Illustrative Mathematics®

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GRADE 3

Unit

3

Teacher Adaptation Pack

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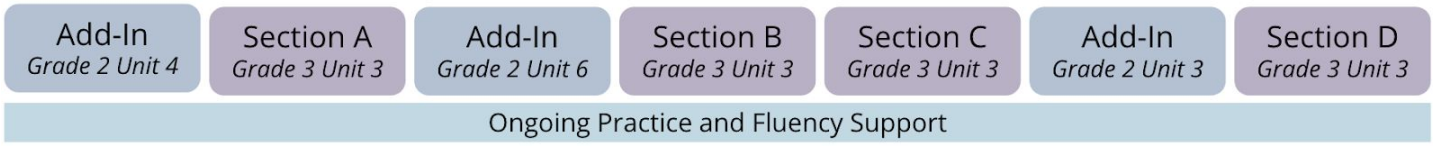
K5_Beta

Grade 3 Unit 3 Teacher Adaptation Pack

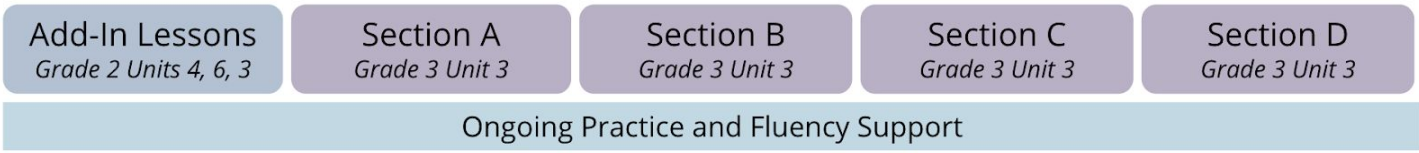
Directions for Use

1. Read the current grade level unit standards and dependencies.
2. Ask prior grade level teachers if students were taught the topics when school was in physical session last year. Another option is to show the students a problem on the topic and anonymously ask students if they know how to solve the problem.
    a. If yes, start the current grade level section without the add-in lessons.
    b. If not, teach the prior grade level add-in lessons.
3. After the add-in lessons, give the mini-assessment.
    a. If students got the questions correct, start the current grade level section.
    b. If students got some things correct, start the current grade level section, but use the ongoing practice materials to support students.

Recommended Implementation



Alternate Implementation



Grade 3 Unit 3: Wrapping up 1,000			
	Section A	**Section B,C**	**Section D**
Standards	3.NBT.A.2, 3.OA.D.9	3.NBT.A.2	3.NBT.A.1, 3.OA.D.8
Prior-Grade Connections	2.NBT.A.1, A2, A3	2.NBT.B.5, 2.NBT.B7	2.MD.B.6
Rationale	In Section A, students revisit concepts of place value for numbers within 1,000 and look for patterns in arithmetic. This section sets the foundation for the rest of the work of the unit which requires deep understanding of place value understanding in order to add and subtract. For this reason, lessons from grade 2 are recommended to use instead of this section. In Section B and C, students build on grade 2 work with addition and subtraction within 1,000 to use strategies and algorithms to develop fluency with addition and subtraction. Students have added when composing a new unit is required since Grade 1, so the suggested add-in lessons focus on decomposing to subtract. In Section D, students build on work with the number line to round numbers and solve two-step problems involving addition, subtraction and multiplication.		
Add-in Lessons	Before Section A: • 2.4 Lesson 8 • 2.4 Lesson 9 • 2.4 Lesson 10 • 2.4 Lesson 12 • 2.4 Lesson 13	Before Section B and C: • 2.6 Lesson 14 • 2.6 Lesson 16	Before Section D: • 2.3 Lesson 2
3.3 Lessons to Combine or Skip	Skip: • Section A: Lessons 1-3		
Prior-grade Practice and Fluency	• Grade 2 Addition and Subtraction within 100 Number Talks • How Close, Stages 1-3 • What's Behind My Back, Stage 4 • Number Puzzles, Stage 2-3		

	• Less than 10, Stage 1-2		
Extension and Exploration	• IM Task: Classroom Supplies • 2.8 Lessons 5, 6 and 9		
Assessment	Mini-Assessment 1 If students need Ongoing Practice • Matching Representations • What's My Number?	Mini-Assessment 2 If students need Ongoing Practice • 2.8 Lesson 7	Mini-Assessment 3 If students need Ongoing Practice • Number Line, Fill It

Table of Contents

2.4 Lesson 8: Making Multiples of 100

Teacher-facing Learning Goals

- Understand that a hundred is composed of 10 tens.
- Write multiples of 100 as three-digit numbers.

