Core Knowledge® MATHEMATICS

Putting It All Together

Putting It All Together

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Putting It All Together
Teacher Guide
Core Knowledge Mathematics™

Unit 9: Putting It All Together

At a Glance

Unit 9 is estimated to be completed in 15 days.

This unit is divided into three sections including 13 lessons.

- Section A—Fluency Within 20 and Measurement (Lessons 1-4)
- Section B—Numbers to 1,000 (Lessons 5-8)
- Section C—Create and Solve Story Problems (Lessons 9-13)

On pages 5-6 of this Teacher Guide is a chart that identifies the section each lesson belongs in and the materials needed for each lesson.

This unit uses two student centers.

- Five in a Row; Addition and Subtraction
- Target Numbers

Unit 9: Putting It All Together

Unit Learning Goals

- Students consolidate and solidify their understanding of various concepts and skills related to major work of the grade. They also continue to work toward fluency goals of the grade.

In this unit, students revisit major work and fluency goals of the grade, applying their learning from the year.

Section A gives students a chance to solidify their fluency with addition and subtraction within 20. In section B, students apply methods they used with smaller numbers to add and subtract numbers within 100. They also revisit numbers within 1,000: composing and decomposing three-digit numbers in different ways, and using methods based on place value to find their sums and differences.

In the final section, students interpret, solve, and write story problems involving numbers within 100, which further develop their fluency with addition and subtraction of two-digit numbers. They work with all problem types with the unknown in all positions.

Clare picked 51 apples. Lin picked 18 apples. Andre picked 19 apples.
Here is the work a student shows to answer to a question about the apples.
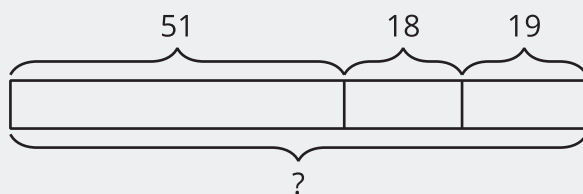
$$51 + 19 = 70$$
$$70 + 18 = 88$$

What is the question?

The sections in this unit are standalone sections, not required to be completed in order. The goal is to offer ample opportunities for students to integrate the knowledge they have gained and to practice skills related to the expected fluencies of the grade.

Section A: Fluency Within 20 and Measurement

Standards Alignments

Addressing   2.MD.A.1, 2.MD.A.4, 2.MD.B.5, 2.MD.D, 2.MD.D.9, 2.NBT.B.5, 2.OA.B.2
Building Towards   2.MD.A

Section Learning Goals

- Fluently add and subtract within 20.

In this section, students practice adding and subtracting within 20 to meet the fluency expectations of the grade, which include finding all sums and differences within 20, and knowing from memory all sums of 2 one-digit numbers.

Students begin with exercises and games that emphasize using the relationship between addition and subtraction to find the value of expressions and unknown addends. When students encounter sums and differences they don't know right away, they use mental math strategies and other methods they have learned, such as using facts they know, making equivalent expressions, and composing or decomposing a number to make a 10.

Later in the section, students apply their mental strategies to find sums and differences within 20 in a measurement context. They measure standard lengths and create line plots, and then use the measurements to add and subtract.

Use the pencil measurements to create a line plot.

group	length of pencils in cm				total length
A	8	13	12	7	
B	9	15	7	10	
C	12	13	8	6	
D	9	9	11	13	
E					
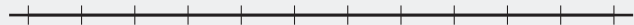
👤↔👤 PLC: Lesson 3, Activity 1, Measure on the Map

Section B: Numbers to 1,000

Standards Alignments

Addressing   2.NBT.A, 2.NBT.A.1, 2.NBT.A.3, 2.NBT.B.5, 2.NBT.B.7

Section Learning Goals

- Add and subtract within 1,000 using strategies based on place value and the properties of operations.
- Fluently add and subtract within 100.

In this section, students revisit numbers within 1,000 and develop their facility with addition and subtraction within 100. The work here requires students to compose and decompose multiple place-value units, which reinforces their understanding of place value and operations on larger numbers.

Students begin by decomposing and composing three-digit numbers in multiple ways using base-ten blocks, base-ten diagrams, words, and symbols. They also compose and decompose units as they match and create equivalent expressions for three-digit numbers.

Find the number that makes each equation true.

6 hundreds + 9 ones = 5 hundreds + _____ tens + 9 ones
2 hundreds + 9 tens + 17 ones = _____ hundreds + 7 ones

Next, students practice addition and subtraction within 1,000. They analyze sums and differences and reason about which ones are more difficult to evaluate and which are easier, deepening their understanding of composition and decomposition based on place value.

Students then work toward fluent addition and subtraction within 100, which requires composing or decomposing one unit when using methods based on place value. Methods for finding sums and differences mentally, without explicitly composing or decomposing units, are also encouraged.

👤↔👤 PLC: Lesson 5, Activity 2, Let Me Count the Ways

Section C: Create and Solve Story Problems

Standards Alignments

Addressing   2.NBT.A, 2.NBT.B.5, 2.NBT.B.9, 2.OA.A.1

Section Learning Goals

- Represent and solve one- and two-step story problems within 100.

In this section, students create and solve one- and two-step story problems with unknown values in all positions. They discuss how they make sense of the problem and share their methods for solving.

By now, students are expected to solve all types of story problems within 100, using methods and representations that make sense to them. They continue to make connections across representations, with a focus on equations and tape diagrams, which will be used frequently in grade 3.

Students analyze stories and determine the types of questions that could be asked based on the provided information. Then, they write their own story problems based on images and their own experiences.

Write and solve a story problem the diagram could represent.
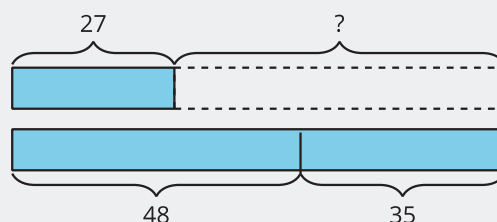
👤 ↔ 👤 PLC: Lesson 10, Activity 2, What is the Question?

Throughout the Unit

Here is a sampling of warm-ups in the unit that provide an invitation for students to think about the topics addressed within each section: fluency within 20, numbers to 1,000, and story problems.

lesson 1	lesson 5	lesson 10
Number Talk $10 - 5$ $11 - 5$ $12 - 6$ $13 - 6$	What Do You Know About ____? What do you know about 308?	Notice and Wonder In the park, there are 37 kids on the soccer field, 18 kids on the tennis courts, and 25 kids at the picnic tables. What do you notice? What do you wonder?

Materials Needed

LESSON	GATHER	COPY
A.1	• Paper clips	• Spin and Find the Missing Number Spinners (groups of 2)
A.2	• Materials from a previous activity	• Number Cards 0-19 (groups of 2) • Number Mix Up (groups of 1)
A.3	• Rulers (centimeters)	• Measurement Map (groups of 1)
A.4	• Pencils • Rulers (centimeters)	• none
B.5	• Base-ten blocks • Tools for creating a visual display	• none
B.6	• Base-ten blocks	• Match Expressions Cards 2.9 (groups of 2)
B.7	• none	• none
B.8	• Materials from a previous activity • Materials from previous centers	• Heads Up - Add and Subtract within 100 Number Cards (groups of 2)
C.9	• none	• Card Sort Story Problems (groups of 1)
C.10	• none	• none
C.11	• none	• Represent Story Problem Cards (groups of 2)
C.12	• Connecting cubes • Materials from a previous lesson	• Story Photos (groups of 2)

C.13	• Chart paper	• none
	• Colored pencils, crayons, or markers	
	• Sticky notes	

Center: Five in a Row: Addition and Subtraction (1–2)

Stage 6: Add within 100 with Composing

Activities

- Grade2.9.B8.2 (addressing)

Stage Narrative

Partner A chooses two numbers and places a paper clip on each number. They add the numbers and place a counter on the sum. Partner B moves one of the paper clips to a different number, adds the numbers, and places a counter on the sum. Students take turns moving one paper clip, finding the sum, and covering it with a counter.

Standards Alignments

Addressing   1.NBT.C.4, 2.NBT.B.5

Materials to Gather

Paper clips, Two-color counters

Materials to Copy

Five in a Row Addition and Subtraction Stage 6 Gameboard (groups of 2)

Additional Information

Each group of 2 needs 25 counters and 2 paper clips.

Stages used in Grade 1

Stage 1

Addressing

- Grade1.1.A
- Grade1.1.B
- Grade1.1.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 2

Addressing

- Grade1.1.A
- Grade1.1.B
- Grade1.1.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 3

Addressing

- Grade1.3.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 4

Addressing

- Grade1.4.A
- Grade1.4.B

Supporting

- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 5

Addressing

- Grade1.5.A
- Grade1.5.B
- Grade1.5.C

Supporting

- Grade1.6.A
- Grade1.6.B

Stage 6

Addressing

- Grade1.5.C

Supporting

- Grade1.6.A
- Grade1.6.B

Center: Target Numbers (1–5)

Stage 3: Add Two-digit Numbers

Activities

- Grade2.9.B8.2 (addressing)

Stage Narrative

Students add two-digit numbers to get as close to 95 as possible. Students start by rolling two number cubes to get a starting number. Then, they take turns rolling the three cubes to get a number to add. They choose one of the numbers on the cubes to represent the tens and a different number to represent the ones. Students add their tens and ones to the starting number. The sum becomes the first addend in the next round. The player who gets closest to 95 in 6 rounds, without going over, is the winner.

Standards Alignments

Addressing   1.NBT.C.4

Materials to Gather	**Materials to Copy**
Connecting cubes in towers of 10 and singles, Number cubes	Target Numbers Stage 3 Recording Sheet (groups of 1)

Additional Information

Each group of 2 needs three number cubes.

Stage 4: Subtract Tens or Ones

Activities

- Grade2.9.B8.2 (addressing)

Stage Narrative

Before playing, students remove the cards that show 0 and 10 and set them aside.
Students subtract tens or ones to get as close to 0 as possible. Students start their first equation with 100 and then take turns flipping a number card and choosing whether to subtract that number of tens or ones and write an equation. The difference becomes the first number in the next equation. The player who gets closest to 0 in 6 rounds, without going below 0, is the winner.

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.8

Materials to Gather

Base-ten blocks, Number cards 0–10

Materials to Copy

Target Numbers Stage 4 Recording Sheet (groups of 1)

Stage 5: Subtract Two-digit Numbers

Activities

- Grade2.9.B8.2 (addressing)

Stage Narrative

Students subtract two-digit numbers to get as close to 0 as possible. Students start their first equation with 100. Then, they take turns rolling the three cubes to get a number to subtract. They choose one of the numbers on the cubes to represent the tens and the other number to represent the ones. Students subtract their tens and ones from the starting number. The difference becomes the first number in the next equation. The player who gets closest to 0 in 6 rounds, without going below 0, is the winner.

Standards Alignments

Addressing   2.NBT.B.5

Materials to Gather

Base-ten blocks, Number cubes

Materials to Copy

Target Numbers Stage 5 Recording Sheet (groups of 1)

Additional Information

Each group of 2 needs 3 number cubes.

Stages used in Grade 1

Stage 1

Addressing

- Grade1.5.B

Supporting

- Grade1.5.C
- Grade1.6.A
- Grade1.6.B
- Grade1.7.B
- Grade1.7.C

Stage 2

Addressing

- Grade1.5.B

Supporting

- Grade1.5.C
- Grade1.6.A
- Grade1.6.B
- Grade1.7.B
- Grade1.7.C

Stage 3

Addressing

- Grade1.5.C

Supporting

- Grade1.6.A
- Grade1.6.B
- Grade1.7.B
- Grade1.7.C

Section A: Fluency Within 20 and Measurement

Lesson 1: Sums and Differences Within 20

Standards Alignments

Addressing   2.OA.B.2

Teacher-facing Learning Goals	**Student-facing Learning Goals**
• Fluently add and subtract within 20.	• Let's find the value of sums and differences mentally.

Lesson Purpose

The purpose of this lesson is for students to fluently add and subtract within 20 using mental strategies.

In this lesson, students find the value of sums and unknown addends from memory in expressions with values within 20. In the first activity, students complete an inventory of sums within 20 and identify those sums that they do not know yet from memory. In the second activity, they continue to practice fluency with addition and subtraction within 20. Throughout the lesson, encourage students to share the methods they use to recall or find a sum or difference fluently, including methods based on using the relationship between addition and subtraction, decomposing to get to a ten, and creating expressions that are equivalent, but easier to find mentally.

Access for:

ⓩ Students with Disabilities

• Action and Expression (Activity 2)

Instructional Routines

MLR8 Discussion Supports (Activity 2), Number Talk (Warm-up)

Materials to Gather	**Materials to Copy**
• Paper clips: Activity 2	• Spin and Find the Missing Number Spinners (groups of 2): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Which sums within 20 did students show they are still working on? How can you make time for practice with these sums during the school day?

Cool-down (to be completed at the end of the lesson)   🕐   5 min

Add and Subtract with Fluency

Standards Alignments

Addressing   2.OA.B.2

Student-facing Task Statement

Find the value of each expression.

1. $11 - 5$
2. $12 - 3$
3. $16 - 8$
4. $9 + 3$
5. $8 + 8$
6. $13 - 8$

Student Responses

1. 6
2. 9
3. 8
4. 12
5. 16
6. 5

------------------------------ **Begin Lesson** ------------------------------

Warm-up

🕐 10 min

Number Talk: Subtract Within 20

Standards Alignments

Addressing   2.OA.B.2

This Number Talk encourages students to think about how they may use known sums and differences to find the value of other sums and differences. This understanding will be helpful as students continue building fluency with addition and subtraction within 20.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $10 - 5$
- $11 - 5$
- $12 - 6$
- $13 - 6$

Student Responses

- $5: 5 + 5 = 10$
- $6: 5 + 5 = 10$, add one more to get to 11.
- $6: 6 + 6 = 12$
- $7: 6 + 6 = 12$, add one more to get to 13.

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategies.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "How did the third expression help you find the value of the last expression?"

Activity 1

🕐 20 min

Check Yourself

Standards Alignments

Addressing   2.OA.B.2

The purpose of this activity is for students to identify the addition facts within 20 that they do not yet know from memory. They write these sums on index cards which can be used to help students build fluency throughout the section. Students should store these cards to use again in an upcoming lesson. The number choices in this activity include some of the facts that students may still be working to recall from memory at this point in the school year. If desired, the inventory of sums that students complete at the beginning of the activity could be replaced with a list of all sums within 20 or a smaller set of sums that best fit the needs of your students.

Student-facing Task Statement

1. Find the value of each sum mentally.

$6 + 6$	$7 + 9$	$8 + 6$
$9 + 9$	$6 + 8$	$3 + 9$
$7 + 7$	$9 + 2$	$5 + 6$
$8 + 8$	$7 + 5$	$9 + 5$
$5 + 5$	$8 + 4$	$5 + 9$
$9 + 8$	$2 + 9$	$9 + 6$
$7 + 8$	$9 + 7$	$8 + 9$
$8 + 5$	$6 + 9$	$6 + 7$
$6 + 5$	$8 + 3$	$5 + 7$
$7 + 6$	$9 + 4$	$8 + 7$

2. Circle any sum that you did not remember right away.

   Write each sum you circled on an index card.

   Use the index cards to work on building fluency with these sums.

Launch

- Groups of 2
- Give students access to index cards.

Activity

- "Find the value of each sum mentally."
- 2 minutes: independent work time
- "Circle any sums that you did not remember right away."
- Share answers. Prompt students to also circle any sums that they did not find correctly.
- "Write each expression that you circled on one side of an index card. Write the value of the expression on the other side. Then you can use the cards to practice these sums."
- "If you did not circle any expressions, make cards for some of the expressions that are the trickiest to remember. Make cards for these sums and think about what methods you use to remember these sums quickly. Be prepared to share."
- 6 minutes: independent work time
- Monitor for the sums that several students

Student Responses

1. $6 + 6 = 12$ $7 + 9 = 16$ $8 + 6 = 14$

    $9 + 9 = 18$ $6 + 8 = 14$ $3 + 9 = 12$

    $7 + 7 = 14$ $9 + 2 = 11$ $5 + 6 = 11$

    $8 + 8 = 16$ $7 + 5 = 12$ $9 + 5 = 14$

    $5 + 5 = 10$ $8 + 4 = 12$ $5 + 9 = 14$

    $9 + 8 = 17$ $2 + 9 = 11$ $9 + 6 = 15$

    $7 + 8 = 15$ $9 + 7 = 16$ $8 + 9 = 17$

    $8 + 5 = 13$ $6 + 9 = 15$ $6 + 7 = 13$

    $6 + 5 = 11$ $8 + 3 = 11$ $5 + 7 = 12$

    $7 + 6 = 13$ $9 + 4 = 13$ $8 + 7 = 15$

2. Students make cards for the facts they do not yet remember.

identify as a sum they need to work on.

- "Share your thinking with your partner."
- 2 minutes: partner discussion

Synthesis

- Display a list of sums that many students are still working on.
- "A lot of students wrote these sums on their cards. Choose one of the expressions and be ready to explain how you can remember the sum."
- Share and record responses.

Activity 2

🕐 15 min

Spin and Find the Missing Number

Standards Alignments

Addressing   2.OA.B.2

The purpose of this activity is for students to practice finding unknown addends within 20. Students use spinners to determine the total and one of the addends. They write addition equations or subtraction equations to represent how they found the unknown addend. Students connect the different equations in the synthesis and compare different methods for finding the unknown addend mentally.

This activity uses *MLR8 Discussion Supports*. Advances: listening, speaking, conversing

♿ Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Give students access to a number line or a number bond mat with base ten blocks. Allow students to recreate the problems in a concrete manner and continue to build a deeper understanding if needed.
Supports accessibility for: Conceptual Processing, Memory, Organization

Instructional Routines

MLR8 Discussion Supports

Materials to Gather

Paper clips

Materials to Copy

Spin and Find the Missing Number Spinners (groups of 2)

Student-facing Task Statement

Directions:
- Spin the top spinner to get your total.
- Spin the bottom spinner to get one addend.
- Find the unknown addend.
- Write an equation to show how you found the unknown addend.

my equations	my partner's equations

Launch

- Groups of 2
- Give each group the spinners and a paper clip.
- "Let's play a game to practice our addition and subtraction facts."
- "Spin the first spinner to get your total. Spin the second spinner to get one addend."
- Demonstrate spinning both spinners and naming your total and first addend.
- "Both players mentally find the missing addend."
- Think aloud, finding the missing addend.
- "Share your thinking with your partner. If you both agree on the missing addend, write and share equations that show how you found the missing number."

MLR8 Discussion Supports

- Display sentence frames to support small-group discussion:
    - "I agree because . . . ."

Student Responses

Sample responses:

my equations	my partner's equations
$11 = 6 + 5$	$11 - 6 = 5$
$18 - 8 = 10$	$8 + 10 = 18$
$15 - 9 = 6$	$9 + 6 = 15$

- ○ "I disagree because . . . ."
- Demonstrate writing an equation that best matches the method you used to find the missing addend.

Activity

- 10 minutes: partner work time
- Monitor for students who:
  - ○ decompose to get to a ten
  - ○ use known addition or subtraction facts
  - ○ make equivalent but easier sums

Synthesis

- "Read your equations. Which equations did you know right away?"
- "What did you do when you did not know the unknown number?"
- Invite previously identified students to share methods.

Advancing Student Thinking

If students disagree about the unknown number, encourage students to use the sentence frames and create drawings or diagrams to explain why they think their number would make the equation true.

Lesson Synthesis   ○ 10 min

Display:

A	$17 - 9$	B	$7 + 7$	C	$12 - 3$
D	$5 + 3$	E	$9 + 8$	F	$14 - 7$

"Which expressions would you group together? Why?" (A and E because you could use $9 + 8 = 17$ to find $17 - 9$. B and F because you could use $7 + 7$ to find the value of $14 - 7$. B, D, and E because they are all addition.)

Response to Student Thinking

Students rely on methods other than mental strategies.

Next Day Support

- Pair students up the next day to discuss their responses.

Lesson 2: Fluency Flip

Standards Alignments

Addressing   2.OA.B.2

Teacher-facing Learning Goals

- Fluently add and subtract within 20.

Student-facing Learning Goals

- Let's add and subtract fluently.

Lesson Purpose

The purpose of this lesson is for students to fluently add and subtract within 20 to find unknown addends.

In previous lessons, students assessed their fluency with sums and differences within 20. They shared different methods for finding the value of sums and differences mentally.

In this lesson, students find unknown addends within 20 and continue developing fluency with addition and subtraction within 20.

The cool-down should be completed before the lesson synthesis so that students can share their responses during the lesson synthesis.

Access for:

🧑‍🦯 Students with Disabilities

- Engagement (Activity 1)

🌐 English Learners

- MLR7 (Activity 1)

Instructional Routines

True or False (Warm-up)

Materials to Gather

- Materials from a previous activity: Activity 2

Materials to Copy

- Number Cards 0-19 (groups of 2): Activity 1
- Number Mix Up (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min

Teacher Reflection Question

Think about which students haven't shared their strategies in class lately. Were there missed

Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

opportunities to highlight their thinking during recent lessons? How can you take advantage of those opportunities when they arise?

Cool-down (to be completed at the end of the lesson) 🕐 5 min

Just the Facts

Standards Alignments

Addressing 2.OA.B.2

Student-facing Task Statement

Explain how you can use facts you know to find the value of sums and differences you don't know right away.

Student Responses

Sample responses:
- If you are subtracting, you can think of an addition fact to find the missing addend.
- If you are adding more than one number, you can look for ways to add the numbers you know quickly first.
- You can break apart one addend to make facts you know.

