw the bar models in **Learn Together** and write the addition equations. As you go through the problems with your student, you may wish to ask the following questions:

🗨 **Where do you see the parts represented?** *each rectangle of the model* **Where do you see the whole represented?** *The entire bar model, or both the parts placed together.* **How do you know this is addition?** *The combining of parts means addition.*

After your student has explored the concepts in the **Lesson Opener**, **Learn**, and **Learn Together**, you may wish to ask these questions to encourage further reflection:

🗨 **How does your thinking compare to the book? Do you see anything in the book that helps you understand part-whole models better? What is the same? What is different?**

You may wish to have your student summarize his/her learning in a math journal. Encourage your student use Paper Strips (TRI7) to represent an addition story. Have your student identify the parts and whole in the story and add to find the total for these questions.

- **QUESTIONS 1** and **2** build your student's understanding of using part-whole models to solve one-step addition problems.
- **QUESTION 3** builds your student's understanding of producing a part-whole model to solve a one-step addition problem.

Digging Deeper

Invite students to draw a part-whole model and explain where the parts and whole are shown on the model.

🗨 **What is a bar model?** *It is a model that I can draw to represent a problem to help me see the relation between numbers.* **How can you describe what a part-whole model is made up of?** *A rectangle is drawn for the whole. It is divided to show each part of the whole.*
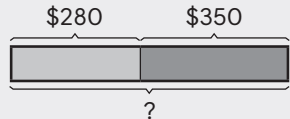

Lesson Debrief

- Conclude the lesson and facilitate your student's reflection by asking him/her to answer the **Focus Question** and share his/her thinking.
- Extend the discussion by posing the following questions.
  - 🗨 **How do you find the sum in a word problem using a part–whole model?** *I add the two parts to find the whole.* **Is it possible to represent part–whole models using connecting cubes? Why or why not?** *Yes, because I can build each part using the connecting cubes and put them together to add.*

Learn Together Answers
(Student Book, pages 174 and 175)

1. 50
   70 + 50 = 120
   There are <u>120</u> pennies in all.

2. 33; 42
   33 + 42 = 75
   Adam had <u>75</u>¢ at first.

3.

   280 + 350 = 630
   He saved $<u>630</u> in the two months.

For Additional Support

The numbers in the practice questions are too large to represent using connecting cubes. This is so that your student can use bar models as pictorial representations. If needed, substitute the numbers in the problems with numbers less than 20 for students to model using the cubes and then relate it to the greater numbers.

- Allow time for your student to reflect on what he/she has learned and ask questions about what he/she may be unsure of.
- Encourage him/her to share anything that was confusing or difficult, and how thinking about it differently and perseverance helped the process of learning.
- Ask your student to answer a reflection question or draw a picture to show his/her reflection. You may offer these prompts:
  - 💬 **What does it mean to draw a bar model? What do part–whole models look like? How do they help you solve addition word problems?**

What to look for:
- a definition of a bar model as a pictorial representation for something done concretely
- an example of a part–whole model for an addition situation
- an understanding of how the part–whole model relates to an addition equation

Practice On Your Own (Student Book, pages 175 and 176)

- **QUESTION 1** assesses your student's ability to use the given part-whole model to solve the addition problem.
- **QUESTIONS 2** and **3** assess your student's ability to draw part-whole models and write equations to solve the addition problems.

More Resources

- Refer to **Do More at Home** below and **Reteach 2, Exercise 4B (1)** if your student needs additional support.
- When your student is ready, have him/her work on **Additional Practice 2A, Exercise 4B (1)**.
- To provide your student with a challenge, have him/her work on **Extension 2, Exercise 4B (1)**.

Do More at Home

Ask your student to look around his/her daily life to find real-life examples of addition problems that can be solved with a part-whole model. Invite your student to model a real-life situation using Paper Strips (TR17) and draw the part-whole model in his/her math journals. Remind your student to use the addition strategies learned in Chapter 2 to solve.
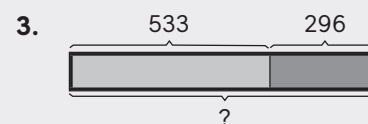
Practice On Your Own Answers

(Student Book, pages 175 and 176)

1. $65 + 32 = 97$
   <u>97</u> oranges were in the crate in the end.

2.
254	319

   ?
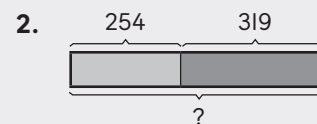
   $254 + 319 = 573$
   The restaurant sells <u>573</u> slices of pie over the two days.

3.
533	296

   ?

   $533 + 296 = 829$
   There were <u>829</u> building blocks in the bag at first.