Addressing CCSS: 2.NBT.A.1.A. 2.NBT.A.1.B, 2.NBT.A.2

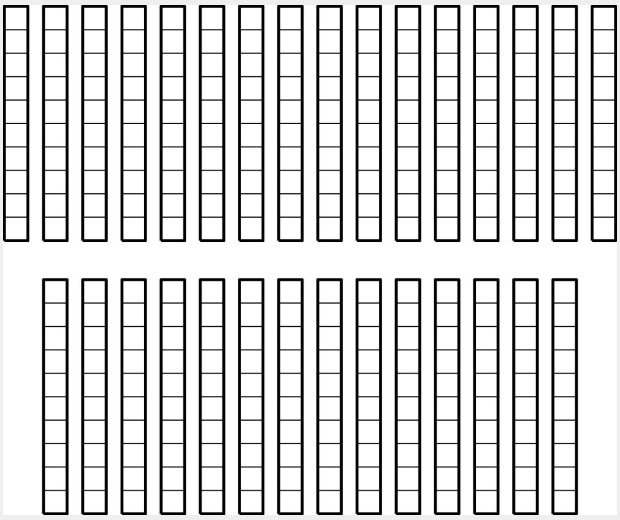
Lesson Purpose

The mathematical purpose of this lesson is for students to continue working with a hundred. Students make hundreds by grouping tens, and then represent the same quantity using hundreds.

Materials Needed

Gather	**Copy**
• at least 50 ten blocks, for each group of 4 students • display Image (Activity 1)	• none

Cool-down: How Many?



1. How many?

2. Write the total as a three-digit number._____

Student Responses

1. Answers vary. Sample response: 3 hundreds, 30 tens
2. 300

Teacher Reflection Question

During group work, whose voice was heard? How do you know? What norms or routines allowed those students to engage in the mathematics? How can you adjust these norms and routines so all students are heard tomorrow?

Lesson Narrative

In a previous lesson, students learned that a hundred is composed of 10 tens or 100 ones.

The **purpose** of this lesson is to introduce multiples of 100. Students learn that for every 10 tens, they can use 1 hundred and easily count the number of hundreds. Students begin to understand the repetitive pattern in the structure of the base-ten system. They recognize that 10 tens make 1 hundred, 30 tens make 3 hundreds, 60 tens make 6 hundreds, etc. as they build numbers with tens and exchange them for hundreds. Students learn that multiples of 100 are written as a three-digit number by writing the number of hundreds and using zeros to represent tens and ones.

Access for Students with Disabilities	**Access for English Learners**
Activity 1: Engagement	Activity 3: MLR8 Discussion Supports

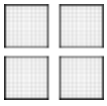
Student-facing Learning Goal: Let's compose hundreds using tens.

Warm-up Narrative: True or False: Less than or Equal to 100	**Building on CCSS:** 2.NBT.A.1

The **purpose** of this True or False is to elicit strategies and understandings students have for the new unit called a hundred. These understandings help students deepen their understanding that a three-digit number is greater than any two-digit number. This will be helpful later when students will need to be able to represent numbers in multiple ways.

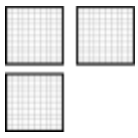
Task Statement	**Launch/Activity**
Is each statement true or false? Be prepared to explain your reasoning. • 100 > 99	• Display one problem. • "Give me a signal when you know whether the equation is true or false and can explain how you know."

• 100 < 99 + 1 • 98 + 3 > 100 • 50 + 50 + 50 > 100 **Student Responses** • True. Sample response: When you count, 100 comes after 99, 100 has 3 digits, 100 is 10 tens and 99 is 9 tens and 9 ones. • False. Sample response: 100 comes after 99, so one more than 99 is 100. • True. Sample response: 98 is 2 away from 100, so if you add 3 it has to be more than 100. • True. Sample response: I know 50 + 50 = 100, so it has to be more with another 50.	• 1 minute: quiet think time • Share and record answers and strategy. • Repeat with each problem. **Synthesis** • "How can you justify your answer without doing any calculations?"
Activity 1 Narrative: Making Hundreds Using Tens	**Addressing CCSS:** 2.NBT.A.1.A. 2.NBT.A.1.B, 2.NBT.A.2
The purpose of this activity is for students to use groups of 10 tens to compose multiples of 100. Students use base-ten blocks to make groups of 10 tens, and then exchange them for hundreds. Students find the total number of tens and the total number of groups, and then represent the same quantity using hundreds. They represent multiples of 100 as three-digit numbers by writing the number of hundreds and using zeros to represent tens and ones.	
SwD Support Tags • Engagement	
SwD Support Text *Engagement: Develop Effort and Persistence.* Activity: Check in and provide each group with feedback that encourages collaboration and community. *Supports accessibility for: Social-Emotional Functioning*	
Task Statement	**Launch/Activity** • Groups of 4