- **Begin Lesson** -

Warm-up 🕐 10 min

True or False: Sums within 20

Standards Alignments

Addressing 2.OA.B.2

The purpose of this warm-up is to elicit strategies and understandings students have for making expressions that are equivalent, but easier to find. These understandings help students develop fluency and will be helpful later in this lesson when students will need to be able to find missing digits that make equivalent expressions.

Instructional Routines

True or False

Student-facing Task Statement

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $8 + 5 = 8 + 2 + 5$
- $8 + 5 = 8 + 2 + 3$
- $8 + 5 = 10 + 3$

Student Responses

- False: both sides have $8 + 5$ and one side has 2 more.
- True: both sides have 8 and $2 + 3$ is the same as 5.
- True: the one before was true and $8 + 2$ is the same as 10.

Launch

- Display one statement.
- "Give me a signal when you know whether the statement is true and can explain how you know."
- 1 minute: quiet think time

Activity

- Share and record answers and strategies.
- Repeat with each statement.

Synthesis

- "How can the second statement help you with the last one?"

Activity 1

🕐 20 min

Heads Up: Make 20

Standards Alignments

Addressing   2.OA.B.2

The purpose of this activity is for students to add or subtract to find unknown addends within 20. Students will find unknown addends when the total is 20. The known addends may encourage

students to think about ways to make a ten and to use the sums and differences that they know (MP7).

🌐 Access for English Learners

MLR7 Compare and Connect. Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask, "Why did the different approaches lead to the same outcome? What did the methods have in common? How were they different?"
Advances: Representing, Conversing

♿ Access for Students with Disabilities

Engagement: Develop Effort and Persistence. Students may benefit from feedback that emphasizes effort and time on task. For example, give feedback on the partner relationship and how students are able to work together to complete a task. Encourage both partners to share ideas and speak up to agree or disagree.
Supports accessibility for: Social-Emotional Functioning, Attention

Materials to Copy

Number Cards 0-19 (groups of 2)

Required Preparation

- Create a set of cards for each group of 2.

Student-facing Task Statement

Directions:
- Partner A holds a card on their forehead without looking.
- Partner B names the number that you can add to the number on the card to get 20.
- Partner A says the number on their card.
- Record an equation to represent how you found the unknown addend.

my equations	my partner's equations

Launch

- Groups of 2
- Give each group a set of cards.

Activity

- "Let's play another game to find unknown addends."
- Select a volunteer to be your partner.
- "Partner A will draw a card and hold it on their forehead without looking."
- Prompt the volunteer to demonstrate.
- "Partner B names a number that you can add to the number on the card to get to

my equations	my partner's equations

Student Responses

Sample response:

my equation	my partner's equation
$20 - 8 = 12$	$12 + 8 = 20$
$13 + 7 = 20$	$20 - 7 = 13$
$20 - 15 = 5$	$20 - 5 = 15$

20."

- Think aloud finding and naming the number.
- "Partner A then names the number they are holding on their head."
- Prompt the volunteer to find the number.
- "Check your work and write an equation to represent how you found an unknown addend in the turn. Share your equation with your partner. Switch roles and play again."
- 12 minutes: partner work time
- Monitor for students who:
  - use place value reasoning or look to make 10
  - use known addition or subtraction facts
  - make equivalent, but easier sums or differences

Synthesis

- "Mai thought of trying to make 2 tens. What number needs to be added to 12 to make 2 tens?"
- "What other methods did you use to find the unknown addend?"
- Invite previously identified students to share methods.
- "Pull out the number cards for 0–9, as you will use them in the next activity."

Activity 2

🕐 15 min

Number Mix Up

Standards Alignments

Addressing   2.OA.B.2

The purpose of this activity is for students to create different expressions that have the same value. The activity encourages students to decompose numbers and to consider how they may create sums that are equivalent but easier to find as a mental strategy (MP7). Students use the number cards 0–9 from the previous activity to help them figure out the missing number in the equations.

Materials to Gather

Materials from a previous activity

Materials to Copy

Number Mix Up (groups of 1)

Required Preparation

- Each group of 2 needs the digit cards 0–9 from the card set used in the previous activity.

Student Responses

Puzzle 1: Sample response:

$6 = 2 + 4$ $6 = 6 - 0$
$6 = 5 + 1$ $6 = 8 - 2$
$6 = 9 - 3$ $6 = 7 - 1$

Puzzle 2: Sample response:

$7 = 1 + 6$ $7 = 8 - 1$
$7 = 2 + 5$ $7 = 3 + 4$
$7 = 9 - 2$ $7 = 7 - 0$

Puzzle 3: Sample response:

$11 = 8 + 3$ $11 = 6 + 5$
$11 = 9 + 1 + 1$ $11 = 7 + 4$
$11 = 11 - 0$ leftover: 2

Puzzle 4: Sample response:

$14 = 8 + 6$ $14 = 9 + 5$
$14 = 8 + 2 + 3 + 1$ $14 = 10 + 4$
$14 = 7 + 7$ leftover: 0

Launch

- Groups of 2
- Give each group a copy of the puzzles.

Activity

- "You are going to use your cards to complete number puzzles. You may only use numbers 0 through 9. You may only use each number one time to make all the equations true."
- 10 minutes: partner work time

Synthesis

- "What did you do when you ended with digits that you could not use to complete a true equation?" (We thought of other numbers that would work with what we had left. We completed the equations that had only 1 unknown first.)

Advancing Student Thinking

If students create equations that are not true in order to use all the digits, consider asking:

- "Which equations could only be made true using one of your digits?"
- "Which equations have many ways you could make them true?"

Lesson Synthesis

🕐 10 min

"Share your work from the cool-down with your partner. Then we'll share with the whole class."

– – – – – – – – – – – – – – – – – **Complete Cool-Down** – – – – – – – – – – – – – – – – – –

Response to Student Thinking

Students do not share a way to use a known fact or students do not share a method.

Next Day Support

- Pair students up the next day to discuss their responses.

Lesson 3: Measure on a Map

Standards Alignments

Addressing   2.MD.A.1, 2.MD.A.4, 2.MD.B.5, 2.OA.B.2
Building Towards   2.MD.A

Teacher-facing Learning Goals	Student-facing Learning Goals
• Fluently add and subtract within 20. • Measure lengths in standard units.	• Let's add and subtract measurements of length.

Lesson Purpose

The purpose of this lesson is for students to measure lengths in centimeters and add and subtract lengths within 20 to answer questions.

In this lesson, students add and subtract within 20 and build fluency within this range of numbers. They also practice measuring lengths in centimeters and use their measurements to add and subtract. The activities encourage students to consider ways to use properties of operations to make easier or known expressions and use the facts they know (MP7).

In the first activity, students measure lengths on a map and add and subtract their measurements to answer questions. They share the ways they used facts that they know to find the value of sums and differences. The questions focus on the measured distances in centimeters. It may be helpful to discuss how the actual distances between cities are much longer. However, proportional relationships, such as those in a map scale, is a grade 6 topic and should not be the focus of these activities. In the second activity, students solve Compare problems within the context of their measurements on the map.

The cool-down should be completed before the lesson synthesis so that students can share their responses during the lesson synthesis.

Access for:

♿ Students with Disabilities

• Engagement (Activity 1)

🌐 English Learners

• MLR2 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Rulers (centimeters): Activity 1

Materials to Copy

- Measurement Map (groups of 1): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

In previous lessons, students found unknown addends and shared methods that included looking for ways to get to a ten to add and subtract. How did you see students use these methods in today's lesson?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Practice Facts

Standards Alignments

Addressing   2.OA.B.2

Student-facing Task Statement

Review the cards you made in the first lesson.

1. Which sums do you know now that you didn't before?

2. What helped you remember the sum?

Student Responses

1. Answers vary.
2. Sample responses:
   - I thought of how I could quickly make a 10 and then add the rest.
   - I thought about how it was like a fact I know quickly.
   - I practiced and now I just know it.

- **Begin Lesson** -

Warm-up

🕐 10 min

Notice and Wonder: From Sea to Shining Sea

Standards Alignments

Building Towards   2.MD.A

The purpose of this warm-up is to elicit ideas about length and distance on maps, which will be useful as students measure the distance between cities on maps throughout the lesson activities. While students may notice and wonder many things about the map and map features, comments about the distance between cities, states, or other features on the map are the most important.

If there is a range of background knowledge about maps, cities, and states, it may be helpful to focus the synthesis on sharing what students know about U.S. geography and map features that will be helpful when completing the first activity.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?

Student Responses

Students may notice:

- It is a map of the United States.
- Some words are big and in all capital letters and some words are smaller.
- Some states are labeled.

Launch

- Groups of 2
- Display the image.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- Based on student responses, answer any questions to clarify the labels for cities and states.
- "What are things we could measure on a map?" (lines/borders of the states, the length or width of states, the distance between states and cities, the distance from one side

- Some cities are labeled.

Students may wonder:

- Why are only some states and cities on the map?
- How far is it from [city] to [city] or [state] to [state]?
- How long would it take to go from [city] to [city]?
- Where is [city/state] on the map?

of the country to the other)

Activity 1

Measure on the Map

⏱ 20 min

👤 ↔ 👤 PLC Activity

Standards Alignments

Addressing   2.MD.A.1, 2.OA.B.2

The purpose of this activity is for students to measure lengths to the nearest centimeter and to find the total distance each student moves on the map. The synthesis focuses on sharing student methods for addition using properties of operations and the sums they know from memory. When students measure and represent the trips with equations and find the total distance on the map, they reason abstractly and quantitatively (MP2).

Depending on students' experiences with maps and U.S. geography, it may be helpful to pause during the activity to share the strategies students use for locating cities and states on the map.

⊕ Access for Students with Disabilities

Engagement: Develop Effort and Persistence. Chunk this task into more manageable parts. Check in with students to provide feedback and encouragement after each chunk. For example, once students get the measurements for how far a child traveled, check in to discuss their strategy and provide feedback on efficiency and accuracy. Another option is once the students complete numbers 1–3, check in to discuss their strategy for finding the total distance each child traveled. *Supports accessibility for: Attention, Organization*

Materials to Gather

Rulers (centimeters)

Materials to Copy

Measurement Map (groups of 1)

Student-facing Task Statement

Draw a line to represent the distance between cities on the map. Then measure the length in centimeters.

1. Noah started in Trenton, New Jersey.

    a. First, he traveled to Harrisburg, Pennsylvania. _____ cm

    b. Next, he traveled from Harrisburg to Indianapolis, Indiana. _____ cm

    c. Last, he traveled from Indianapolis to St. Paul, Minnesota. _____ cm

2. Diego started in Sacramento, California.

    a. First, he traveled to Phoenix, Arizona. _____ cm

    b. Next, he traveled from Phoenix to Santa Fe, New Mexico. _____ cm

    c. Last, he traveled from Santa Fe to Topeka, Kansas. _____ cm

3. Lin started in Austin, Texas.

    a. First, she traveled to Oklahoma City, Oklahoma. _____ cm

    b. Next, she traveled from Oklahoma City to Nashville, Tennessee. _____ cm

    c. Last, she traveled from Nashville to Augusta, Maine. _____ cm

4. Find the total length of each student's trip. Represent the total with an equation.

    a. Lin's total

    b. Diego's total

    c. Noah's total

Student Responses

1.   a. 1 cm

      b. 4 cm

      c. 4 cm

2.   a. 5 cm

Launch

- Groups of 2
- Give each student a ruler and a map.

Activity

- "Use the map and your tools to measure the distances each student travels."
- 15 minutes: partner work time
- As students find the total length for each trip, monitor for students who:
    - explain or show methods that create equivalent, but easier or known sums
    - explain methods based on using known facts

Synthesis

- Invite 1–2 previously identified students to share their equation for Diego's total.
- Consider asking:
    - "How did you find Diego's total? Why did you make that decision?"
- Invite 1–2 previously identified students to share their equation for Lin's total.
- Consider asking:
    - "How did you find Lin's total? Why did you make that decision?"

b. 3 cm

c. 5 cm

3.   a. 3 cm

b. 5 cm

c. 9 cm

4.   a. 17 cm. $3 + 5 + 9 = 17$

b. 13 cm. $5 + 3 + 5 = 13$

c. 9 cm. $1 + 4 + 4 = 9$

Activity 2

⏲ 15 min

How Much Longer?

Standards Alignments

Addressing   2.MD.A.4, 2.MD.B.5, 2.OA.B.2

The purpose of this activity is for students to compare the lengths they measured in the previous activity. Students are encouraged to share and compare strategies they use for finding the unknown length.

As students compare lengths, ask them about the methods they are using. In particular, identify students who are using the following methods for finding difference:

- making equivalent, but easier sums or differences (making 10)
- using known facts (changing equations to make known facts, using relationship between addition and subtraction, etc.)

🌐 Access for English Learners

MLR2 Collect and Display. Circulate, listen for, and collect the language students use as they compare lengths. On a visible display, record words and phrases such as: "longer," "shorter," "nearest centimeter," "distance," "sum," and "difference." Invite students to borrow language from the display as needed, and update it throughout the lesson.
Advances: Conversing, Reading

Student-facing Task Statement

Use your map and the stories from the previous activity to answer the questions. Represent each story with an equation with a symbol for the unknown length.

1. How much shorter is the total length of Diego's trip than the total length of Lin's trip?
2. How much longer is the total length of Diego's trip than the total length of Noah's trip?
3. How much shorter is the total length of Noah's trip than the total length of Lin's trip?

Student Responses

1. 4 cm. Sample response: $13+? = 17$, $13 + 4 = 17$
2. 4 cm. Sample response: $9+? = 13$, $9 + 4 = 13$
3. 8 cm. Sample response: $17 - 9 =?$, $9 + 8 = 17$

Launch

- Groups of 2

Activity

- "Now answer the questions about the length of the path the students traveled on the map. Be ready to share your thinking with your partner."
- 4 minute: independent work time
- 2 minutes: partner discussion
- As students find the difference of Lin's and Noah's trips, monitor for students who:
  - use a known addition fact
  - explain or show counting up or back to make ten ($9 + 1 = 10$, $10 + 7 = 17$, $1 + 7 = 8$)
  - explain or show methods that create equivalent, but easier or known differences (add 1 to 17 and 9 to create $18 - 10 = 8$)

Synthesis

- Invite previously identified students to share their equation that shows the difference of Lin's and Noah's trips, or display: $17 - 9 = ?$
- "How could you use an addition fact that you know to find the unknown?" ($9 + 8 = 17$)
- "What is another way you could make this an easier difference to find?" (You could think about making a 10. Add 1 to the 9 and think about how many more you would need to get to 17. Add 1 to both numbers and subtract 10.)
- "Using addition facts you know and looking for ways to make easier expressions are two good methods for finding sums and differences accurately and quickly."

Advancing Student Thinking

If students add the lengths of the student trips rather than finding the difference, consider asking:

- "Who's trip is longer? Is their trip a little longer or much longer?"
- "How could you use a diagram to show the difference between the lengths of their trips?"

Lesson Synthesis   ⏱ 10 min

"Share your work from the cool-down."

1 minute: partner discussion

Share responses.

- - - - - - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - - - - - -

Response to Student Thinking

Students share a reflection without sharing any new methods they have learned.

Next Day Support

- Launch Activity 1 with a discussion about this cool-down.

Lesson 4: Measure and Plot

Standards Alignments

Addressing   2.MD.A.1, 2.MD.D, 2.MD.D.9, 2.NBT.B.5, 2.OA.B.2

Teacher-facing Learning Goals	Student-facing Learning Goals
• Fluently add and subtract within 20. • Measure lengths in centimeters. • Represent measurement data in a line plot.	• Let's create line plots and add and subtract measurements of length.

Lesson Purpose

The purpose of this lesson is for students to add and subtract within 20. Students measure lengths of objects and represent measurement data in line plots and answer questions about the data.

In this lesson, students continue to practice fluency with addition and subtraction within 20 with an emphasis on knowing from memory single-digit addition facts. Students revisit line plots, which they worked with in a previous unit. They measure the length of objects and use measurement data to create line plots.

Access for:

♿ Students with Disabilities

• Action and Expression (Activity 1)

🌐 English Learners

• MLR2 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

• Pencils: Activity 1
• Rulers (centimeters): Activity 1

Lesson Timeline

Warm-up	10 min

Teacher Reflection Question

Reflect on the development of students' fluency with addition and subtraction within 20. What

Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

activities or discussions particularly helped students during the year? What will you do differently next year to foster your students' fluency with addition and subtraction?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Supply Request

Standards Alignments

Addressing   2.MD.D, 2.OA.B.2

Student-facing Task Statement

1. What is the difference between the shortest and longest pencil in Class 1?

Length of Pencils in Class 1
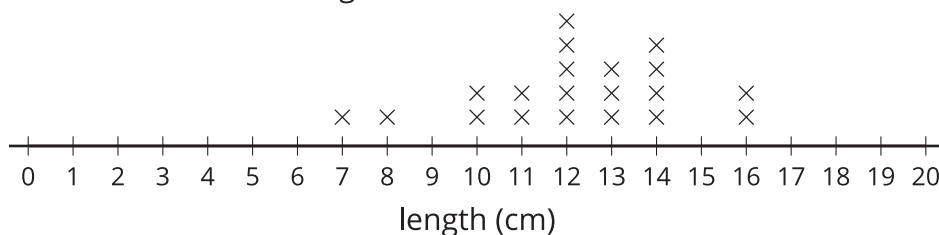
Write an equation to represent the difference.

2. What is the difference between the shortest and longest pencil in Class 2?

Length of Pencils in Class 2
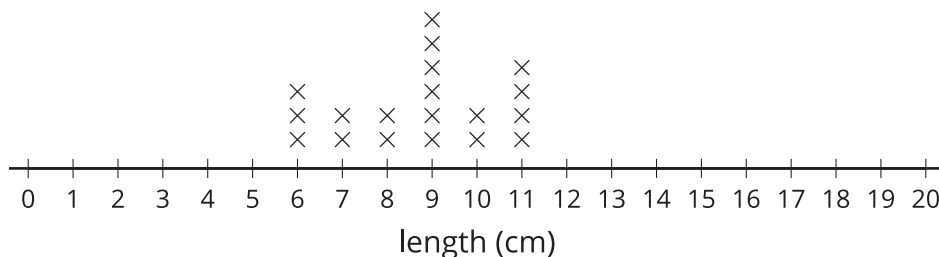
Write an equation to represent the difference.

Student Responses

1. 9 cm ($16 - 7 = 9$)
2. 5 cm ($11 - 6 = 5$)

---------------------------- Begin Lesson ----------------------------

Warm-up

🕐 10 min

Notice and Wonder: Line Plots

Standards Alignments

Addressing   2.MD.D.9

The purpose of this warm-up is to elicit students' understanding of line plots, which will be useful when students create and analyze line plots in a later activity. While students may notice and wonder many things about the measurement data, the characteristics of the line plot are the important discussion points.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?

patient	foot length (cm)
A	12
B	18
C	20
D	18
E	18
F	20
G	17
H	21

Launch

- Groups of 2
- Display the image.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Length of Patient's Feet
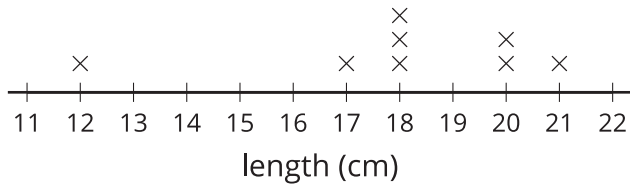
length (cm)

Student Responses

Students may notice:

- Both show measurements of foot length.
- One is a line plot.
- The line plot shows the same measurements as the table.
- The longest foot length was 21 centimeters.

Students may wonder:

- Is this from a doctor's office?
- Why is one foot so much smaller than the others?
- Does the line plot show the same measurements as the table or different measurements?

Synthesis

- "How is the line plot the same as the table? How is it different?" (They both represent the lengths of patients' feet. They both show the same measurements. The table helps you see the length of each patient's foot. The line plot helps you see the measurements together, but doesn't show you which patient had which length.)
- As needed, revisit features of a line plot (scale, meaning of each X, titles).

Activity 1

⏱ 20 min

May I Sharpen My Pencil?

Standards Alignments

Addressing   2.MD.A.1, 2.NBT.B.5, 2.OA.B.2

The purpose of this activity is for students to measure the length of objects (pencils) to the nearest centimeter and record their data in a table. Students add and subtract to answer questions about the data in the table and share strategies for how they find sums and differences. The numbers in the chart were chosen to invite students to look for ways to use methods based on the properties of operations and using known sums within 20 to find the total

lengths.

♿ Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Give students access to base-ten blocks or connecting cubes to represent the numbers they will add. Encourage students to build a ten when they can.
Supports accessibility for: Conceptual Processing, Organization

Materials to Gather

Pencils, Rulers (centimeters)

Required Preparation

- Each students needs an unsharpened pencil.
- The activity works best if it is likely that students will have a range of pencil lengths between and among groups. If necessary, sharpen pencils to different lengths and distribute them randomly to students.

Student-facing Task Statement

group	length of pencils in cm				total length
A	8	13	12	7	
B	9	15	7	10	
C	12	13	8	6	
D	9	9	11	13	
E					

1. Measure the length of your pencil. _____ cm

2. Write the lengths of your group's pencils in the table.

3. Find the total length of each group's pencils.

Student Responses

Answers vary. Sample response:

group	length of pencils in cm				total length
A	8	13	12	7	**40**
B	9	15	7	10	**41**

Launch

- Groups of 3–4
- Give each student an unsharpened pencil and a centimeter ruler.
- "Without measuring it, estimate the length of a brand new pencil."
- 30 seconds: quiet think time
- Share responses.
- "Measure the pencil to the nearest centimeter." (18 cm)
- 1 minute: group work time
- Share responses.