1. Use your base-ten blocks to show this number. 
   a. How many tens? _____
   b. How many hundreds? _____
   c. Write it as a three-digit number.
   _____

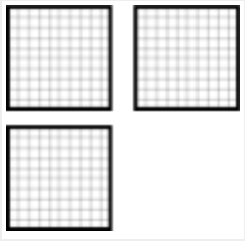
2. Use your base-ten blocks to show this number.
   
   a. How many tens? _____
   b. How many hundreds? _____
   c. Write it as a three-digit number.
   _____

3. Use your base-ten blocks to show this number.
   
   a. How many tens? _____
   b. How many hundreds? _____
   c. Write it as a three-digit number.
   _____

4. Use your base-ten blocks to show this number.
   
   a. How many tens? _____
   b. How many hundreds? _____
   c. Write it as a three-digit number.
   _____

Student Responses

- Give each group at least 50 of the tens base-ten blocks.
- "Yesterday, we talked about the unit of a hundred. Just as we can count by ones or tens, we can count by hundreds."
- Display image or show 3 hundred blocks.



- "How many hundreds?" (3)
- 30 seconds: quiet think time
- Share responses
- "Turn to a partner and whisper how many ones you believe this image represents."
- Write 300
- "I would write this as 300 because the total value is 300. There are 3 hundreds, zero extra tens, and zero extra ones."
- "Work with your group to build the numbers shown with your base ten blocks. Each time, record the total number of tens and the total number of hundreds and the total value with a drawing and as a three digit number."
- 10 minutes: small group work time

Synthesis

- "What did you notice about the number of tens and the number of hundreds?" (30 tens/3 hundreds, 40 tens/4 hundreds, 50 tens/5 hundreds)
- 30 seconds: quiet think time
- 1 minute: partner discussion

1.
   a. 40
   b. 4
   c. 400
2.
   a. 20
   b. 2
   c. 200
3.
   a. 50
   b. 5
   c. 500
4.
   a. 30
   b. 3
   c. 300

- "How many hundreds would I have if I have 80 tens? (8 hundreds)"
- 30 seconds: quiet think time
- Share responses.

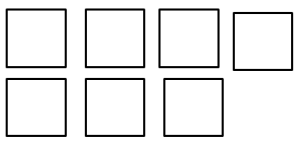
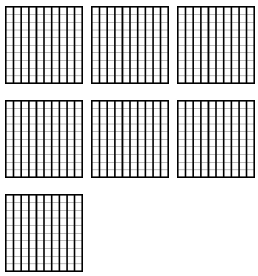
Activity 2 Narrative: How Many Hundreds?

Addressing CCSS: 2.NBT.A.1.A. 2.NBT.A.1.B, 2.NBT.A.2

The **purpose** of this activity is for students to consider representations of multiples of 100. They compare compositions of 700 and critique the reasoning of others. Students recognize that base-ten drawings represent a specific amount even when all of the ones are not outlined. Students make connections between multiples of 10 and multiples of 100, as they consider the relationship between 70 tens and 7 hundreds.

Task Statement

Han and Jada represented the same number using numbers, drawings and words.

Jada	Han
	

Launch/Activity

- "Han and Jada represented the same number using drawings and words. Their drawings and words are different, but they both have the same total value. Explain how each student's representation is different and how they represent 700."
- 5 minutes: independent work time

Synthesis

I have 7 hundreds.	I have 70 tens.
Total Value: 700	Total value: 700

Explain how each student's representation is different and how they represent 700.

Student Responses
Answers vary. Sample response:
Jada grouped the tens to make hundreds. She counted by hundreds, so she has 7 hundreds. The total value is 700. Han counted the number of tens instead of counting the hundreds. The total value is still 700 because there are 700 ones.