Activity

- Display the table.
- "The table shows the length of pencils from 4 different student groups."
- "Find the length of your own pencil and share it with your group. Record your

group	length of pencils in cm				total length
C	12	13	8	6	**39**
D	9	9	11	13	**42**
E	**11**	**10**	**14**	**8**	43

group's measurements in the table."

- 4 minutes: group work time
- "Use the table to find the total length of each group's pencils."
- 4 minutes: independent work time
- Monitor for students who:
    - look for ways to make sums by making 10 or finding easier sums

Synthesis

- Invite previously identified students to share strategies for how they found the total lengths.
- Record equations to emphasize how students rearranged or decomposed addends to make 10 or find sums.

Advancing Student Thinking

If students appear to only find the total lengths by adding each length from left to right or if student methods are unclear, consider asking:

- "How did you find the total length of group _____'s pencils?"
- "Which lengths did you add first? Why?"
- "Can you think of another way to find the sum?"

Activity 2

⏱ 15 min

A Plot Twist

Standards Alignments

Addressing   2.MD.D.9

The purpose of this activity is for students to plot their measurement data and to use the data to

answer questions (MP2). In the activity synthesis, students share the methods they use to add or subtract within 20 and discuss different ways that they can use the data in a line plot.

🌐 Access for English Learners

MLR2 Collect and Display. Synthesis: Direct attention to words collected and displayed from the previous lesson. Add to the display to include more comparison and measurement words. Invite students to borrow language from the display as needed, and update it throughout the lesson. *Advances: Conversing, Reading*

Student-facing Task Statement

1. Use the pencil measurements to create a line plot.

2. What is the most common pencil length? _____

3. What is the least common pencil length? _____

4. How many students had a pencil longer than 10 cm? _____

5. What is the difference between the longest pencil and the shortest pencil? Write an equation to represent the difference.

6. What is the difference between the shortest pencil and the length of an unsharpened pencil? Write an equation to represent the difference.

Student Responses

1. Sample response:

Length of Pencils

length (cm)
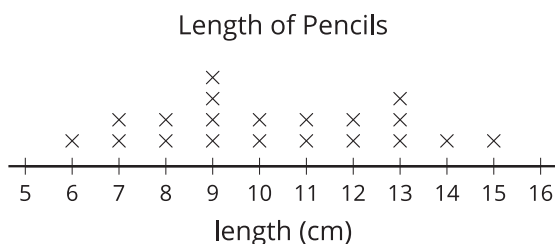
Launch

- Groups of 2

Activity

- "Use the table of measurements to create a line plot. When you and your partner are finished, compare your plots and work together to resolve any differences."
- 4 minutes: independent work time
- 2 minutes: partner discussion
- "Work together to answer the questions."
- 3 minutes: partner work time

Synthesis

- Invite 1–2 students to share methods for how they found the difference between the longest and shortest pencil or the difference between the shortest pencil and an unsharpened pencil. Consider selecting strategies based on making 10 and using known facts.
- "What other questions could we use the line plot to answer?" (How many people had a pencil that was _____ cm long? How many more students had a pencil that was _____ cm long than students who had a pencil that was _____ cm long?)
- Display a completed table from the first

2. Sample response: 9 cm
3. Sample response: 6 cm
4. Sample response: 9 students
5. Sample response: 9 cm, $15 - 6 = 9$
6. Sample response: 12 cm, $18 - 6 = 12$

activity and a line plot from the second activity.

- "What questions are easier to answer with the line plot? Explain."

Lesson Synthesis

🕐 10 min

"Today we used addition and subtraction to find sums of lengths and to compare lengths. We shared ways we used facts we know and ways to make 10 to make sums and differences easier to find."

Display:

$$14 - 8$$
$$14 - 4 = 10$$

"Mai is finding the difference between 14 and 8."

"First, she thinks, 'I know $14 - 4$ is 10.'"

"What should she do next?" (take away 4 more because you have to take away 8, find $10 - 4 = 6$)

If time, "What is another way you could use a fact you know to find the value of $14 - 8$?" ($8 + 6 = 14$)

-------- Complete Cool-Down --------

Response to Student Thinking

Students find a difference, but do not identify the longest and shortest pencil length accurately.

Next Day Support

- Before the warm-up, pass back the cool-down and work in small groups to make corrections.

Students find a difference other than 9 or 5 for $16 - 7$ or $11 - 6$.

Prior Unit Support

Grade 2, Unit 1, Section A: Add and Subtract Within 20

Section B: Numbers to 1,000

Lesson 5: Compose and Decompose Numbers Within 1,000

Standards Alignments

Addressing   2.NBT.A, 2.NBT.A.1

Teacher-facing Learning Goals

- Compose and decompose numbers within 1,000.
- Represent numbers within 1,000 in different ways.

Student-facing Learning Goals

- Let's represent numbers in many different ways.

Lesson Purpose

The purpose of this lesson is for students to compose and decompose three-digit numbers in different ways.

In previous units, students represented three-digit numbers by composing and decomposing units using base-ten blocks, base-ten diagrams, and equations.

In this lesson, students compose and decompose three-digit numbers using base-ten blocks and other representations that make sense to them. Throughout the lesson, students are encouraged to show and deepen their understanding of place value by composing and decomposing units.

Access for:

♿ Students with Disabilities

- Action and Expression (Activity 1)

Instructional Routines

MLR7 Compare and Connect (Activity 2), What Do You Know About _____? (Warm-up)

Materials to Gather

- Base-ten blocks: Activity 1
- Tools for creating a visual display: Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

In this section, students are working to develop fluency when adding and subtracting within 100. How does the work of the lesson help deepen students understanding of place value? How will the work of this lesson help students become more fluent when adding and subtracting within 100?

Cool-down (to be completed at the end of the lesson)   🕐 5 min
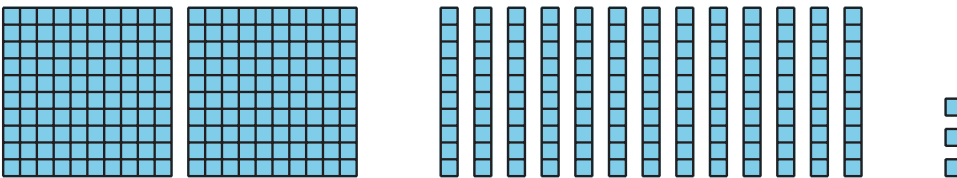
Two Hundred Sixty-Three
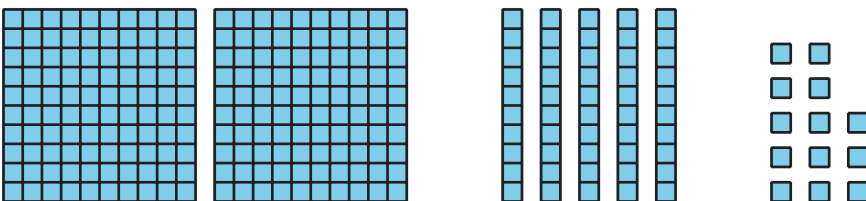
Standards Alignments

Addressing   2.NBT.A

Student-facing Task Statement

1. Circle the representations that show 263.

A.

B.

C. 2 hundreds + 4 tens + 23 ones

2. Represent 263 in a different way.

Student Responses

1. B, C
2. Sample responses:
   - 1 hundred + 16 tens + 3 ones
   - $200 + 60 + 3$
   - Students draw a base-ten diagram that shows 2 hundreds, 6 tens and 3 ones.

---------------------- **Begin Lesson** ----------------------

Warm-up

🕐 10 min

What Do You Know About 308?

Standards Alignments

Addressing   2.NBT.A, 2.NBT.A.1

The purpose of this What Do You Know About _____ is to invite students to share what they know about and how they can represent the number 308. Students use place value understanding as they describe the meaning of the digits in 308 and the different ways they can represent the number (MP7).

Instructional Routines

What Do You Know About _____?

Student-facing Task Statement

What do you know about 308?

Student Responses

Sample responses:
- 308 is 3 hundreds and 8 ones.
- 308 is 30 tens and 8 ones.

Launch

- Display the number.

Activity

- "What do you know about 308?"
- 1 minute: quiet think time
- Record responses.

- 308 is $300 + 8$.
- 308 is a three-digit number

Synthesis

- "What are different ways we could represent 308?"
- If it doesn't come up in student responses, consider asking:
  - "What do you think someone means if they said 308 has no tens? Would you agree?"
  - "Is there a way we could represent 308 with tens? "

Activity 1

🕐 15 min

How Many Did You Get?

Standards Alignments

Addressing   2.NBT.A, 2.NBT.A.1

The purpose of this activity is for students to represent numbers in different ways. The structure of the task encourages students to practice composing units and decomposing units. Students also have opportunities to use and connect concrete and abstract representations of three-digit numbers (MP2).

♿ Access for Students with Disabilities

Action and Expression: Internalize Executive Functions. Check for understanding by inviting students to explain in their own words. Ask questions regarding the base-ten blocks to check for deeper understanding. For example, "What does the hundred represent? How do you know that?" Look for students to explain in terms of tens and ones. Examples of this include: "There are ten rows of ten and that makes 100." "There are 100 ones that make up the 100." Tie these responses to the place value of the digit to reinforce the meaning behind the numbers.
Supports accessibility for: Memory, Organization

Materials to Gather

Base-ten blocks

Student-facing Task Statement

1. Start with 2 hundreds. Grab a handful of tens and of ones.

   a. What number do your base-ten blocks represent? _____

   b. Represent the same number in another way. Show your thinking using diagrams, symbols, or other representations.

2. Combine your blocks with your partner's blocks.

   a. What number do your base-ten blocks represent? _____

   b. Represent the same number in another way. Show your thinking using diagrams, symbols, or other representations.

3. Represent your group's number in the following ways:

   a. without hundreds

   b. without tens

   c. without hundreds or tens

Student Responses

1. Sample response:
   a. 324
   b. 3 hundreds + 1 ten + 14 ones. Students draw a base-ten diagram to show 3 hundreds, 1 ten, and 14 ones.

2. Sample response:
   a. 587
   b. $500 + 80 + 7 = 587$

3. Sample response:
   a. 58 tens 7 ones
   b. 5 hundreds 87 ones
   c. 587 ones

Launch

- Groups of 2
- Give base-ten blocks to each group.

Activity

- "We are going to represent numbers in different ways. Start with base-ten blocks, but you may use diagrams, symbols, or other representations to show your number."
- 8 minutes: partner work time
- Consider taking a picture of groups' blocks before and after they compose or decompose units for use in the synthesis.

Synthesis

- Display a picture or drawing of a group's blocks before they composed or decomposed units, such as:
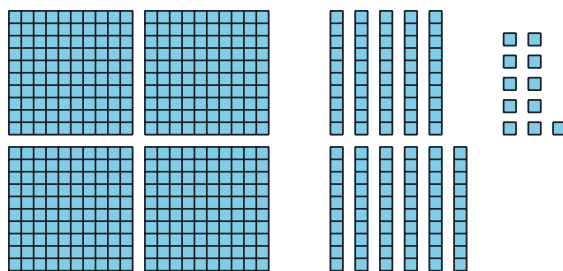
- "How could this group represent their number in another way?" (exchange 1 of the tens for 10 ones, exchange 10 tens for 1 hundred)
- Display a picture or drawing of a group's blocks that uses the fewest number of blocks, such as:
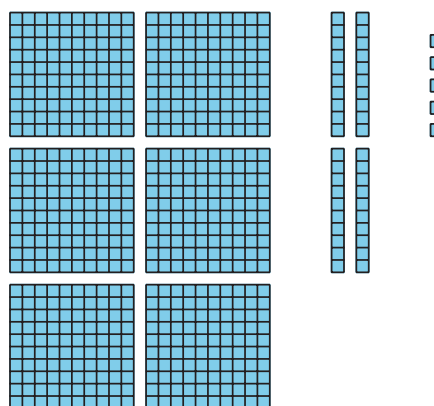
- "How could this group represent their number in another way?" (exchange 1 of the hundreds for 10 tens, exchange 1 ten for 10 ones, exchange all the tens for 40 ones)

Activity 2

Let Me Count the Ways

🕐 20 min

👤↔👤 PLC Activity

Standards Alignments

Addressing   2.NBT.A, 2.NBT.A.1

The purpose of this activity is for students to represent the same number in multiple ways. During the gallery walk, students are encouraged to connect different representations of a number that make use of structure in similar ways (for example, connecting a diagram and an equation that show the number using the same number of hundreds, tens, and ones). The lesson synthesis focuses on the different ways students represent 356 with expressions or equations. Students demonstrate their understanding of the structure of the base-ten system when they describe, compare, and connect different representations of the same three-digit number (MP7).

This activity uses *MLR7 Compare and Connect. Advances: representing, conversing*

Instructional Routines

MLR7 Compare and Connect

Materials to Gather

Tools for creating a visual display

Student-facing Task Statement

1. Represent 356 in at least 3 different ways. Show your thinking using diagrams, symbols, or other representations.

2. Create a poster with your group to show 356 in different ways.

Student Responses

Sample group response:

- Students draw a base-ten diagram with 3 hundreds, 5 tens, and 6 ones.
- Students draw a base-ten diagram with 2 hundreds 15 tens, and 6 ones.
- 3 hundreds 5 tens 6 ones
- 356
- three hundred fifty-six
- $300 + 56$
- $300 + 50 + 6$
- $300 + 40 + 16$
- $200 + 150 + 6$

Launch

- Groups of 3–4
- Give each group a piece of chart paper and markers.

Activity

- "Represent 356 in at least 3 different ways. You may use diagrams, symbols, or other representations. If you have time, you can represent 356 in more than 3 ways."
- 5 minutes: independent work time
- "Share your representations with your group. Work together to put each different way on your group's poster. If you have time, you may add other ways to represent the number."
- 5 minutes: group work time
- "You are going to rotate to see other group's posters. One person from your group should place a checkmark next to any representation your team also used to show 356."
- Prompt groups to rotate to the next chart every 1 minute.

Synthesis

- Display:
  - 3 hundreds + 4 tens + 16 ones
- "Does this expression show 356? Explain." (Yes. 16 ones is the same as one ten and 6 ones so it's the same as 3 hundreds 5 tens and 6 ones.)
- "This is one way we could show 356 as an expression. What other ways did you see groups represent 356 as an expression?"

- Record responses.

MLR7 Compare and Connect

- "How are the expressions the same? How are they different?" (They all show 356. Some expressions have different amounts of hundreds and tens. Some expressions use words.)
- 30 seconds: quiet think time
- 2 minute: partner discussion
- Share responses.

Advancing Student Thinking

If student groups use a limited variety of representations (for example, most groups only use different base-ten drawings), consider asking:

- "How could you represent this number with equations?"
- "How could you represent this number with words?"
- "How could you represent this number with digits?"

Lesson Synthesis   ⏱ 10 min

"Today we represented numbers with base-ten blocks, drawings, words, and equations. We composed larger units from smaller units and we decomposed larger units into smaller units."

"Why do you think it is important to be able to represent numbers in different ways?" (It can help you understand place value and numbers better. You may need to do it if you add or subtract numbers.)

- - - - - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - - - - - -

Response to Student Thinking

Students match 1 but not both representations for 263.

Next Day Support

- Add this cool-down to Activity 1 to review.

Lesson 6: Represent Numbers with Expressions

Standards Alignments

Addressing   2.NBT.A.1, 2.NBT.A.3

Teacher-facing Learning Goals

- Compose and decompose numbers within 1,000.
- Create and match expressions of numbers within 1,000.

Student-facing Learning Goals

- Let's compose and decompose numbers to make equal expressions.

Lesson Purpose

The purpose of this lesson is for students to demonstrate their understanding of place value by composing and decomposing numbers within 1,000 in different ways.

In this lesson, students practice using place value reasoning to compose and decompose units to find unknown numbers and create equivalent forms of three-digit numbers. They find the unknown numbers that make expressions equivalent and match expressions that represent the same number.

Although students should have access to base-ten blocks and tools to create base-ten diagrams as needed, students should also be encouraged to reason mentally based on their understanding of place value. The work of this lesson will support students' work with adding and subtracting within 1,000 and developing students' fluency in adding and subtracting within 100.

The cool-down should be completed before the lesson synthesis so that students can share their responses during the lesson synthesis.

Access for:

🧑‍🦽 Students with Disabilities

- Engagement (Activity 2)

🌐 English Learners

- MLR8 (Activity 2)

Instructional Routines

Card Sort (Activity 2), True or False (Warm-up)

Materials to Gather

- Base-ten blocks: Activity 1

Materials to Copy

- Match Expressions Cards 2.9 (groups of 2): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

In future lessons, students will be working on developing fluency with addition and subtraction within 100. How does the work of this lesson support students in developing fluency with sums and differences within 100?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Think of a Time

Standards Alignments

Addressing   2.NBT.A.1, 2.NBT.A.3

Student-facing Task Statement

Prepare to discuss a time when representing 241 as 2 hundreds, 3 tens, and 11 ones might be helpful.

Student Responses

Sample response:

- It might be helpful if you needed to subtract some ones. It makes it easier to think about subtracting hundreds from hundreds, tens from tens, and ones from ones.

- **Begin Lesson** -

Warm-up

🕐 10 min

True or False: Place Value

Standards Alignments

Addressing   2.NBT.A.1

The purpose of this True or False is to elicit the strategies and understandings students have for explaining why an equation is true based on place value. These understandings will be helpful later when students need to find ways to make equations true by attending to place value.

Instructional Routines

True or False

Student-facing Task Statement

Decide if each statement true or false. Be prepared to explain your reasoning.

- 5 hundreds + 2 tens + 7 ones = 527
- 4 hundreds + 12 tens + 7 ones = 527
- 5 hundreds + 7 ones + 2 tens = 527

Student Responses

- True: 527 is 5 hundreds 2 tens and 7 ones. The digits match the values.
- True: it's like decomposing 1 hundred into 10 tens. 4 hundreds and 12 ones is the same as 5 hundreds and 2 ones.
- True: it's the same as the first one, just the order of the ones and tens was switched around. It doesn't change the value of the sum.

Launch

- Display one statement.
- "Give me a signal when you know whether the statement is true and can explain how you know."
- 1 minute: quiet think time

Activity

- Share and record answers and strategies.
- Repeat with each statement.

Synthesis

- "What other ways could we write an expression that has a value of 527?"

Activity 1

🕐 20 min

Make Equations True

Standards Alignments

Addressing   2.NBT.A.1

The purpose of this activity is for students to use their understanding of place value to find the number that makes each equation true. Students must consider how units may be composed or decomposed to find the unknown number (MP7). The number choices intentionally emphasize the types of compositions and decompositions students may use to add and subtract within 1,000. The synthesis focuses on the equations that involve composing or decomposing two units.

Materials to Gather

Base-ten blocks

Student-facing Task Statement

Find the number that makes each equation true.

1. 5 hundreds + _____ tens + 6 ones = 5 hundreds + 5 tens + 16 ones

2. 1 hundred + 1 ten + 17 ones = 1 hundred + _____ tens + 7 ones

3. 4 hundreds + 15 tens + 3 ones = _____ hundreds + 5 tens + 3 ones

4. 4 hundreds + 3 tens + 7 ones = 3 hundreds + _____ tens + 7 ones

5. 7 hundreds + 8 tens + 4 ones = 7 hundreds + 7 tens + _____ ones

6. 6 hundreds + 9 ones = 5 hundreds + _____ tens + 9 ones

7. 2 hundreds + 9 tens + 17 ones = _____ hundreds + 7 ones

Launch

- Groups of 2
- Give students access to base-ten blocks.

Activity

- 5 minutes: independent work time
- "Take turns sharing your thinking with your partner. Show or explain how you know your equation is true."
- 3 minutes: partner discussion
- For finding the number that makes 2 hundreds + 9 tens + 17 ones true, monitor for students who:
  - explain by using base-ten blocks or place value diagrams
  - explain how they noticed when they would need to compose or decompose more than one unit

Synthesis

- Invite previously identified students to share their method for finding the unknown number for 2 hundreds + 9 tens + 17 ones = _____ hundreds + 7 ones.

8. 3 hundreds + 1 ten + 5 ones = 2 hundreds + 10 tens + _____ ones

If You Have Time: Make your own equation with a missing value for your partner.

Student Responses

1. 6
2. 2
3. 5
4. 13
5. 14
6. 10
7. 3
8. 15

If You Have Time: Answers vary.

- For students who use base-ten blocks, draw place value diagrams to record their explanation.
- Consider asking:
    - "How do you know both sides of the equation are equal?"
    - "Did you compose or decompose units? Did you compose or decompose more than one time?"

Advancing Student Thinking

If students create equations that are not true, prompt students to make the known side of the equation with base-ten blocks, consider asking:

- "How can you compose or decompose units to show the equation is true?"

Activity 2   ⏱ 15 min

Card Sort: Expressions with Three-digit Values

Standards Alignments

Addressing   2.NBT.A.1, 2.NBT.A.3

The purpose of this activity is for students to use their understanding of place value to find and create matching expressions. The activity encourages students to write expressions that show the

same value by composing or decomposing hundreds, tens, and ones. Although students may find the value of each expression to find matches, monitor for the ways they reason why two expression match or do not match by using what they know about hundreds, tens, and ones (MP7).

🌐 Access for English Learners

MLR8 Discussion Supports. Students should take turns finding a match and explaining their reasoning to their partner. Display the following sentence frames for all to see: "I noticed _____, so I matched . . . ." Encourage students to challenge each other when they disagree.
Advances: Speaking, Conversing

♿ Access for Students with Disabilities

Engagement: Develop Effort and Persistence. Chunk this task into smaller, more manageable parts. Instead of giving all 12 expressions, start with 4 (be sure that there are matches) and check in with students to provide feedback and encouragement on their thinking and effort. Ask students about their strategy, or about how they were able to determine the expressions that were the same. Look for thoughts on place value and combining some of the parts, not always just basic addition.
Supports accessibility for: Conceptual Processing, Attention, Organization

Instructional Routines

Card Sort

Materials to Copy

Match Expressions Cards 2.9 (groups of 2)

Required Preparation

- Create a set of cards from the Instructional master for each group of 2.

Student-facing Task Statement

Group the cards into sets of expressions that have the same value. Record the letters of the matching cards. Write an expression that represents the same value.

1. letters for matching expressions:

   _____

Launch

- Groups of 2
- Give each group a set of cards.

Activity

- "Work with your partner to find three expressions that have the same value."

new expression:

2. letters for matching expressions:
   _____

   new expression:

3. letters for matching expressions:
   _____

   new expression:

4. letters for matching expressions:
   _____

   new expression:

Student Responses

Sample responses:

1. A, F, K. $300 + 60 + 5$
2. B, G, L. $600 + 10 + 11$
3. C, H, J. $300 + 40 + 15$
4. D, E, I. $700 + 40 + 1$

- "Record the letters of the matching cards and write your own expression that has the same value."
- 10 minutes: partner work time

Synthesis

- Display cards C, H, and J.
- "Do these expressions match? Explain."
- "What other expressions did you write that match these expressions?"
- If time, consider asking:
  - "What other expressions could you write to match these expressions?"

Advancing Student Thinking

If students find matches that are not equivalent or do not explain their matches, consider asking:

- "How could you use base-ten blocks or diagrams to show your thinking?"

Lesson Synthesis
🕐 10 min

"Share your work from the cool-down with your partner. Then we will share with the class."

- - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - -

Response to Student Thinking

Students explain a situation that is not related to addition, subtraction, or reasoning about place value.

Next Day Support

- Launch warm-up or Activity 1 by highlighting important ideas from previous lessons.

Lesson 7: Add and Subtract Within 1,000

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.7

Teacher-facing Learning Goals

- Add and subtract within 1,000 with and without regrouping.
- Fluently add and subtract within 100.

Student-facing Learning Goals

- Let's add and subtract within 1,000.

Lesson Purpose

The purpose of this lesson is for students to add and subtract within 1,000 using methods based on place value.

In previous lessons, students practiced composing and decomposing three-digit numbers in different ways. The purpose of this lesson is to connect composing and decomposing numbers to methods for adding and subtracting numbers within 1,000. The first activity encourages students to consider which sums and differences within 1,000 would be least and most challenging to find. Students are encouraged to think about what might make finding the values of some expressions more challenging. They share the methods they use to find these values. The second activity focuses only on sums within 100 and encourages students to use and share methods that help them fluently find sums and differences.

Access for:

⦿ Students with Disabilities

- Engagement (Activity 2)

Instructional Routines

MLR8 Discussion Supports (Activity 1), Which One Doesn't Belong? (Warm-up)

Lesson Timeline

Warm-up	10 min
Activity 1	20 min

Teacher Reflection Question

How did students reason about which sums and differences were least and most challenging to find? What does this tell you about students' understanding of place value and number?

Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Cool-down (to be completed at the end of the lesson)   ⏱ 5 min

Add and Subtract Within 1,000

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.7

Student-facing Task Statement

1. Find the value of each expression.

   a.   **b.**   **c.**

   $84 - 22$ $504 + 183$ $56 + 27$

2. Which value was the most challenging to find? Explain.

Student Responses

1.   a. 62

      b. 687

      c. 83

2. Sample responses:

    ○   C because when you add 6 and 7 it makes a ten. I thought of $50 + 20 = 70$ and
        $6 + 7 = 13$ and added $70 + 13$ together.

    ○   C because I had to stop and think about how to make a ten. I thought of adding
        $56 + 4 = 60$ and then $60 + 23 = 83$.

- - - - - - - - - - - - - - - - - - **Begin Lesson** -

Warm-up

🕐 10 min

Which One Doesn't Belong: Add and Subtract Within 100

Standards Alignments

Addressing   2.NBT.B.5

This warm-up prompts students to carefully analyze and compare expressions. In making comparisons, students have a reason to use language precisely. Listen for the language students use to describe and compare the expressions with a focus on descriptions of the digits, the operations, place value, and whether or not units may be composed or decomposed when using methods based on place value (MP6).

Instructional Routines

Which One Doesn't Belong?

Student-facing Task Statement

Which one doesn't belong?

A. $74 - 23$

B. $24 + 37$

C. 4 tens + 2 ones + 3 tens + 7 ones

D. $60 + 19$

Student Responses

- A is the only expression that isn't addition.
- B is the only expression that you can't add by place without composing a ten.
- C is the only expression that doesn't use only digits.
- D is the only one that doesn't use the digits 7, 4, 2, and 3.

Launch

- Groups of 2
- Display the image.

Activity

- "Pick one that doesn't belong. Be ready to share why it doesn't belong."
- 1 minute: quiet think time
- 2–3 minutes: partner discussion
- Record responses.

Synthesis

- "Let's find one way each expression doesn't belong."

Activity 1

🕐 20 min

Which Would You Rather Find?

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.7

The purpose of this activity is for students to add and subtract within 1,000. Students begin the activity by analyzing different expressions without adding or subtracting to determine which values they think would be the least and most challenging to find. In the synthesis, students share different reasons why sums and differences were chosen to be "least" and "most challenging" and different methods for finding the values of the expressions.

Although students may have many different reasons for why they think expressions are more or less challenging to find, the synthesis focuses on reasons based on composing or decomposing units. Discussing whether students will compose or decompose units will support students in fluently finding sums and differences within 100 in the next activity.

This activity uses *MLR8 Discussion Supports. Advances: speaking*

Instructional Routines

MLR8 Discussion Supports

Student-facing Task Statement

A	G
$102 + 341$	$64 + 37$
B	H
$385 - 124$	$302 - 198$
C	I
$611 - 45$	$73 - 27$
D	J
$87 + 38$	$685 + 279$
E	K
$571 - 268$	$320 + 509$
F	L
$885 - 142$	$53 + 52$

Launch

- Groups of 2

Activity

- "Without finding the value of any of the sums or differences, read each expression and circle the two you think would be the most challenging to find the value of."

- 3 minutes: independent work time

- "Choose one of the expressions you circled and find the value. Then choose 2 other expressions and find their value."

- 4 minutes: independent work time

1. Circle 2 sums or differences you think would be the most challenging to find. Find the value of one of these expressions. Show your thinking.

2. Choose 2 other expressions and find the values. Show your thinking.

Student Responses

1. Sample response:
   - $685 + 279 = 964$
     $600 + 200 = 800$
     $80 + 70 = 150$
     $5 + 9 = 14$
     $800 + 150 = 950$
     $950 + 14 = 964$

2. Sample responses:
   - $102 + 341 = 443$
     $341 + 100 = 441$
     $441 + 2 = 443$
   - Students show finding $302 - 198 = 204$ on a number line by showing adding on 2, then 200, then 2 more.

- "Share your work with your partner. Explain why you picked your expressions and the method you used to find the values."

MLR8 Discussion Supports

- Display sentence frames to support students when they explain their strategy:
  - "I picked _____ because . . . ."
  - "First, I _____ because . . . ."
  - "I noticed _____ so I . . . ."
- 4 minutes: partner discussion

Synthesis

- Poll the class. For each expression, ask students to "Show one finger if the expression was not challenging, two fingers if it was a little challenging, or three fingers if it was the most challenging to find."
- Consider displaying:
  - A, D, E, F, H, J
- Stop for any expressions where there is a mix of ratings.
- Consider asking:
  - "Why did you feel this expression is more challenging?"
  - "Who can share why this expression was less challenging?"
- For expressions where most or all students felt the expression was most challenging, select students to share different methods for finding the value.
- "All the expressions you felt were most challenging can become less challenging with practice and using what you know about place value."

Activity 2

🕐 15 min

Add and Subtract within 100

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this activity is for students to fluently find sums and differences within 100. Students should be encouraged to use whatever method makes the most sense to them, including mental strategies. In the synthesis, students reflect on which values were least and most challenging to find.

♿ Access for Students with Disabilities

Engagement: Provide Access by Recruiting Interest. Provide choice and autonomy. Provide access to white boards and markers, or colored pencils and large paper for students to create a poster of their work. Encourage number lines or notation that show student thinking. If time allows, let students view each other's strategies in solving the same problems. Focus on the differences in strategies, but the similarities in answers.
Supports accessibility for: Attention, Organization, Social-Emotional Functioning

Student-facing Task Statement

1. Find the value of each expression.

A
$31 + 25$
B
$43 + 28$
C
$89 - 22$
D
$40 - 28$
E
$15 + 72$
F
$85 - 37$

G
$95 - 81$
H
$37 + 55$
I
$25 + 25$
J
$63 - 19$
K
$72 - 68$
L
$21 + 59$

2. Choose one value that you think was less

Launch

- Groups of 2

Activity

- "Now let's practice adding and subtracting with fluency."

- "Find the value of these expressions. Use any method that makes sense to you. You do not need to show your work with a representation or symbols, but be ready to share how you found each value."

- 5 minutes: independent work time

- "Share your thinking with your partner. Find 1 sum or difference that you both felt was the less challenging and 1 sum or

challenging to find. Explain.

3. Choose one value that you think was more challenging to find. Explain.

Student Responses

1. A

$$31 + 25 = 56$$

B

$$43 + 28 = 71$$

C

$$89 - 22 = 67$$

D

$$40 - 28 = 12$$

E

$$15 + 72 = 87$$

F

$$85 - 37 = 48$$

G

$$95 - 81 = 14$$

H

$$37 + 55 = 92$$

I

$$25 + 25 = 50$$

J

$$63 - 19 = 44$$

K

$$72 - 68 = 4$$

L

$$21 + 59 = 80$$

1. Sample responses:
   - A was less challenging because I could just add the ones and tens in my head.
   - It was less challenging because I just know 25 and 25 is 50.
   - K was less challenging because I counted up quickly to find the difference.

2. Sample responses:
   - F was more challenging because I tried to decompose a ten and then $15 - 7$ isn't a fact I know quickly.
   - F was more challenging because I had to do more steps. $85 - 30 = 55$, $55 - 5 = 50$, $50 - 2 = 48$

difference that you both feel was more challenging."

- 3 minutes: partner discussion
- Monitor for students who:
  - describe why A, C, E, or G are less challenging because they do not need to compose or decompose
  - describe why B, F, H, or J are more challenging because units are composed or decomposed or because they need to do more steps (in their head or on paper)
  - describe why D, I, K, or L were less challenging because they saw ways to count up or back quickly, make a 10, or used facts they know

Synthesis

- Share 1–2 sums students felt were least challenging.
- Invite previously identified students to share methods they used for finding the sums or differences mentally.
- Share 1–2 sums that students felt were most challenging.
- Invite previously identified students to share different methods for finding the values.

Advancing Student Thinking

If students find the value for an expression that is not correct or get stuck when finding a value, consider asking:

- "What do you know about the numbers in this expression?"
- "What methods from previous lessons could you use to find the value?"

Lesson Synthesis   ○ 10 min

"Today we practiced adding and subtracting with three-digit numbers. We also practiced fluently adding and subtracting two-digit numbers."

"When did you notice it was easier to find the values of expressions?" (If I noticed I could just add or subtract the hundreds, tens, and ones without any extra steps.)

"What methods did you hear from other students today that you want to try when adding or subtracting?"

- - - - - - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - - - - - -

Response to Student Thinking

Students find values other than 62, 687, and 83. Students identify an expression that was more difficult to find, but do not explain why.

Next Day Support

- Before the warm-up, pass back the cool-down and work in small groups to make corrections.

Lesson 8: Add and Subtract Within 100

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.7

Teacher-facing Learning Goals

- Add and subtract within 100.

Student-facing Learning Goals

- Let's fluently add and subtract within 100.

Lesson Purpose

The purpose of this lesson is for students to practice addition and subtraction within 100 to build fluency.

In previous lessons, students composed and decomposed units to add and subtract within 1,000. Students considered which sums and differences within 100 were more or less difficult for them to find.

In this lesson, students develop fluency with adding and subtracting within 100. In the first activity, all students play a new "Heads Up" game to practice fluency. This version of the game "Heads Up: Make 20" is structured differently (groups of 3, different recording directions) from the game in Section A. In the second activity, students choose which center game from previous units to play based on what they know they need to practice. Spinners and cards can be reused if they were saved from previous units or new cards can be printed for the centers and stages recommended for this lesson.

The cool-down should be completed before the lesson synthesis so that students can share their responses during the lesson synthesis

Access for:

♿ Students with Disabilities

- Representation (Activity 1)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Number Talk (Warm-up)

Materials to Gather

- Materials from a previous activity: Activity 2
- Materials from previous centers: Activity 2

Materials to Copy

- Heads Up - Add and Subtract within 100 Number Cards (groups of 2): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

What was the best question you asked students today? Why would you consider it the best one based on what students said or did?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Practice for Fluency

Standards Alignments

Addressing   2.NBT.B.5

Student-facing Task Statement

How have you improved with adding and subtracting within 100?

What do you still want to work on?

Student Responses

Sample responses:
- I have gotten better at subtracting and thinking about if I need to decompose a ten before I subtract ones.
- I still need to work on looking for ways to add or subtract in an easier way, like making a ten or counting up when the numbers are close.

- - - - - - - - - - - - - - - - - **Begin Lesson** -

Warm-up   🕐 10 min

Number Talk: Add by Place

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.7

The purpose of this Number Talk is to elicit strategies and understandings students have for adding by place. These understandings help students develop fluency and will be helpful later in this lesson when students will need to be able to consider place value when they add and subtract within 100.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $9 + 5$
- $20 + 30$
- $29 + 35$
- $229 + 435$

Student Responses

- 14: 9 plus 5 is a fact I know.
- 50: it's 2 tens and 3 tens. 50
- 64: first I added the ones, $9 + 5 = 14$. Then I added 14 and 50 to get 64.
- 664: I know 29 and 35 is 64 from the last expression. I just added 2 hundreds and 4 hundreds to get 600. $600 + 64$ is 664.

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategies.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "How is each sum related to the others?" (Sample response: The third expression is like the first and the second because you have to add $9 + 5$ and $20 + 30$ if you add by place.)

Activity 1

🕐 15 min

Heads Up, Add and Subtract within 100

Standards Alignments

Addressing   2.NBT.B.5

The purpose of this activity is to give students practice adding and subtracting within 100. Students work in groups of 3. One student adds to find the sum of 2 numbers. The other students add or subtract to find the unknown addend when one addend and the value of the sum are known. Although the majority of sums will fall within 100, some students may create sums greater than 100.

🌐 Access for English Learners

MLR8 Discussion Supports. Synthesis: Display question starters to support small group discussion about favorite role in the game: "Why did you . . . ?", "Can you say more about . . . ?"
Advances: Speaking, Conversing

⊕ Access for Students with Disabilities

Representation: Develop Language and Symbols. Support understanding of the problem by inviting students to act it out using manipulatives. For example, one student can build the numbers with base-ten blocks and the other students can complete the action of composing or decomposing to find and prove the answer.
Supports accessibility for: Conceptual Processing, Attention

Materials to Copy

Heads Up - Add and Subtract within 100
Number Cards (groups of 2)

Required Preparation

- Create a set of cards from the Instructional master for each group of 3.

Student-facing Task Statement

Write an equation that shows the value you found for each round you play.

Round 1:

Round 2:

Round 3:

Student Responses

Sample response:

Round 1: $39 + \underline{45} = 84$

Launch

- Groups of 3
- Give students number cards.

Activity

- "We are going to play a game called Heads Up."
- Demonstrate with 2 students.
- "Players A and B pick a card and put it on their foreheads without looking at it."
- "I am Player C. My job is to find the value of the sum and tell my group."

Round 2: $55 - 14 = \underline{41}$

Round 3: $66 + 24 = \underline{90}$

- "Players A and B use the other player's number and the value of the sum to determine what number is on their head."
- "Finally, each player writes the equation that represents what they did."
- Demonstrate writing an equation for each of the players.
- "After each round switch roles and play again."
- 10 minutes: small-group work time

Synthesis

- "Which role did you like best—Player C or Player A and B? Explain." (I liked to be Player C because I like to add. I liked being Player A or B because I could add or subtract. I liked being Player A or B because I could practice subtracting.)

Activity 2

🕐 20 min

Centers: Choice Time

Standards Alignments

Addressing   2.NBT.B.5

The purpose of this activity is for students to choose the center activity that will most help them build their fluency for addition and subtraction within 100. These two centers were introduced in previous units and focus on adding and subtracting within 100:

- Five in a Row
- Target Numbers

Materials to Gather

Materials from a previous activity, Materials from previous centers

Required Preparation

- Each group of 2 needs access to the cards used in the previous activity.
- Gather materials from previous centers:
    - Five in a Row, Stage 6
    - Target Numbers, Stages 3–5

Student-facing Task Statement

Choose a center.

Five in a Row

Target Numbers

Launch

- Groups of 2
- "Now you will choose from different center activities we learned. You may also choose to continue with Heads Up."
- Display the student page.
- "Think about which activity you would like to do first."
- 30 seconds: quiet think time

Activity

- Invite students to work at the center of their choice.
- 10 minutes: center work time
- "Think about what center you would like to do now."
- 30 seconds: quiet think time
- Invite students to work at the center of their choice.
- 10 minutes: center work time

Synthesis

- "What did you like about the activities you worked on today?"

Lesson Synthesis

🕐 10 min

"Share your work from the cool-down with your partner. Then we will share with the whole class."

- - - - - - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - - - - - -

Response to Student Thinking

Students write about what they did well, but nothing about what they have learned or want to improve.

Next Day Support

- Launch the lesson by asking students to recap the important points of the previous lessons.

Section C: Create and Solve Story Problems

Lesson 9: Sort the Story Problems

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.9, 2.OA.A.1

Teacher-facing Learning Goals

- Analyze story problems involving addition and subtraction within 100.

Student-facing Learning Goals

- Let's analyze story problems.

Lesson Purpose

The purpose of this lesson is for students to compare, connect, and solve story problems.

In previous lessons, students solved all the types of story problems including Add To, Take From, Put Together, and Compare with the unknown in all positions. The purpose of this lesson is to sort a variety of story problems, including two-step problems, and choose a problem to solve. Students sort the story problems and describe the categories they create. They then choose to solve the story problems using a method that makes sense to them. This lesson can be used to assess how students think about and make sense of story problems and the methods and representations they are most comfortable using to solve them (MP2).

Students work with story problems within 100 to reinforce the fluency expectation for grade 2.

Access for:

🧑 Students with Disabilities

- Action and Expression (Activity 1)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Card Sort (Activity 1), Number Talk (Warm-up)

Materials to Copy

- Card Sort Story Problems (groups of 1): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

The standards suggest using the relationship between addition and subtraction as one way of solving problems. How do tape diagrams support students in seeing this relationship within a problem? How can you help students continue to make these connections?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Book Donations

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Student-facing Task Statement

Jada's class gave away 19 books. Her class gave away 5 fewer books than Diego's class. How many books did Diego's class give away?

Show your thinking using diagrams, symbols, or other representations.

Student Responses

- Diego's class gave away 24 books. Sample response: $19 + 5 = 24$

-------------------- **Begin Lesson** --------------------

Warm-up   🕐 10 min

Number Talk: Use Place Value to Subtract

Standards Alignments

Addressing   2.NBT.B.5

The purpose of this Number Talk is to elicit strategies and understandings students have for finding the value of differences when they may need to decompose a ten. When students consider how they can use known differences, like $10 - 6$ or $14 - 6$, to find the value of the other expressions, they look for and make use of structure and express regularity in repeated reasoning (MP7, MP8).

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $10 - 6$
- $14 - 6$
- $54 - 6$
- $54 - 26$

Student Responses

- 4: I just know that it's 4.
- 8: I added 4 to the result of $10 - 6$.
- 48: I added 4 tens to the result of $14 - 6$.
- 28: I subtracted 20 from the result of $54 - 6$.

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategy.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "How can you use the result of $14 - 6$ to find the value of $54 - 6$?" (54 has 4 more tens than 14 so add 4 tens or 40 to the result of $14 - 6$.)
- "How can you use the result of $54 - 6$ to find the value of $54 - 26$?" (26 has 2 more tens than 6 so that means 2 tens need to be taken away from the answer to $54 - 6$.)

Activity 1

🕐 20 min

Card Sort: Story Problems

Standards Alignments

Addressing   2.OA.A.1

The purpose of this activity is to sort story problems into categories students choose. Monitor for students who identify these types of story problems:

- one-step problems
- two-step problems
- problems that compare quantities

Students may also use addition, subtraction, or both addition and subtraction as their categories. This may create some ambiguity since students might sort based on the operation suggested by the overall story structure or by the operation they would use to solve the problem. Some of the two-step stories may require both operations to solve. If students use the operations to sort and sort in different ways, this provides a good opportunity for discussion.

The goal of the activity synthesis is to share the different characteristics students used to sort the problems.

🌐 Access for English Learners

MLR8 Discussion Supports. Invite students to begin partner interactions by repeating the question, "What categories did you choose?" or, "Why did you put this problem into this category?" This gives both students an opportunity to produce language.
Advances: Conversing

♿ Access for Students with Disabilities

Action and Expression: Internalize Executive Functions. Check for understanding by inviting students to rephrase directions in their own words. Focus the students' thinking by questioning "What is the action in the problem? What is actually happening in the problem? How many steps would you need to solve?" Giving a little direction through questioning may help focus some students.
Supports accessibility for: Memory, Organization, Attention

Instructional Routines

Card Sort

Materials to Copy

Card Sort Story Problems (groups of 1)

Required Preparation

- Create a set of cards from the Instructional master for each student.

Student-facing Task Statement

Sort the story problems in a way that makes sense to you.

Student Responses

Sample responses:
- one-step problems
- problems with more than one step
- problems that compare
- problems with a starting value unknown
- problems with addition
- problems with subtraction
- problems with addition and subtraction

Launch

- Groups of 2
- "At the end of each school year, some schools donate books to families or charities to encourage summer reading. The students and teachers sort books, so they can decide which ones to keep and which ones to give away."
- "Some students reflect on the books they have read and choose their favorites. Many students think about the books they hope to read over the summer."
- "You will be sorting and solving story problems about books and reading."
- As needed, consider asking:
    - "Which of the books that you read this year would you want to keep and which would you be fine giving away?"
    - "What ways could you sort the books in our (classroom) library?"
    - "How many books are you hoping to read this summer?"

Activity

- "In this activity, you are going to sort the story problems in a way that makes sense to you."
- "You can think about the categories you would like based on what you notice is the same or different about the stories and how you might solve them."
- 5 minutes: independent work time
- "Compare your sort with your partner's. How are your sorts the same? How are they different?"
- 5 minutes: partner discussion
- Monitor for students who sort their cards in different ways.

Synthesis

- Invite selected students to share the categories for their sorts.
- Record the various categories.
- If students do not sort in any of the ways suggested in the student responses, propose these categories and ask them to sort.

Advancing Student Thinking

If students sort the story problems based on non-mathematical characteristics (for example, character names), consider asking:

- "Can you explain how you decided the groups for your sort?"
- "How could you sort the cards based on what you know from the story and what is unknown?"

Activity 2

⏱ 15 min

Solve Story Problems

Standards Alignments

Addressing   2.NBT.B.5, 2.NBT.B.9, 2.OA.A.1

The purpose of this activity is to solve the story problems from the first activity. Monitor for the different ways students represent their thinking and solve their selected problems including:

- tape diagrams to make sense of the problems
- base-ten diagrams
- equations

The goal of the activity synthesis is to share the different methods students used to make sense of and solve story problems (MP2).
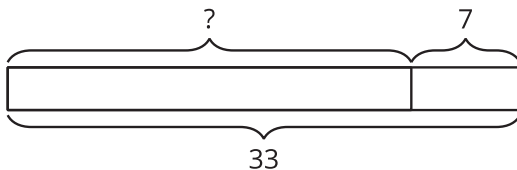
Student-facing Task Statement

Choose one of the story problems from the first activity to solve. Show your thinking using diagrams, symbols, or other representations.
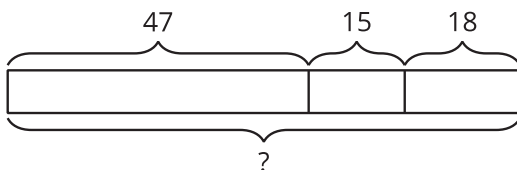
Student Responses

Sample responses:

1. Jada has 57 books now. $10 + 10 + 10 = 30$, $92 - 30 = 62, 62 - 5 = 57$.

2. Lin and Tyler put 33 books on the cart. $15 + 18$ Noah took 7 books off the cart. $33 - 7$ So there are 26 books on the cart.

3. The total number books sorted is 80. $47 + 15 + 18$. Since $15 + 18$ is 33 and $47 + 33$ is 80.

4. Lin has 28 books and Tyler has 17. $17 + 28 = 45$. Since $73 - 45 = 28$, there will be 28 books to give away.

5. Lin read 19 books since $14 + 5$ is 19. Together they read $14 + 19$ or 33 books last summer.

6. There were 51 books on the shelf at the start. $33 + 18 = 51$
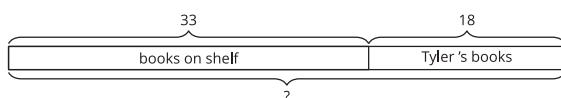
Launch

- Groups of 2

Activity

- "Choose one of the story problems from the first activity to solve. Pick a different problem than your partner."

- 5 minutes: independent work time

- "Share the method you used and the solution to your problem with your partner."

- 5 minutes: partner discussion

- Monitor for students who solved the story with Jada's stacks of books in different ways.
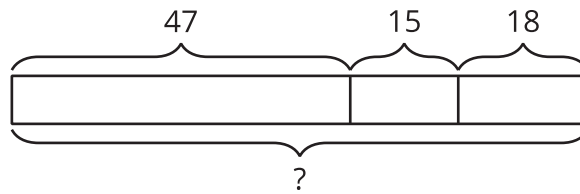
Synthesis

- Invite selected students to share their solutions for the story with Jada's pile of books in stacks of 10.

- "How are their methods the same? How are they different?"

Lesson Synthesis

🕐 10 min

Read the story problem about the books in Elena's class.

Draw a diagram to show:

47   15   18

?

"How does the diagram represent the problem?" (It shows the a part of the tape diagram for each day they sorted books. It shows the unknown is how many books altogether.)

"How does the diagram help you see how to solve the problem?" (It shows me I need to add 47, 15, and 18. I know I can add the numbers in any order.)

"What are other ways you or others made sense of story problems that had more than one step?"

- - - - - - - - - - - - - - - - - **Complete Cool-Down** - - - - - - - - - - - - - - - - -

Response to Student Thinking

Students write that Diego's class gave away 14 books because $19 - 5 = 14$.

Next Day Support

- Launch warm-up or activities by highlighting important representations from previous lessons.

Lesson 10: What's the Question?

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Ask and answer a question based on a given situation.
- Interpret story problems using diagrams.

Student-facing Learning Goals

- Let's determine the question for story problems.

Lesson Purpose

The purpose of this lesson is for students to analyze a tape diagram and number line diagram and determine, in context, a question that could be answered based on each representation.

In previous lessons, students sorted and solved a variety of story problems. In this lesson, students use given information to ask math questions and figure out what question was asked when presented with student work. Students interpret the context of a story and analyze tape diagrams to determine what question is being asked (MP2, MP4). Students then use a representation of their choice to answer a math question which they pose.

Access for:

⏀ Students with Disabilities

- Representation (Activity 2)

🌐 English Learners

- MLR8 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min

Teacher Reflection Question

In grade 3, students will continue to see and use tape diagrams and number line diagrams. How can you support their understanding of these diagrams and help them choose representations that make sense to them?

Cool-down	5 min

Cool-down (to be completed at the end of the lesson) 🕐 5 min

Ask It and Answer It

Standards Alignments

Addressing   2.OA.A.1

Student-facing Task Statement

Tyler put 26 apples into his basket. Clare put 35 apples into her basket.

Ask and answer a math question about this situation.

Student Responses

Sample response:

- How many more apples did Clare put in her basket than Tyler?
- Clare put 9 more apples in her basket than Tyler. $35 - 26 = 9$.

---------------------- **Begin Lesson** ----------------------

Warm-up 🕐 10 min

Notice and Wonder: A Day in the Park

Standards Alignments

Addressing   2.OA.A.1

The purpose of this Notice and Wonder is to elicit different questions from students about a story to prepare them for writing their own questions for a math story in an upcoming activity. Although students may notice and wonder many things, the most important discussion point will be the types of mathematical questions that can be asked about the story.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

In the park, there are 37 kids on the soccer field, 18 kids on the tennis courts, and 25 kids at the picnic tables.

What do you notice? What do you wonder?

Student Responses

Students may notice:
- There are more kids on the soccer fields than on the tennis courts.
- There are fewer kids on the tennis courts than at the picnic tables.
- There are more kids at the soccer fields than at the picnic tables.

Students may wonder:
- Why is there no question in this story?
- How many kids are there altogether at the park?
- How many kids are playing soccer or tennis?
- How many more kids are on the soccer field than on the tennis court?
- Are there more kids on the tennis courts and at the picnic tables than on the soccer field?

Launch

- Groups of 2
- Display the questionless story problem.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- "What are some mathematical questions that could be asked about this situation?"
- Record responses.
- "What do these questions have in common? How are they different?"

Activity 1

🕐 20 min

Asked and Answered

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to ask a question that can be answered with the given information and then answer the question. There are many different questions students can ask including:

- Who picked the most apples?
- How many apples did they pick together?
- Did Elena or Diego pick more apples?
- How many apples did Diego pick?

These questions require all the given information to solve. Students may also ask questions which require only some of the information to solve, such as, "How many apples did Han pick?" The activity synthesis focuses on sharing different questions students asked and how they found the answer, with a focus on the multi-step problem "How many apples did they pick altogether?" Images are provided for display, however, student work should be used as much as possible in the synthesis.

Student-facing Task Statement

Elena picked 29 apples. Elena picked 14 fewer apples than Han. Han picked 15 more apples than Diego.

1. Write a question someone could answer based on this information.

2. Answer your question. Show your thinking using diagrams, symbols, or other representations.

Student Responses

Sample response:

1. How many apples did Elena, Han, and Diego pick altogether?

2. 100. Han picked 14 more apples than Elena so that's 43 apples. Diego picked 15 fewer apples than Han so that's $43 - 15$ or 28. I added 29, 43, and 28 and got 100.

Launch

- Groups of 2
- "Sometimes people buy apples at the market or grocery store, but sometimes people go to an apple orchard to pick apples."
- "Each person gets a basket to collect the apples they pick, and then they pay for the apples."
- "Apple picking can be a fun outing for families and friends."
- "You will be reading a story and asking questions about friends who went apple picking together."

Activity

- Read the problem.
- "Think about the questions you could ask someone that this story could help them answer."
- 5 minutes: independent work time
- "Switch questions with your partner and

find the answer."

- "Share your thinking and check to see if you agree about the answer."

- 5 minutes: partner work time

- Monitor for students who represent how many apples Han picked and students who represent how many apples Diego picked compared to Han to share in the synthesis as shown.

Synthesis

- Invite students to share their questions.

- Display a diagram that represents the number of apples Han picked, such as:
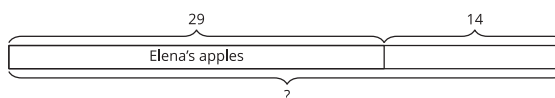
- "What does the diagram represent?" (The number of apples Han picked since he picked 14 more than Elena.)

- "How did you find how many apples Han picked?" (I added 30 to 14 to get 44 and then took away 1 to get 43.)

- Display a diagram that represents the number of apples Diego picked compared to Han, such as:
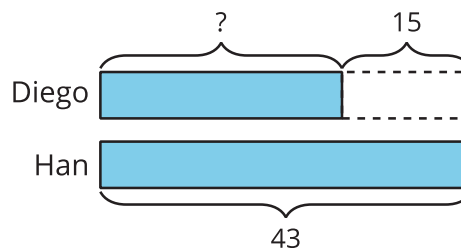
- "What does the diagram represent?" (How many apples Diego picked compared to Han.)

- "How did you find how many apples Diego picked?" (I took 15 away from 43.)

- "How did you find how many apples Elena, Han, and Diego picked altogether?" (I

added 29, 43, and 28. I put all the tens together to get 80 and all the ones together to get 20 then added 80 and 20.)

Advancing Student Thinking

If students write a question that can't be answered with the information given, consider asking:

- "What is the story about?"
- "What can be counted in the story?"
- "What quantities do you know? What is unknown?"

Activity 2

What is the Question?

🕐 15 min

👤↔👤 PLC Activity

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is to interpret student work with given numbers and use a story context to determine what question was answered. The first problem shows a tape diagram which puts together the three quantities in the story. The second problem shows a compare tape diagram with the three given quantities and an unknown. In each case, students need to reason about the representations and the given given information to determine what question the work could answer (MP2). Determining the relationships between quantities and using them to ask questions and solve problems is an aspect of modeling with mathematics (MP4).

The goal of the activity synthesis is to identify questions, especially for the second problem, and discuss strategies for performing the calculations.

🌐 Access for English Learners

MLR8 Discussion Supports. Display sentence frames to answer the questions during the synthesis.
"I noticed _____ so I . . . ."
.Advances: Speaking,, Conversing, Representing

♿ Access for Students with Disabilities

Representation: Access for Perception. Invite students to act out the scenario of what is happening in the story problem. Have the students pretend to combine the photographs to see the action in the problem. This helps students make the connection to addition.
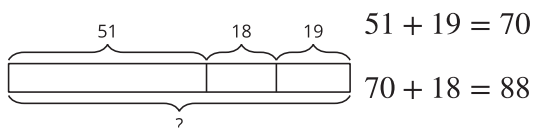*Supports accessibility for: Conceptual Processing, Attention*

Student-facing Task Statement

Clare picked 51 apples. Lin picked 18 apples and Andre picked 19 apples.

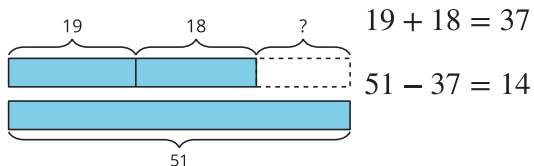Here is some student work showing the answer to a question about the apples.

1.

$$51 + 19 = 70$$
$$70 + 18 = 88$$

What's the question?

Explain how you know.

2.

$$19 + 18 = 37$$
$$51 - 37 = 14$$

What's the question?

Explain how you know.

Launch

- Groups of 2

Activity

- "You are going to look at some student work and figure out what question the student is trying to answer."
- Read the problem.
- 5 minutes: independent work time
- 5 minutes: partner discussion

Synthesis

- Invite 1–2 students to share questions for the first problem.
- "How did you know the student was trying to find a total amount?" (The tape diagram and student work shows addition.)
- "Why do you think the student added 51 and 19 rather than 51 and 18?" (They make 70 together. That way, there is no need to make a ten when you add the third number.)
- Invite 1–2 students to share questions for the second problem.

Student Responses

1. How many apples did Clare, Lin, and Andre pick altogether? The three parts of the diagram show the number of apples each person picked, 51 for Clare, 18 for Lin, and 19 for Andre. The question mark is for how many apples all 3 picked.

2. How many more apples did Clare pick than Lin and Andre combined? One bar in the diagram shows Clare's 51 apples. The other bar shows the 19 apples Andre picked, the 18 Lin picked, and the unknown is how many more Clare picked.

- "How did you know the question might be about comparing? Why not a question about taking away?" (The operation is subtraction but Lin's apples and Andre's apples aren't taken away from Clare's apples. The diagram helps see that it is a comparison.)
- "What strategies can you use to calculate $51 - 19 - 18$?" (Use the number line. Make a drawing. Subtract 20 and add 1, subtract 20 more and add 2.)

Advancing Student Thinking

If students write a question that doesn't match the context and the diagram, consider asking:

- "What do you notice about the student work?"
- "How do you think the student work connects to the story?"

Lesson Synthesis

🕐 10 min

"Today we wrote questions for story problems and used diagrams and equations to figure out what questions might have been answered."

"What do you need to know to be able to write a math question for a story?" (You need to know some numbers or amounts of things. You need something you can count or measure. You might need to know what people are doing, like putting things together or taking things away.)

"What clues in diagrams or equations can help you figure out what math question someone might be trying to figure out for a story?" (It helped to see what kind of diagram people were using. The question mark to show what was unknown was a good clue. We needed to know some parts of the story, like what was being counted or measured.)

------------------------- **Complete Cool-Down** -------------------------

Response to Student Thinking

Students ask a question that cannot be answered or find an incorrect solution.

Next Day Support

- Before the warm-up, pass back the cool-down and work in small groups to make corrections.

Lesson 11: All About Tape Diagrams

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Write and interpret story problems using diagrams and equations.

Student-facing Learning Goals

- Let's match diagrams, story problems, and equations.

Lesson Purpose

The purpose of this lesson is for students to make connections between story problems, equations, and tape diagrams.

In previous lessons, students analyzed and solved story problems.

In this lesson, students match story problems with tape diagrams and equations and write stories based on a tape diagram (MP2). The words in each story need to be interpreted carefully in order to decide which equation is the best match. For most problems, there is a choice for students to make because the problems can be represented and solved with either addition or subtraction. Likewise, tape diagrams can often be interpreted in multiple ways, either as showing addition or showing subtraction.

The lesson synthesis highlights how a tape diagram can help to students make sense of a story problem and decide on a method to solve the problem.

Access for:

♿ Students with Disabilities

- Action and Expression (Activity 2)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Number Talk (Warm-up)

Materials to Copy

- Represent Story Problem Cards (groups of 2): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Students have used tape diagrams to interpret different situations. How have these diagrams helped your students interpret story problems? How can you leverage the connections students make between story problems, diagrams, and equations when they solve problems in upcoming lessons?

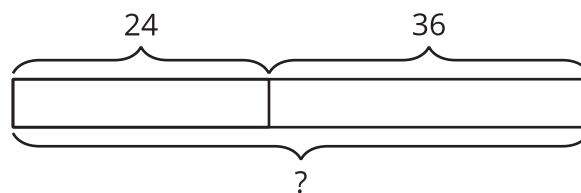# Cool-down (to be completed at the end of the lesson)   ⏰ 5 min

What's the Story?

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Student-facing Task Statement

Write and solve a story problem that the diagram could represent.

Student Responses

Sample response:

- Jada has 24 red beads and 36 blue beads. How many beads does Jada have altogether?
- Jada has 60 beads in all. I know that 20 and 30 are 50. 6 and 4 make 10.

- - - - - - - - - - - - - - - **Begin Lesson** - - - - - - - - - - - - - - -

Warm-up

🕐 10 min

Number Talk: Addition and Subtraction

Standards Alignments

Addressing   2.NBT.B.5

The purpose of this Number Talk is to elicit strategies and understandings students have for relating the operations of addition and subtraction. The equations $27 + 13 = 40, 40 - 13 = 27$, and $40 - 27 = 13$ each show the same relationship between numbers. Students will use this idea during the lesson when they are given a tape diagram and discuss why an addition or subtraction equation might match.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $7 + 13$

- $27 + 13$

- $40 - 13$

- $40 - 27$

Student Responses

- 20: I just knew it.
- 40: I added $20 + 10 + 10$ to get 40.
- 27: I know $27 + 13$ is 40 so $40 - 13$ is 27.
- 13: I know $27 + 13$ is 40 so $40 - 27$ is 13.

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategies.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "How can you use your answer for $27 + 13$ to find the value of $40 - 13$?" ($27 + 13$ is 40 so $40 - 13$ is 27.)
- "How can you use your answer for $27 + 13$ to find the value of $40 - 27$?" ($27 + 13$ is 40 so $40 - 27$ is 13.)

Activity 1

⏰ 20 min

Represent Story Problems

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is to match story problems with equations and tape diagrams. The numbers were selected so that there is a pair of stories, tapes, and equations using the same set of numbers. In order to determine the matching sets, students will need to think about and describe how the expression and diagrams represent the context of the story (MP2).

The goal of the activity synthesis is to discuss matching representations, highlighting how the tape diagram can help students understand the story and visually represent the equation.

🌐 Access for English Learners

MLR8 Discussion Supports. Students should explain their reasoning for making each match to their partner. Display the following sentence frames for all to see: "I noticed _____, so I matched . . . ." Encourage students to challenge each other when they disagree.
Advances: Speaking, Conversing

Materials to Copy

Represent Story Problem Cards (groups of 2)

Required Preparation

- Create a set of cards from the Instructional master for each group of 2.

Student-facing Task Statement

Match the stories, diagrams, and equations.

Student Responses

A, F, K

B, G, I

C, E, J

Launch

- Groups of 2
- Give each group a set of cards.

Activity

- "You have a set of 4 story problems, 4 diagrams, and 4 equations. Your goal is to find 4 matching sets."

D, H, L

- 5 minutes: independent work time
- 5 minutes: partner discussion
- Monitor for how students distinguish the pairs of stories using the same numbers, especially those who use the tape diagrams to figure out the operation and equation.

Synthesis

- Display tape diagrams for stories A and B.
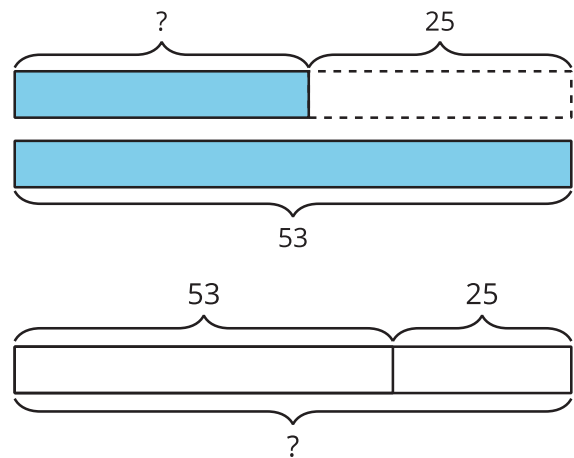
- "How are the two diagrams the same? How are they different?" (Both diagrams have a 53 and a 25. One diagram shows two separate rectangles comparing quantities. 53 is the total for one of the rectangles. In the other diagram 53 is one part and the total is unknown.)
- "Which problem does the first diagram match? How do you know?" (The baseball and tennis ball problem. The first bar shows 53 and the second bar shows 25 less than 53.)
- "How is this different from the pine cone problem?" (53 is how many pine cones are left after 25 were taken away.)
- "Why does the second diagram match the pine cone problem?" (It shows that 53 are left if you take away 25.)

Advancing Student Thinking

If students sort cards that do not match, consider asking:

- "What is the same about the cards in this group? What is different?"
- "How does the equation match the story? How does it match the tape diagram?"
- "How does the diagram match the story? How does it match the equation?"

Activity 2

🕐 15 min

Write Stories

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is to write story problems that match given tape diagrams (MP2). One diagram represents a one-step Compare problem while the other two show two-step problems. For the tape diagram with three addends, students might:

- write Put Together/Take Apart or Add To stories with an unknown addend
- write Take Away stories with the change or difference unknown
- write a Compare problem that compares the full tape to the sum of the first two sections

For the tape diagrams that represent Compare problems, students may phrase the question using "How many more . . . ?" or using "How many fewer . . . ?" Although these diagrams are typically used to represent Compare problems, students may also choose to write Put Together/ Take Apart or Take Away problems.

The lesson synthesis highlights different types of stories students write that match the same tape diagram.

### ♿ Access for Students with Disabilities

Action and Expression: Internalize Executive Functions. Invite students to talk through their strategy, including the type of problem represented in the tape diagram image, the operation that is needed, and a possible context for the story that will represent the tape diagram. If time allows, invite students to share their plan with a partner before they begin writing.
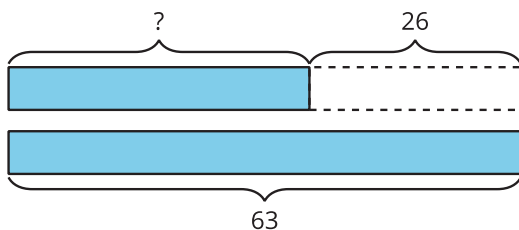*Supports accessibility for: Attention, Organization*

Student-facing Task Statement

Choose one of the diagrams. Write and solve a story problem that the diagram could represent.
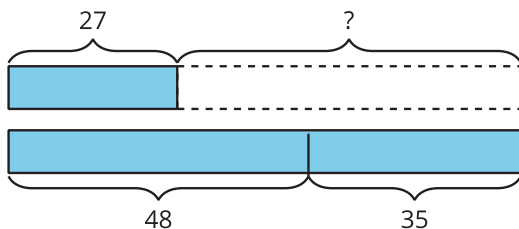
1.

37   24   ?

96

2.

?   26

63

3.

27   ?

48   35
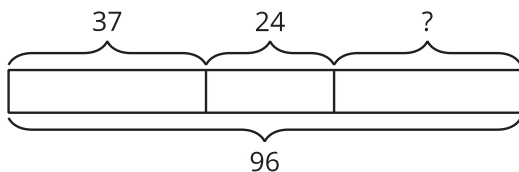
Problem _____

Student Responses

Sample responses:

1. Noah, Mai, and Andre have 96 tickets to use at the carnival. Noah has 37 tickets and Mai has 24 tickets. How many tickets does Andre have? $37 + 24 = 61, 96 - 61 = 35$

   Tyler has 37 carnival tickets, Lin has 24 carnival tickets, and Diego has has 96 carnival tickets. How many more carnival tickets does Diego have than Tyler and Lin combined?

Launch

- Groups of 3
- "We are now going to write math stories. What are some things in our school that you could count and write stories about?" (kids, teachers, chairs, tables, classrooms, sports equipment, posters, windows)
- Make a list of student ideas on a chart and save the chart for the next day's lesson.

Activity

- "Now you are going to look at a few tape diagrams and choose one diagram to write a story problem that matches it. Use the chart for ideas if you'd like."
- "In your group of 3, make sure everyone is working on a different diagram. You will have 5 minutes to work on your own, then you will have time to share your story problem with your group and get feedback on it."
- "Before we come back together as a whole group, take time to make any revisions to your stories after you receive feedback."
- 5 minutes: independent work time
- 5 minutes: group work time
- Monitor for students who write different types of stories for the same tape diagram.

Synthesis

- Invite previously identified students to share their stories for the same tape diagram or share one story and have the class generate a different story after discussing the student work.
- "How did you know that the second diagram represents a comparison?" (It has two different rectangles. We know the

2. Elena has 63 cents. She has 26 cents more than Kiran. How many cents does Kiran have? $63 - 20 = 43, 43 - 3 = 40,$ $40 - 3 = 37$

3. Jada has 48 songs on her playlist. She adds 35 more songs to her playlist. Han has 27 songs on his playlist. How many more songs does Jada have on her playlist than Han? $48 - 27 = 21, 21 + 35 = 56$

larger amount, but it shows a question mark for the smaller amount.)

- "How did you solve the problem?" (I subtracted 20 from 63 and then subtracted 6. Or, I added 4 to 26 to make 30, then added 3, and then added 30 more.)

Lesson Synthesis

🕐 10 min

"Today we connected story problems to diagrams and equations. We also used diagrams to create our own story problems."

"What did you look for in the diagrams to help you match it to a story or an equation?"

"How did the diagram help you write a story problem?"

---------------- **Complete Cool-Down** ----------------

Response to Student Thinking

Students write a story problem that does not match the diagram.

Next Day Support

- Pair students up the next day to discuss their responses.

Lesson 12: What's the Story?

Standards Alignments

Addressing   2.NBT.A, 2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- See math in the world around them.
- Write story problems using expressions.

Student-facing Learning Goals

- Let's write story problems.

Lesson Purpose

The purpose of this lesson is for students to ask mathematical questions and write story problems based on a given expression.

In previous lessons, students solved story problems of all types, matched them with tape diagrams and equations, and wrote stories to match tape diagrams. In this lesson, students write story problems to match equations, ask mathematical questions based on pictures and about their environment, and write story problems based on their observations. The goal of the lesson synthesis is for students to discuss which story they liked the most of those that were shared.

Access for:

♿ Students with Disabilities

- Action and Expression (Activity 2)

🌐 English Learners

- MLR8 (Activity 2)

Instructional Routines

Estimation Exploration (Warm-up)

Materials to Gather

- Connecting cubes: Activity 2
- Materials from a previous lesson: Activity 1

Materials to Copy

- Story Photos (groups of 2): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min

Teacher Reflection Question

Which students had opportunities to share their math story problems and thinking during the whole-class discussion? How did you select

Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

these students?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

What Could the Question Be?

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Student-facing Task Statement

Tyler writes the equation $24 + 37 = 61$ to answer a question about the picture.

Write a story problem with a question that Tyler's equation could answer.

Student Responses

Sample response: There are 24 kids running. There are 37 more kids behind them walking. How many kids are there altogether in the race? There are 61 kids in the race.

- - - - - - - - - - - - - - - **Begin Lesson** - - - - - - - - - - - - - - -

Warm-up

🕐 10 min

Estimation Exploration: How many People?

Standards Alignments

Addressing   2.NBT.A

The purpose of an Estimation Exploration is to practice the skill of estimating a reasonable answer based on experience and known information. For this picture, it is hard to tell how many people there are, so a wide range of responses can be considered "about right." Students will also use this image in the cool-down, and there is an option for them to use the picture to generate ideas for story problems.

Instructional Routines

Estimation Exploration

Student-facing Task Statement

How many people are in the picture?

Record an estimate that is:

too low	about right	too high

Student Responses

Sample responses:
- too low: 0–50
- about right: 100–500
- too high: 1,000 or more

Launch

- Groups of 2
- "How many people are in the picture?"
- "What is an estimate that's too high? Too low? About right?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Record responses.

Synthesis

- "How did you make an estimate that was too low?" (I saw 10 to 20 kids running in front and then a whole lot of people behind them, so I made a low estimate of 50.)
- "How did you make an estimate that was too high?" (It is hard to tell how far back the people go, so I just said 1,000.)
- "Based on this discussion, does anyone want to revise their estimate?"

Activity 1

🕐 15 min

What's the Story?

Standards Alignments

Addressing   2.OA.A.1

The purpose of this activity is to write story problems for equations with an unknown value. There is a pair of addition and subtraction equations and in each pair one of them has the starting value unknown. Students may write Add To, Take From, Put Together/Take Apart, or Compare problems. When students contextualize the equations and make connections between the stories their peers share and the equations, they reason abstractly and quantitatively (MP2).

Materials to Gather

Materials from a previous lesson

Student-facing Task Statement

Your teacher will assign you A or B. For each of your equations, write a story problem that fits the equation.

A Equations	B Equations
$23 + \underline{\hspace{1cm}} = 37$	$73 - \underline{\hspace{1cm}} = 28$
$\underline{\hspace{1cm}} + 9 = 45$	$\underline{\hspace{1cm}} - 15 = 18$

Student Responses

Sample responses:

A. There were 23 kids in the gym. Then some kids came to the gym. Now there are 37 kids in the gym. How many kids came to the gym?

There were some kids in the gym. Then 9 more kids came to the gym. Now there are 45 kids in the gym. How many kids were in

Launch

- Groups of 2
- Display list of topics for story problems from the previous lesson.

Activity

- Split the class into two groups, A and B. The students in group A will work with the equations labeled A and the students in group B will work with the equations labeled B.
- "You will write stories for the 2 equations in A or the 2 equations in B. Consider using the same context for both of your stories. It might make it easier for others to make sense of your stories if they are about the same thing."
- 5 minutes: independent work time
- "Share your stories with your partner."

the gym at first?

B. There were 73 pattern blocks in the bag. Clare took out some pattern blocks. Now there are 28 pattern blocks in the bag. How many pattern blocks did Clare take out?

There were some pattern blocks in the bag. Diego took out 15 pattern blocks and now there are 18. How many pattern blocks were in the bag?

- 5 minutes: group work time

Synthesis

- Display text: "There are 23 baseballs in the gym and 37 baseballs on the playground."

- "This is Andre's story. Does the equation $23 + \underline{\hspace{1cm}} = 37$ represent Andre's story?" (No, Andre's story doesn't have a question or anything happening. It might match, but it needs more information or a question.)

- "How would you improve Andre's story?" (He could add a question like, "How many more baseballs are on the playground than in the gym?" He could keep it about baseballs, but add some things that happen. He might say someone took the 23 baseballs to the playground and now there are 37 baseballs on the playground and ask how many were already on the playground.)

- Record student suggestions for revising Andre's story.

- "Does the equation $23 + \underline{\hspace{1cm}} = 37$ represent any of these stories now?" (It represents the question about how many more baseballs are on the playground.)

Activity 2

🕐 20 min

Make Math Stories

Standards Alignments

Addressing   2.OA.A.1

The purpose of this activity is for students to write math stories. Several options are available for fueling their imagination, including:

- looking at pre-selected images such as the one used in the Estimation Exploration in this lesson or those in the optional Instructional master
- looking at images in magazines or newspapers
- looking around the classroom
- going for a walk around the school or community

Whichever source is used for ideas, students write a story problem that connects to mathematical ideas they have found. If students come up with a context, but are not able to count or estimate the quantities they see, display a set of numbers (such as 11, 25, 38, 56, 77, 93) that students can use to write their story problem.

When students write math stories based on images or things in their environment, and eventually answer those questions, they model with mathematics (MP4).

🌐 Access for English Learners

MLR8 Discussion Supports. Synthesis: Provide students with the opportunity to rehearse what they will say with a partner before they share with the whole class.
Advances: Speaking

♿ Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Provide students with alternatives to writing on paper. Students can share their learning by drawing or creating a picture of their story problem, or verbally by creating a video that tells their story.
Supports accessibility for: Attention, Organization, Language

Materials to Gather

Connecting cubes

Materials to Copy

Story Photos (groups of 2)

Required Preparation

- Gather a see-through container with a collection of connecting cubes (or other math tool or object that might generate different math questions) to display in the launch.
- (Optional) Provide a copy of the Instructional master for each group of 2 students.

Student-facing Task Statement

Write a story problem.

Launch

- Groups of 2
- Display the see-through container with connecting cubes (or other math tool).

Student Responses

Sample responses (for the picture from the warm-up):

- There are some kids and some adults in the race. How many people are in the race?
- There are some people running and some people watching. How many people are there altogether?
- There are some kids and adults in the race. How many more kids are there than adults?
- Some kids started running the race. Some kids walked. Did more kids run or walk? How many more?

- "What are some math questions you can ask about the connecting cubes?" (How many connecting cubes are there altogether? How many green connecting cubes are there? Are there more blue connecting cubes or yellow connecting cubes? How many more?)
- 1 minute: independent think time
- 1 minute: partner share time
- Share student responses, highlighting in each case how it could be made into a story problem (for example, "How many connecting cubes are there?" could be answered if we knew how many there are of each color.)

Activity

- "Now, we are going to look for mathematical ideas in _____. Your goal is to take notes about what you see. Focus on things that can be counted, so that you can write a story problem about it."
- "If you have time, you can count or estimate what you see. If not, write a story without exact quantities, and I will give you numbers that you can use in your story."
- 8 minutes: math walk
- "Write a story problem and then share with your partner."
- 8 minutes: partner work time
- Monitor for students who write different types of stories: single-step, two-step, Add To, Take From, Put Together/Take Apart, and Compare.

Synthesis

- Invite selected students to share their stories.

Lesson Synthesis

🕐 10 min

"What is your favorite story that you heard today? Why?"

"Tomorrow you will make a poster to share your story and a solution, and then you'll look at all of your classmates' stories."

- **Complete Cool-Down** -

Response to Student Thinking

Students write a story that uses the values in the equation, but does not use problem structure that matches the operation in the equation.

Next Day Support

- Before the warm-up, pass back the cool-down and work in small groups to make corrections.

Lesson 13: Let's Solve Our Story Problems

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Represent and solve story problems.

Student-facing Learning Goals

- Let's solve, represent, and share story problems.

Lesson Purpose

The purpose of this lesson is for students to solve story problems and represent their thinking.

In the previous lesson, students created stories based on their observations. In this lesson, students solve their story problems and represent their work for others to see. Students take a gallery walk to see and compare the different stories and representations. They have an opportunity to revise their posters after the gallery walk. Throughout the lesson, students explain how they solved story problems and represented their thinking. Then they consider ways they can revise their explanations and representations for clarity (MP3, MP6).

Access for:

⬤ Students with Disabilities

- Engagement (Activity 2)

🌐 English Learners

- MLR7 (Activity 2)

Instructional Routines

Number Talk (Warm-up)

Materials to Gather

- Chart paper: Activity 1
- Colored pencils, crayons, or markers: Activity 1
- Sticky notes: Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

How did the gallery walk support continued learning and allow students to revise their thinking? What growth have you seen in your students this year in this area?

Cool-down (to be completed at the end of the lesson)   🕐 5 min

Represent Story Problems

Standards Alignments

Addressing   2.OA.A.1

Student-facing Task Statement

What did you learn while writing your story and looking at your classmates' stories?

Student Responses

Sample response:

My question was about how many more baseballs there were than footballs in the gym. I used subtraction to solve the problem. But it is also possible to add on to the number of footballs to solve the problem.

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Warm-up   🕐 10 min

Number Talk: Make a Ten

Standards Alignments

Addressing   2.NBT.B.5

The purpose of this Number Talk is to elicit strategies and understandings students have for adding within 100. Students may share how they use mental strategies to make a ten. When students share how they use the value of one expression to find the value of the next expression, they look for and express regularity in repeated reasoning (MP8).

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $38 + 7$
- $38 + 17$
- $38 + 27$
- $38 + 57$

Student Responses

- 45: I knew 7 is $2 + 5$ and 38 and 2 make 40 so 32 and 7 make 45.
- 55: I just added 10 to $38 + 7$.
- 65: I just added 10 to $38 + 17$.
- 95: I added 40 more to $38 + 17$.

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategies.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "What changes in the second, third, and fourth sums?" (the tens of the second number)
- "How does this help you calculate the third and fourth sums?" (I just add some more tens.)

Activity 1

🕐 20 min

Solve Story Problems

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to solve their story problems and represent one or more ways to solve the problem (MP2). As students work, encourage them to find a different way to solve the problem or a different way to represent the problem once they have completed a solution.

Materials to Gather

Chart paper, Colored pencils, crayons, or markers

Student-facing Task Statement

1. Solve the story problem you wrote yesterday.

2. Make a poster of your story problem. Make sure to include:

   - your story with the question
   - your thinking and reasoning to solve the problem, using:

     - pictures
     - diagrams
     - words
     - expressions

   - the answer to your story problem question

Student Responses

Sample response:

There were 86 kids and 27 adults in the race. How many more kids were there than adults?
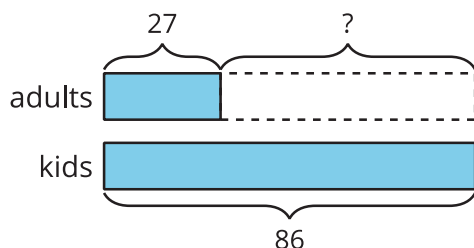
Launch

- Groups of 2
- Give students materials to make posters.

Activity

- "Today you are going to solve your story problem and then make a poster that shows your story problem and how you solved it."
- "If you have time, you can show different ways to solve the problem using pictures, words, or symbols."
- 10 minutes: independent work time
- "Share your poster with your partner and make revisions if needed."
- 5 minutes: partner discussion

Synthesis

- "In the next activity, you are going to look at the posters and leave comments."
- "What are some things that you will look for when you look at the posters?" (Do I understand the story? Do I agree with the solution? Can I follow the thinking or reasoning?)
- "What are some different ways you can show solutions to the problems?" (pictures of objects, base-ten pictures, diagrams,

$86 - 27 = ?$

$86 - 20 = 66$

$66 - 6 = 60$

$60 - 1 = 59$

There are 59 more kids than adults in the race.

number line diagrams, expressions, equations)

- "Keep an eye out for all of these representations and think about which ones you would choose if you were solving the problem."

Activity 2

🕐 15 min

Story Problem Gallery Walk

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to see the different story problem posters their classmates made. After the gallery walk, students have a chance to make revisions to their own posters. This could be making corrections, but it could also be adding new details or different representations based on what they learned from seeing the other posters. Some students might need guidance with asking mathematical questions or leaving feedback using precise math language (MP3, MP6).

Consider asking or displaying:

- "What is something you read or saw that helped you understand the story problem?"
- "What is something the writer could add or change to help make the problem more clear?"
- "What is something you saw that made it clear how the problem was solved?"
- "What is something that could be added or changed to make the writer's method more clear?"
- "What questions do you have about the story problem or the solution?"

The goal of the activity synthesis is to reflect on how the posters were the same and how they were different.

🌐 Access for English Learners

MLR7 Compare and Connect. Synthesis: After the Gallery Walk, lead a discussion comparing, contrasting, and connecting the different approaches to solving the problems. Ask, "What did the approaches have in common?", "How were they different?" To amplify student language and illustrate connections, follow along and point to the relevant parts of the displays as students speak.
Advances: Representing, Conversing

♿ Access for Students with Disabilities

Engagement: Provide Access by Recruiting Interest. Revisit math community norms to prepare students for the gallery walk. Give examples of appropriate comments and ways to agree or disagree with peers' work. Be sure students are ready for a whole-class discussion during the lesson synthesis as well.
Supports accessibility for: Social-Emotional Functioning, Attention

Materials to Gather

Sticky notes

Launch

- Groups of 2
- Display student posters on tables or walls.
- Give students access to sticky notes.

Activity

- "Walk around the room with your partner and look at the posters. Talk to your partner about what you notice and what you wonder."
- "Use your sticky notes to leave comments or questions about the stories and solutions, including things that helped you understand the problem and solutions and any other representations you might add to the poster."
- 7 minutes: partner work time
- "Make revisions to your own poster based on what you saw and discussed."
- 3 minutes: independent work time

- Monitor for students who may need questions or prompts to guide them with leaving feedback.

Synthesis

- "What did you change on your poster after seeing the other posters?" (Answers vary.)
- "If you had time, what other changes or additions would you make?"

Lesson Synthesis   ⏱ 10 min

"What are you most proud of that you learned in math this year? What are you most looking forward to learning in third grade?"

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Putting It All Together

Students put together their understanding from throughout the year to cap off major work and fluency goals of the grade.

Section A: Fluency Within 20

Students develop fluency with addition and subtraction within 20. One of the requirements in grade 2 is to have fluency with all sums and differences within 20, and know from memory all sums of 2 one-digit numbers. When students encounter sums and differences they do not know right away, they use mental math strategies and other methods they have learned throughout the year. They may use facts they know, make equivalent expressions, or compose or decompose a number to make a 10.

Students continue to apply their mental strategies as they find sums and differences within 20 in a measurement context. They measure lengths with standard units and create line plots, and then use the measurements to add and subtract.

|									
0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9
1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9
2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9
3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9
4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9
5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9
6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9
7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9
8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9
9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9

Section B: Numbers to 1,000

Students revisit numbers within 1,000 and focus on developing fluency with addition and subtraction within 100. They develop and show their understanding of place value and operations with larger numbers that may require composing or decomposing multiple units before focusing on fluency practice with numbers within 100.

Students practice decomposing and composing three-digit numbers in multiple ways using base-ten blocks, base-ten diagrams, words, and symbols. They also compose and decompose units as they match and create equivalent expressions for three-digit numbers. Students practice addition and subtraction within 1,000 and reason about which sums and differences are more or less difficult to solve.

263

$$2 \text{ hundreds} + 4 \text{ tens} + 23 \text{ ones}$$
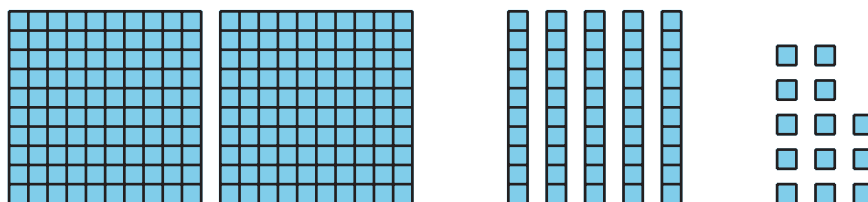
Section C: Create and Solve Story Problems

Students create and solve one- and two-step story problems with the unknown in all positions, discuss how they made sense of the problem, and share the strategies they used to solve.

At this point in the year, students should be able to solve all types of story problems within 100, using a representation that makes sense to them. Students make connections across representations with a focus on tape

diagrams and equations. They analyze stories and determine the types of questions that could be asked based on the provided information, in preparation for writing their own story problems based on images and their own experiences. The lessons offer space for students to apply their fluency with addition and subtraction within 100, as they engage with the story problems in this section.

How many books in all?

$$33 + 18 = ?$$
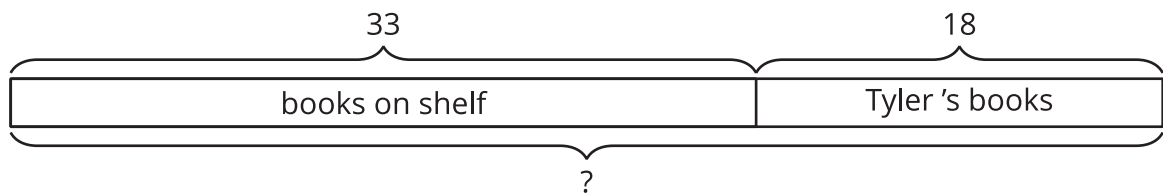
Try it at home!

Near the end of the unit, ask your student:

- Using our favorite objects from home, let's make different types of story problems.
- What kinds of questions can you ask?

Questions that may be helpful as they work:

- What part of the story problem are we trying to find out? How could we solve the problem?
- How could you represent the problem with a diagram?

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Unit Assessments

End-of-Course Assessment and Resources

Putting It All Together: End-of-Course Assessment and Resources

1. Select **3** representations of 352.

   A. $300 + 20 + 5$
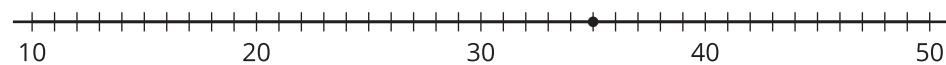
   B. Three-hundred-twenty-five

   C.
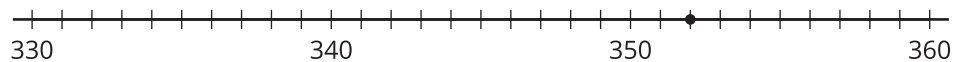
   D. Three-hundred-fifty-two

   E.

   F. $300 + 50 + 2$

2. Fill in each blank with $<$, $=$, or $>$ to make the statements true.

   a. 675 _____ 576

   b. 98 _____ 205

   c. $500 + 40 + 3$ _____ 543

   d. 675 _____ $600 + 70 + 1$

3. If you skip count from 0 to 500 by 10s, which of these numbers will you say as you count?

    A.   150

    B.   275

    C.   300

    D.   480

    E.   540

4. How many centimeters longer is the rectangle on top than the rectangle on bottom? Explain or show your reasoning.

5. Select **2** true statements about the measurements of the length of a school hallway.

    A. The length of the school hallway is about 50 feet.

    B. The length of the school hallway is about 50 centimeters.

    C. The length of the school hallway is about 50 inches.

    D. It takes more meters than inches to measure the hallway.

    E. It takes more centimeters than feet to measure the hallway.

    F. It takes the same number of feet and inches to measure the hallway.

6. Clare made a necklace that is 74 cm long. She made a bracelet that is 28 cm long. How many centimeters longer is the necklace than the bracelet? Show your thinking using drawings, numbers, or words.

7. a. Locate and label 25 and 52 on the number line.
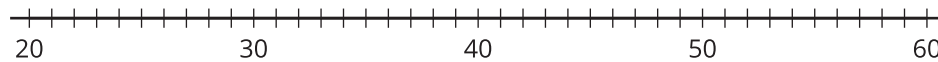
b. Find the value of $52 - 25$. Explain or show your reasoning.

8. Diego has 34 cents. Mai has 19 more cents than Diego. How many cents do Mai and Diego have together? Explain or show your reasoning.

9. Find the value of each expression. Show your thinking.

    a. $347 + 583$

    b. $612 - 174$

10. Here is how Mai found $831 - 596$.

$831 - 600 = 231$

$231 + 4 = 235$

$831 - 596 = 235$

Explain why Mai's strategy works.

_____

_____

_____

11. Find the value of each expression. Show your thinking.

    a. $564 + 231$

    b. $564 - 231$

    c. $427 + 392$

    d. $352 - 146$

12. Find the value of each expression.

    a. $9 + 8$

    b. $16 - 9$

    c. $55 + 16$

    d. $73 - 8$

13. Here are 4 digits:

$$1 \qquad 4 \qquad 8 \qquad 5$$

    a. Make 2 two-digit numbers with these digits and find the value of their sum and difference.

    b. What is the biggest sum you can make?

c. What is the smallest sum you can make?

d. What is the biggest difference you can make?

e. What is the smallest difference you can make?

14. Tyler's class made lei necklaces. The line plot shows the length of some of the lei necklaces.
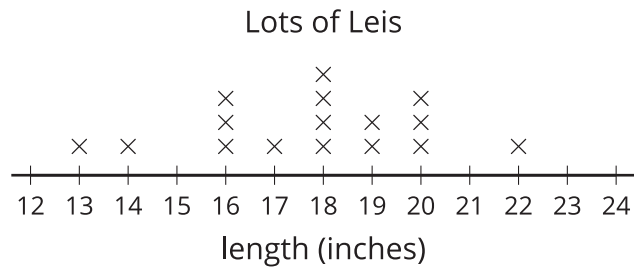
Lots of Leis

length (inches)

a. How many necklaces are 20 inches or longer?

b. What is the difference between the longest and shortest lei?

c. Tyler, Clare, and Andre have not added their necklace lengths yet. Their lei lengths are different from each other and from all of the other leis. What is one possibility for the sum of Tyler, Clare, and Andre's leis? Explain or show your reasoning.

d. The sum of Tyler, Clare, and Andre's lei lengths is 60 inches. What are their lei lengths? Explain or show your reasoning.

e. Use Tyler, Clare, and Andre's lei lengths to complete the line plot.

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Assessment
Answer Keys

End-of-Course Assessment and Resources

Assessment Answer Keys
Assessment: End-of-Course Assessment and Resources

Teacher Instructions

The items here focus on major work of the grade, fluencies of the grade, and also include at least one in-depth problem that provides a context where students apply key ideas they have learned over the year. The items included here can be used prior to the final unit to focus remaining time in the year or to assess student understanding at the end of the year. It is not recommended that these resources be used all at once.

Give students access to centimeter rulers.

Problem 1

Standards Alignments

Addressing   2.MD.B.6, 2.NBT.A.1, 2.NBT.A.3
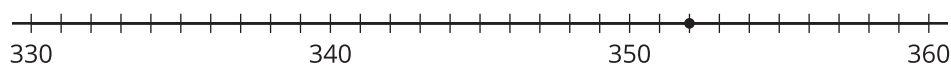
Narrative

Students choose different representations of a number within 1,000. For each representation, expanded form, number line, and word form, one correct representation is accompanied by one incorrect representation. In all cases, the incorrect representations confuse place value of one or more digits in the number.

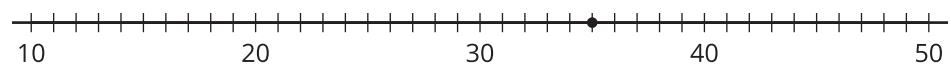Select **3** representations of 352.

A. $300 + 20 + 5$

B.   Three-hundred-twenty-five

C.

D.   Three-hundred-fifty-two

E.

F. $300 + 50 + 2$

Solution

["C", "D", "F"]

Problem 2

Standards Alignments

Addressing   2.NBT.A.1, 2.NBT.A.3, 2.NBT.A.4

Narrative

Students compare numbers within 1,000 using $<$, $=$, and $>$. Some of the numbers are given in expanded form while the others are given as numbers. Students who answer the first two problems correctly but not the second two probably need more work with expanded form while students who struggle with all of the items need further work with place value.

Fill in each blank with $<$, $=$, or $>$ to make the statements true.

   a. 675 _____ 576
   b. 98 _____ 205
   c. $500 + 40 + 3$ _____ 543
   d. 675 _____ $600 + 70 + 1$

Solution

   a. $>$
   b. $<$
   c. $=$
   d. $>$

Problem 3

Standards Alignments

Addressing   2.NBT.A.2

Narrative

Students identify numbers that appear on a list when counting from 0 by tens. Students who select B may be thinking of counting by fives. Students who select E have likely not read the question carefully as 540 would appear on a list of numbers counting by tens but it is larger than 500.

If you skip count from 0 to 500 by 10s, which of these numbers will you say as you count?

    A.   150

    B.   275

    C.   300

    D.   480

    E.   540

Solution

["A", "C", "D"]

Problem 4

Standards Alignments

Addressing   2.MD.A.1, 2.MD.A.4

Narrative

Students measure the lengths of two figures and find how much longer one is than the other. Students may incorrectly measure one or both of the lengths and correctly find the difference. These students need more work using rulers to measure lengths of objects. Students require a centimeter ruler to complete this problem.

How many centimeters longer is the rectangle on top than the rectangle on bottom? Explain or show your reasoning.

Solution

7 cm. The long rectangle is 15 cm and the short one is 8 cm. $15 - 8 = 7$.

Problem 5

Standards Alignments

Addressing   2.MD.A.2, 2.MD.A.3

Narrative

Students estimate the length of a school hallway, choosing between 3 measurements only one of which is reasonable. They then select one correct statement about measuring the hallway using different units. If students select D they are probably thinking that a meter is more than an inch and do not realize this means it takes fewer meters to measure the hallway.

Select **2** true statements about the measurements of the length of a school hallway.

A. The length of the school hallway is about 50 feet.

B. The length of the school hallway is about 50 centimeters.

C. The length of the school hallway is about 50 inches.

D. It takes more meters than inches to measure the hallway.

E. It takes more centimeters than feet to measure the hallway.

F. It takes the same number of feet and inches to measure the hallway.

Solution

["A", "E"]

Problem 6

Standards Alignments

Addressing   2.MD.B.5, 2.OA.A.1

Narrative

Students solve a compare story problem about lengths. They may draw a number line, a base-ten representation, or use equations as in the provided solution. Students may misread the question and add 74 and 28. These students may need more practice interpreting stories.

Clare made a necklace that is 74 cm long. She made a bracelet that is 28 cm long. How many centimeters longer is the necklace than the bracelet? Show your thinking using drawings, numbers, or words.

Solution

46 cm
$28 + 2 = 30$
$30 + 40 = 70$
$74 + 4 = 74$
$40 + 4 + 2 = 46$

Problem 7

Standards Alignments

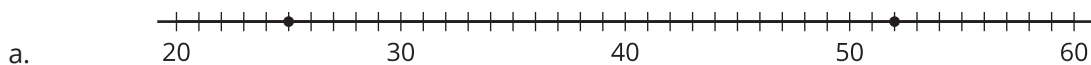Addressing   2.MD.B.6

Narrative

Students locate two numbers on the number line and then find their difference. While students do not need to use the number line to find the difference, it provides a useful tool as students can visualize the 2 tens and 7 ones between the 25 and 52 using the structure of the number line.
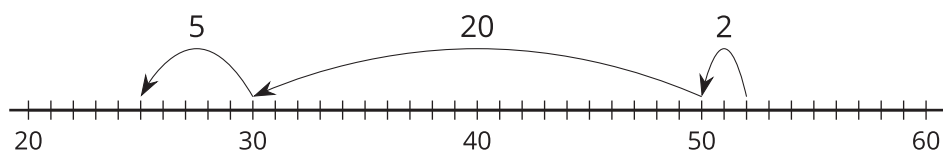
a. Locate and label 25 and 52 on the number line.

b. Find the value of $52 - 25$. Explain or show your reasoning.

Solution

a.
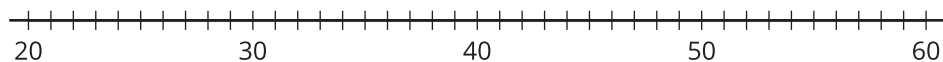
b. 27, first I went back 2 to 50 then back 20 more to 30 and then 5 more to 25 and that was 27 altogether.

Problem 8

Standards Alignments

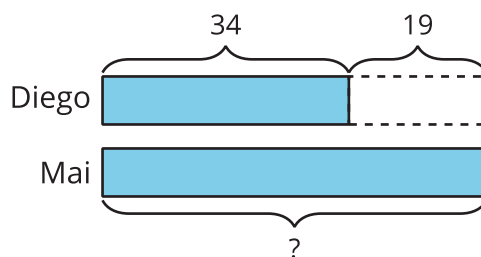Addressing   2.NBT.B.5, 2.OA.A.1

Narrative

Students solve a two part story problem where both operations are addition. They may draw a tape diagram to keep track of the numbers and help them organize the information. They may write equations or use a number line or place value reasoning to perform the arithmetic. If students calculate how many cents Mai has incorrectly, their final answer should be evaluated based on the incorrect number for Mai.

Diego has 34 cents. Mai has 19 more cents than Diego. How many cents do Mai and Diego have together? Explain or show your reasoning.

Solution

87 cents. Sample response: Mai has $34 + 19$ cents. I added 34 and 19 and that's 53 because $34 + 20$ is 54 and 19 is 1 less than 20. Then I found $34 + 53$ and I could just add tens and ones to get 87.

Sample representation:

Problem 9

Standards Alignments

Addressing   2.NBT.B.7

Narrative

Students perform addition and subtraction within 1,000. Both problems require composing or decomposing hundreds and tens if the operations are performed by place value. Other problems requiring fewer compositions or decompositions are presented in a different item in order to identify if students struggle with this place value understanding.

Find the value of each expression. Show your thinking.

    a. $347 + 583$

    b. $612 - 174$

Solution

    a. 930
       $300 + 500 = 800$
       $40 + 80 = 120$
       $7 + 3 = 10$
       $800 + 120 + 10 = 930$

    b. 438
       $612 - 100 = 512$
       $512 - 70 = 442$
       $442 - 4 = 438$

Problem 10

Standards Alignments

Addressing   2.NBT.B.9

Narrative

Students explain why a compensation method for subtraction works. In this case, subtracting by place value would mean decomposing a ten and decomposing a hundred. Instead, subtracting 600 and then adding back 4 gets the same result with no decomposition. Students may explain why the method works in words, with equations or by using a number line.

Here is how Mai found $831 - 596$.

$831 - 600 = 231$

$231 + 4 = 235$

$831 - 596 = 235$

Explain why Mai's strategy works.

Solution

Mai's strategy works because 600 and 596 are close together, just 4 apart. She took away 600 because she could just take 6 hundreds from the 8 hundreds. But then she had to add 4 back because taking away 600 took away 4 too many.

Problem 11

Standards Alignments

Addressing   2.NBT.B.7

Narrative

Students calculate sums and differences within 1,000. They are not required to show their thinking so this item addresses fluency. The first two items require no composition or decomposition of new units when adding or subtracting by place value. The next two items each require one composition or decomposition when adding or subtracting by place value.

Find the value of each expression. Show your thinking.

   a. $564 + 231$
   b. $564 - 231$
   c. $427 + 392$
   d. $352 - 146$

Solution

   a. 795
   b. 333
   c. 819
   d. 206

Problem 12

Standards Alignments

Addressing   2.NBT.B.5, 2.OA.B.2

Narrative

Students find sums and differences within 100. No explanation is required as this item is assessing fluency. Each problem requires composing or decomposing a ten if students perform operations by place value but other methods are available such as using a number line.

Find the value of each expression.

    a. $9 + 8$

    b. $16 - 9$

    c. $55 + 16$

    d. $73 - 8$

Solution

    a. 17

    b. 7

    c. 71

    d. 65

Problem 13

Standards Alignments

Addressing   2.NBT.B.5

Narrative

Students add and subtract two-digit numbers. They make the two-digit numbers using 4 given digits and then strategically think about how to make the biggest and smallest sum and difference. In each case, they will need to experiment and think about place value.

This work can be repeated with any 4 digits. For example, students can use Number Cards 0-10 (without the 10 card) and pick 4 cards to give 4 digits. Playing several rounds gives students practice with addition and subtraction while also allowing them to identify patterns and strategies for getting the largest and smallest sums and differences.

Here are 4 digits:

<div align="center">

1   4   8   5

</div>

a. Make 2 two-digit numbers with these digits and find the value of their sum and difference.

b. What is the biggest sum you can make?

c. What is the smallest sum you can make?

d. What is the biggest difference you can make?

e. What is the smallest difference you can make?

Solution

a. Sample response: $14 + 85 = 99$ and $85 - 14 = 71$.

b. $84 + 51 = 135$

c. $18 + 45 = 63$

d. $85 - 14 = 71$

e. $51 - 48 = 3$

Problem 14

**Standards Alignments**

Addressing   2.MD.D.9, 2.NBT.B.5, 2.OA.A.1

Narrative

Students read a line plot and then complete the line plot based on given information. To complete the line plot they will need to use a lot of trial and error, which will give them practice with adding two-digit numbers, or think strategically about the value of the sum they need. One way to solve the problem without trial and error is provided in the solution, namely by thinking about the ones. The ones of the missing numbers on the line plot are not large enough to make 2 tens so the only way to get 60 as a sum is if the ones of the three numbers add up to exactly 10. There are two sets of numbers like this, one of them gives the desired result of 60 and the other gives 70 as a sum.

Tyler's class made lei necklaces. The line plot shows the length of some of the lei necklaces.
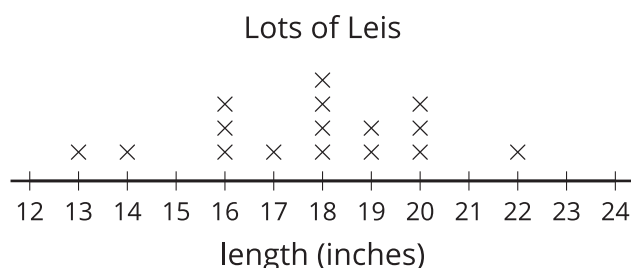
Lots of Leis

length (inches)

a. How many necklaces are 20 inches or longer?

b. What is the difference between the longest and shortest lei?

c. Tyler, Clare, and Andre have not added their necklace lengths yet. Their lei lengths are different from each other and from all of the other leis. What is one possibility for the sum of Tyler, Clare, and Andre's leis? Explain or show your reasoning.

d. The sum of Tyler, Clare, and Andre's lei lengths is 60 inches. What are their lei lengths? Explain or show your reasoning.

e. Use Tyler, Clare, and Andre's lei lengths to complete the line plot.

Solution

a. 4

b. 9 inches. $22 - 13 = 9$

c. Sample response: They could be 12 inches, 15 inches, and 21 inches. That would add up to 48 inches since there are 4 tens and 8 ones altogether.

d. Sample response: They need to be longer than the ones I chose. I tried adding the 3 longest missing lei lengths and that was too much, 68 inches. I know there are no ones in 60 so the ones of the 3 numbers will add up to 10. I used 15, 21, and 24 and they add up to 60.

Lots of Leis

length (inches)

e.

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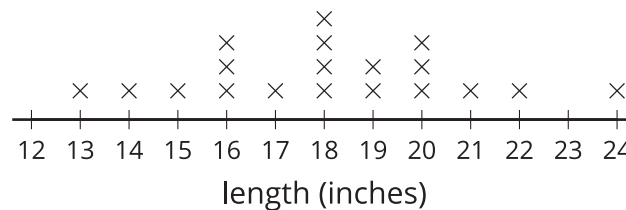
Lesson
Cool Downs

Lesson 1: Sums and Differences Within 20

Cool Down: Add and Subtract with Fluency

Find the value of each expression.

1. $11 - 5$

2. $12 - 3$

3. $16 - 8$

4. $9 + 3$

5. $8 + 8$

6. $13 - 8$

Lesson 2: Fluency Flip

Cool Down: Just the Facts

Explain how you can use facts you know to find the value of sums and differences you don't know right away.

_____

_____

_____

Lesson 3: Measure on a Map

Cool Down: Practice Facts

Review the cards you made in the first lesson.

1. Which sums do you know now that you didn't before?

_____

_____
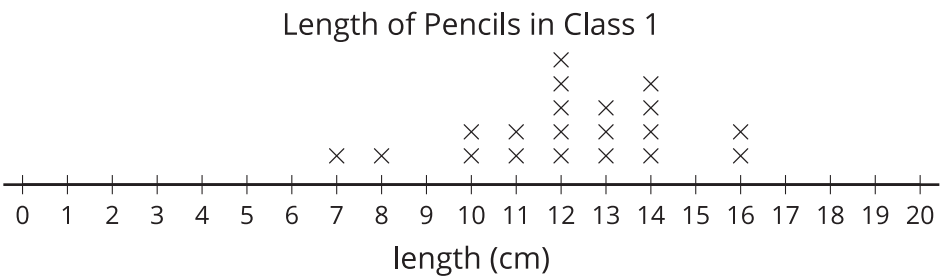
_____

2. What helped you remember the sum?

_____

_____

_____

Lesson 4: Measure and Plot

Cool Down: Supply Request

1. What is the difference between the shortest and longest pencil in Class 1?

Length of Pencils in Class 1

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

length (cm)

Write an equation to represent the difference.

2. What is the difference between the shortest and longest pencil in Class 2?

Length of Pencils in Class 2

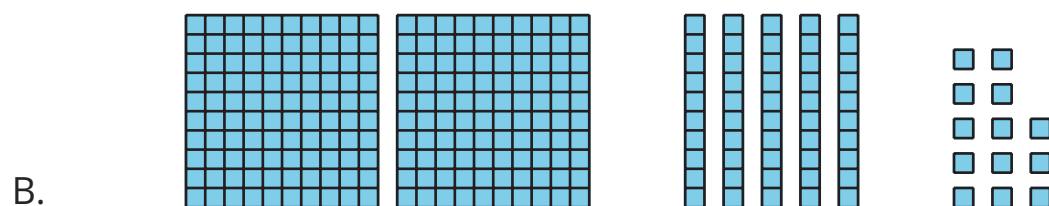0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
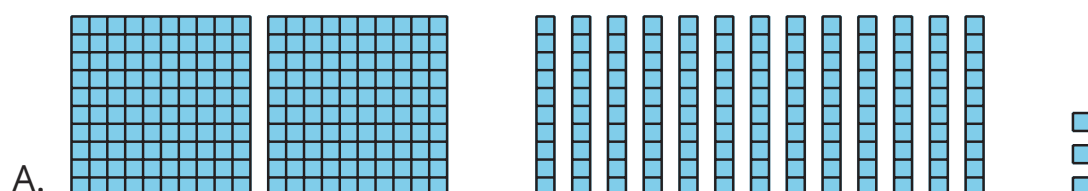
length (cm)
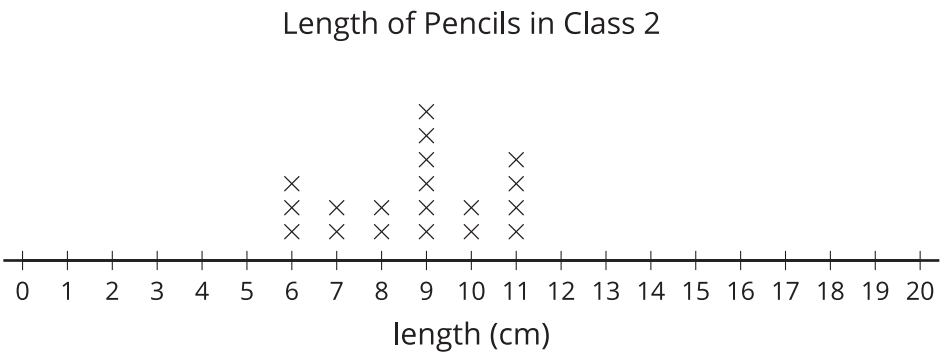
Write an equation to represent the difference.

Lesson 5: Compose and Decompose Numbers Within 1,000

Cool Down: Two Hundred Sixty-Three

1. Circle the representations that show 263.

A.

B.

C. 2 hundreds + 4 tens + 23 ones

2. Represent 263 in a different way.

Lesson 6: Represent Numbers with Expressions

Cool Down: Think of a Time

Prepare to discuss a time when representing 241 as 2 hundreds, 3 tens, and 11 ones might be helpful.

Lesson 7: Add and Subtract Within 1,000

Cool Down: Add and Subtract Within 1,000

1. Find the value of each expression.

   a.

   84 − 22

   b.

   504 + 183

   c.

   56 + 27

2. Which value was the most challenging to find? Explain.

   _____

   _____

   _____

Lesson 8: Add and Subtract Within 100

Cool Down: Practice for Fluency

How have you improved with adding and subtracting within 100?

_____

_____

_____

What do you still want to work on?

_____

_____

_____

Lesson 9: Sort the Story Problems

Cool Down: Book Donations

Jada's class gave away 19 books. Her class gave away 5 fewer books than Diego's class. How many books did Diego's class give away?

Show your thinking using diagrams, symbols, or other representations.

Lesson 10: What's the Question?

Cool Down: Ask It and Answer It

Tyler put 26 apples into his basket. Clare put 35 apples into her basket.

Ask and answer a math question about this situation.

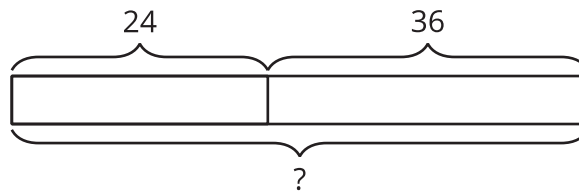_____

_____

_____

Lesson 11: All About Tape Diagrams

Cool Down: What's the Story?

Write and solve a story problem that the diagram could represent.

Lesson 12: What's the Story?

Cool Down: What Could the Question Be?

Tyler writes the equation $24 + 37 = 61$ to answer a question about the picture.

Write a story problem with a question that Tyler's equation could answer.

_____

_____

_____

Lesson 13: Let's Solve Our Story Problems

Cool Down: Represent Story Problems

What did you learn while writing your story and looking at your classmates' stories?

_____

_____

_____

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Instructional
Masters

Instructional Masters for Putting It All Together

address	title	students per copy	written on?	requires cutting?	card stock recommended?	color paper recommended?
Activity Grade2.9.9.1	Card Sort Story Problems	1	no	yes	no	no
Activity Grade2.9.11.1	Represent Story Problem Cards	2	no	yes	no	no
Activity Grade2.9.2.2	Number Mix Up	1	no	no	no	no
Activity Grade2.9.6.2	Match Expressions Cards 2.9	2	no	yes	no	no
Activity Grade2.9.2.1	Number Cards 0-19	2	no	yes	yes	no
Activity Grade2.9.12.2	Story Photos	2	no	yes	no	no
Activity Grade2.9.3.1	Measurement Map	1	yes	no	no	no
Activity Grade2.9.8.1	Heads Up - Add and Subtract within 100 Number Cards	2	no	yes	no	no
Activity Grade2.9.1.2	Spin and Find the Missing Number Spinners	2	no	no	no	no
Center	Five in a Row Addition and Subtraction Stage 6 Gameboard	2	no	no	no	no
Center	Target Numbers Stage 3 Recording Sheet	1	yes	no	no	no
Center	Target Numbers Stage 4 Recording Sheet	1	yes	no	no	no
Center	Target Numbers Stage 5 Recording Sheet	1	yes	no	no	no

Card Sort Story Problems

Jada has a pile of 92 books. She put them in stacks of 10. She gave Andre 3 stacks of books. Then she gave him 5 more books.

How many books does Jada have now?

Tyler put 15 books on the library cart. Lin put 18 books on the cart. Noah took 7 books off the cart.

How many books are on the cart now?

On Monday, Elena's class sorted 47 books. On Tuesday, they sorted 15 books. On Wednesday, they sorted 18 books.

How many books have they sorted altogether?

Lin and Tyler have 73 books to sort. Lin has put 28 in the "keep" pile for her class. Tyler has put 17 in the "keep" pile for his class.

How many books will they have for the "give away" pile?

Last summer, Clare read 14 books. Clare read 5 fewer books than Lin.

How many books did Clare and Lin read together last summer?

There were some books on the shelf. Tyler took 18 books off the shelf and now there are 33 books on the shelf.

How many books were on the shelf to start with?

Represent Story Problem Cards

There are 53 baseballs in a box. There are 25 fewer tennis balls than baseballs in the box. How many tennis balls are in the box?

Jada collected some pine cones in the park. Han took 25 of Jada's pine cones and 53 pine cones were left. How many pine cones did Jada collect?

There are 12 pattern blocks in a bag. There are 6 more pattern blocks on the table than in the bag. Jada puts 9 more pattern blocks on the table. How many pattern blocks are on the table now?
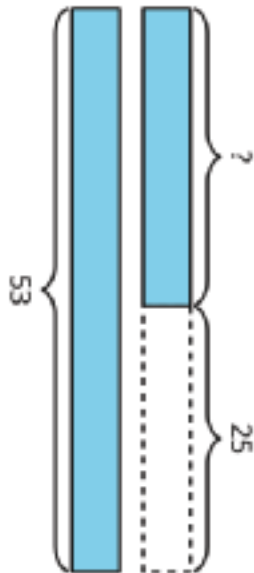
There are 12 puzzle pieces in the box. Diego puts 6 more puzzle pieces in the box. There are 9 more puzzle pieces in the box than there are on the table. How many puzzle pieces are on the table?
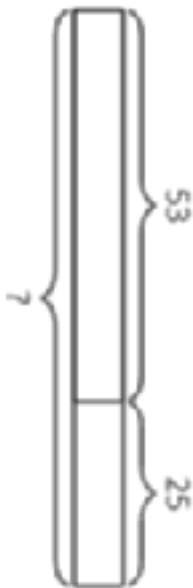
E - Represent Story Problems

F - Represent Story Problems

G - Represent Story Problems
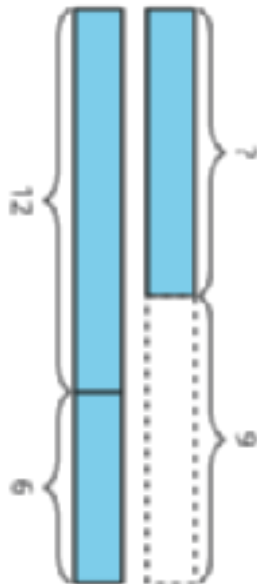
H - Represent Story Problems

I - Represent Story Problems

$$? - 25 = 53$$

J - Represent Story Problems

$$12 + 6 + 9 = ?$$

K - Represent Story Problems

$$? + 25 = 53$$

L - Represent Story Problems

$$12 + 6 - 9 = ?$$

$$6 = \boxed{} + \boxed{}$$

$$6 = \boxed{} + \boxed{}$$

$$6 = \boxed{} - \boxed{}$$

$$6 = \boxed{} - \boxed{}$$

$$6 = \boxed{} - 2$$

$$6 = \boxed{} - 1$$

$7 = \square + \square$

$7 = \square + \square$

$7 = \square - 2$

$7 = \square - 1$

$7 = \square + \square$

$7 = \square - \square$

11 = ☐ + ☐

11 = ☐ + ☐

11 = ☐ + 1 + ☐

11 = 11 − ☐ = ☐ + ☐

leftover

14 = [ ] + [ ]

14 = [ ] + [ ]

14 = 8 + [ ] + [ ] + [leftover]

14 = 7 + [ ]

14 = 10 + [ ]

A

$$300 + 50 + 15$$

B

$$600 + 20 + 1$$

C

$$200 + 130 + 25$$

D

$$600 + 120 + 21$$

E

6 hundreds + 12 tens + 21 ones

F

3 hundreds + 4 tens + 25 ones

5 hundreds + 12 tens + 1 one

3 hundreds + 3 tens + 25 ones

$600 + 140 + 1$

$300 + 50 + 5$

$200 + 150 + 15$

$500 + 100 + 21$

0	1	2	3	4
5	<u>6</u>	7	8	<u>9</u>
10	11	12	13	14
15	16	17	18	19
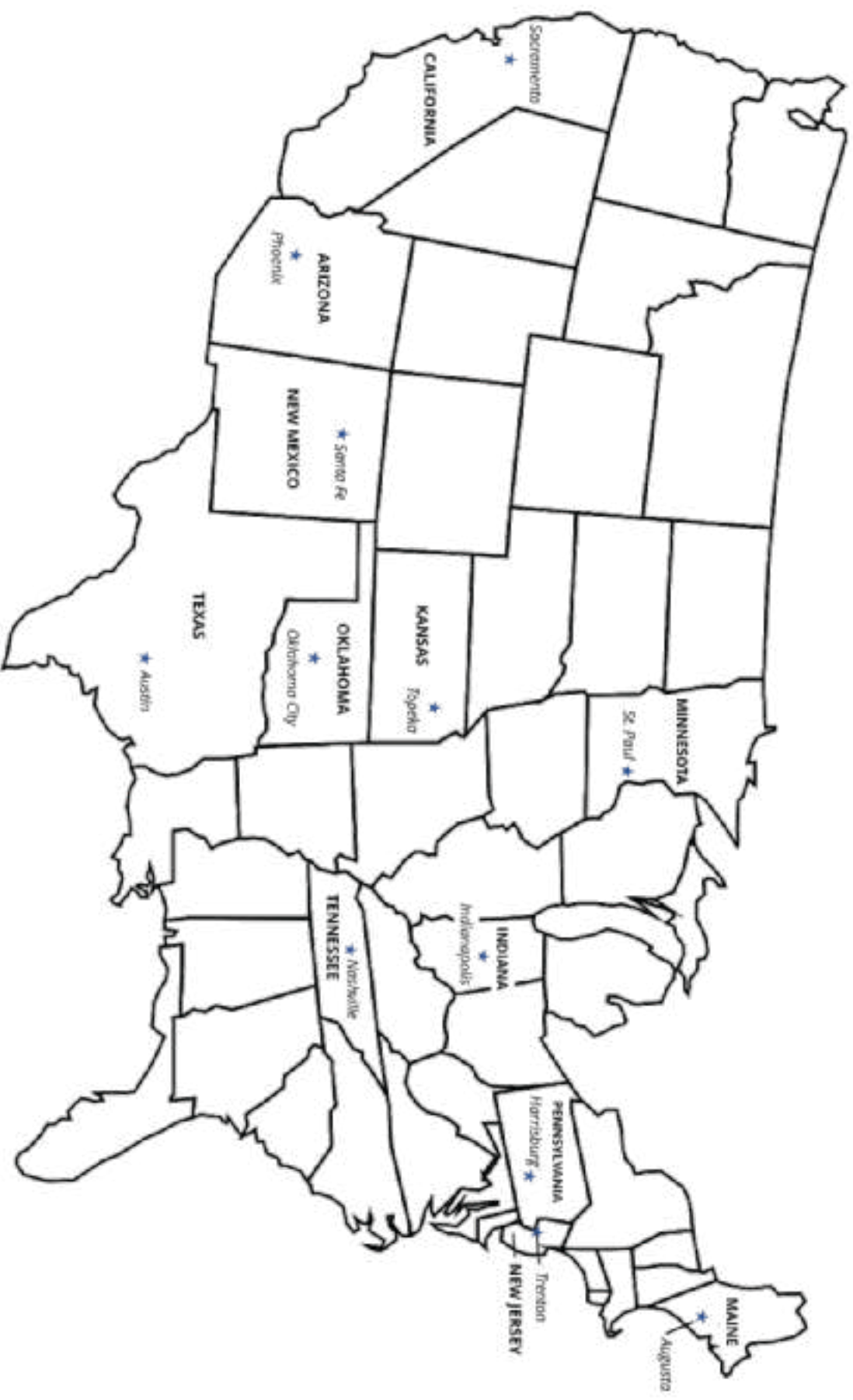
Heads Up

39

Heads Up

48

Heads Up

15

Heads Up

20

Heads Up

17

Heads Up

26

Heads Up

32

Heads Up

45

Heads Up

7

Heads Up

14

Heads Up

33

Heads Up

62

Heads Up

53

Heads Up

41

Heads Up

29

Heads Up

8

Heads Up

66

Heads Up

10

Heads Up

37

Heads Up

46

Heads Up

9

Heads Up

57

Heads Up

24

Heads Up

74

Spin and Find the Missing Number Spinners
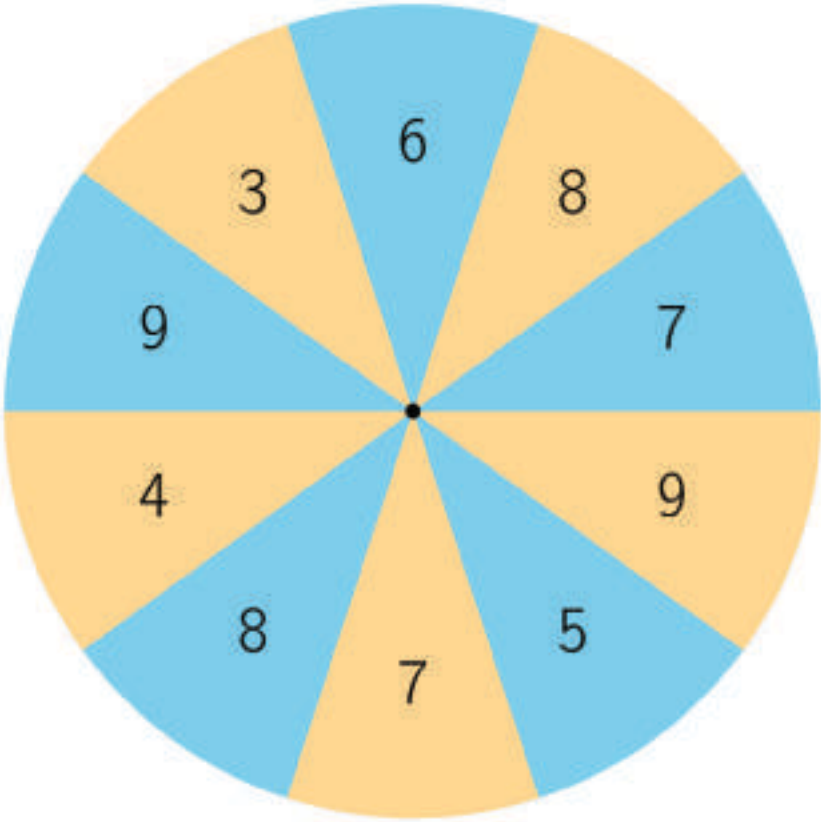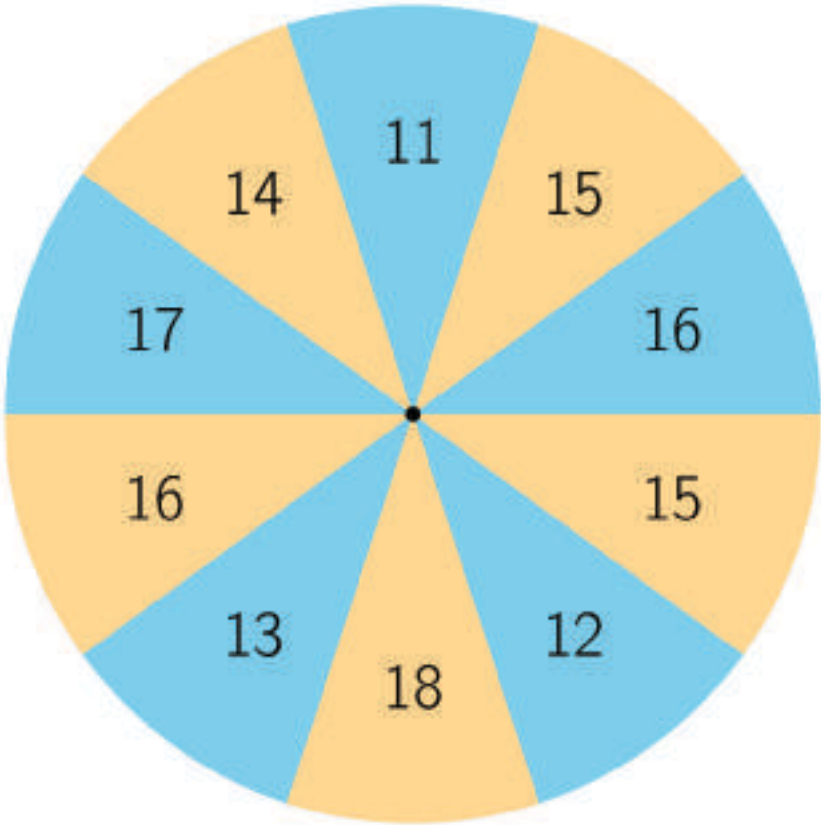
Five in a Row Addition and Subtraction Stage 6 Gameboard

Directions: (two-digit plus two-digit)
- Partner A: Put a paper clip on 2 numbers in the grey rows. Cover the sum of the 2 numbers with a counter.
- Partner B: Move 1 of the paper clips, add the numbers, and cover the sum with a counter.
- Take turns. The first partner to cover 5 squares in a row wins.

81	91	54	46	90
84	83	35	82	53
60	92	99	73	51
73	42	44	53	92
100	75	82	61	64

16	27	25	34	35
65	19	57	26	48

Five in a Row Addition and Subtraction Stage 6 Gameboard

Directions: (one-digit plus two-digit)
- Partner A: Put a paper clip on 2 numbers in the grey rows. Cover the sum of the 2 numbers with a counter.
- Partner B: Move 1 of the paper clips, add the numbers, and cover the sum with a counter.
- Take turns. The first partner to cover 5 squares in a row wins.

75	64	24	26	63
65	25	22	31	55
58	30	67	32	66
72	56	54	34	71
74	23	33	73	57

5	6	7	8	9
17	25	49	58	66

Directions:
- On your turn:
  - Roll 2 cubes to get your starting number
  - Roll 3 cubes. Choose one number to represent the tens and one number to represent the ones you will add.
  - Write an equation to represent the sum.
- Take turns until you've played 6 rounds.
- Each round, the sum from the previous equation is the starting number in the new equation.
- The partner who gets a sum closest to 95 without going over wins.

roll and choose	equation
_____ **tens** _____ **ones**	_____ + _____ = _____
_____ **tens** _____ **ones**	_____ + _____ = _____
_____ **tens** _____ **ones**	_____ + _____ = _____
_____ **tens** _____ **ones**	_____ + _____ = _____
_____ **tens** _____ **ones**	_____ + _____ = _____
_____ **tens** _____ **ones**	_____ + _____ = _____

Target Numbers Stage 4 Recording Sheet

Directions:
- On your turn:
  - Start at 100. Draw a number card. Choose whether to subtract that number of tens or ones.
  - Write an equation to represent the difference.
- Take turns until you've played 6 rounds.
- Each round, the difference from the previous equation is the starting number in the new equation.
- The partner who gets a difference closest to 0 without going below 0 wins.

number card	choose	equation
	tens or **ones**	100 − _____ = _____
	tens or **ones**	_____ − _____ = _____
	tens or **ones**	_____ − _____ = _____
	tens or **ones**	_____ − _____ = _____
	tens or **ones**	_____ − _____ = _____
	tens or **ones**	_____ − _____ = _____

Target Numbers Stage 5 Recording Sheet

Directions:
- On your turn:
  - Start at 100. Roll 3 number cubes. Pick 1 number to represent the tens and 1 number to represent the ones.
  - Subtract the number you chose.
  - Write an equation to represent the difference.
- Take turns until you've played 6 rounds.
- Each round, the difference from the previous equation is the starting number in the new equation.
- The partner who gets a difference closest to 0 without going below 0 wins.

roll and choose	equation
_____ tens _____ ones	100 − _____ = _____
_____ tens _____ ones	_____ − _____ = _____
_____ tens _____ ones	_____ − _____ = _____
_____ tens _____ ones	_____ − _____ = _____
_____ tens _____ ones	_____ − _____ = _____
_____ tens _____ ones	_____ − _____ = _____

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