- "Jada and Han both got a total value of 700. Who did it the right way?"
- Share responses
- "700 can be represented as 7 hundreds or 70 tens. How many ones would it be?"
- Share and record responses.
- "In each of these examples, the total value is still 700. We write it as a three-digit number by showing the total number of hundreds we can make."
- Write 700

Activity 3 Narrative: What Do You Know About 800?

Addressing CCSS: 2.NBT.A.1.A. 2.NBT.A.1.B, 2.NBT.A.2

The **purpose** of this What Do You Know About is to invite students to share what they know and how they can represent the number 800. Students have multiple ways to represent 800 based on the work of this lesson.

MLR Tags
- MLR8 Discussion Supports

EL Support Text
MLR8 Discussion Supports.Synthesis: For each observation that is shared, invite students to turn to a partner and restate what they heard using precise mathematical language.
Advances: Listening, Speaking,Representing

Task Statement
What do you know about 800?

Student Responses
Answers vary. Sample responses:
- It's 80 tens.
- It's 800 ones.
- It's less than 900.

Launch/Activity
- Display the number.
- "What do you know about 800? How can you represent it?"
- 1 minute: quiet think time
- Record responses.

Synthesis

• You can represent it with 8 large squares.	• "What do you know about 800 that you didn't know before this lesson?" • "In what different ways could we represent 800?" (800 ones, 80 ten blocks, 8 hundred blocks, 8 squares like Jada) • 30 seconds: quiet think time • 1 minute: partner discussion. • Share responses.

Lesson Synthesis

"Today we learned that we can count by hundreds, tens, or ones to find total values. If Mai has 200 ones, what other ways could we describe this number?" (2 hundreds, 20 tens)
1 minute: partner discussion
Share responses

If students need more practice before the cool-down, ask them how many tens and ones are in numbers such as 600 and 900.

2.4 Lesson 9: Representing Three-Digit Numbers

Teacher-facing Learning Goals

- Understand that the digits in three-digit numbers represent hundreds, tens and ones.
- Identify the value of the digits in a three-digit number.
- Write three-digit numbers in expanded and standard form.

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

Lesson Purpose

The purpose of this lesson is for students to use base-ten representations to build an understanding of the digits in three-digit numbers as well as standard notation.

Materials Needed

Gather	**Copy**
• bag of 35 ten blocks for each group of 4 students • base-ten blocks • display image (warm-up)	• none

Cool-down Representing Three-Digit Numbers

1. Represent the number 375 as the sum of hundreds, tens and ones.

   _____

2. Represent the sum as a three-digit number.

   200 + 40 + 7 _____

Student Responses

1. 300 + 70 + 5 or the same addends in a different sequence
2. 247

Teacher Reflection Question

In Grade 1, students developed an understanding of the digits in a two-digit number. How did the work of this lesson reinforce that understanding? How did it build on that understanding?

Lesson Narrative

In grade 1, students learned that 10 ones make a ten. In previous lessons, students learned that 10 tens make a hundred. The purpose of this lesson is for students to bridge these understandings to represent three-digit numbers that are not multiples of 100. Students see three-digit numbers represented with base-ten blocks. They represent the numbers as the sum of hundreds, tens and ones and a three-digit number.

Access for Students with Disabilities	**Access for English Learners**
Activity 2: Engagement	Activity 1: MLR8 Discussion Supports

Student-facing Learning Goal: Let's represent three-digit numbers in different ways.

Warm-up Narrative: How Many Do You See? Building Three-Digit Numbers

Addressing CCSS: 2.NBT.A.1

The purpose of this How Many Do You See is to build on what students know about place value to make sense of a visual representation of a three-digit number.

In this activity, students have an opportunity to look for and make use of structure (MP7) because it focuses on the structure of the place value system.

Task Statement

How many do you see and how do you see them?

Image 1:

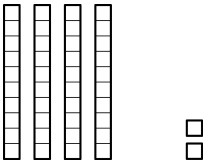


Image 2:

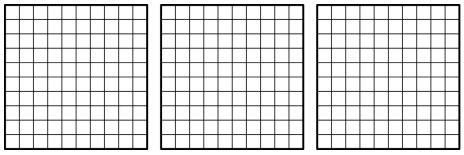
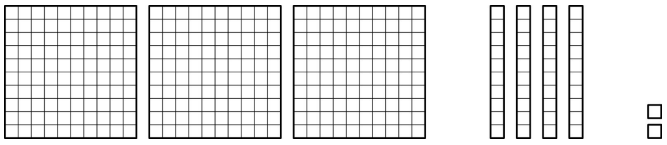


Image 3:



Launch/Activity

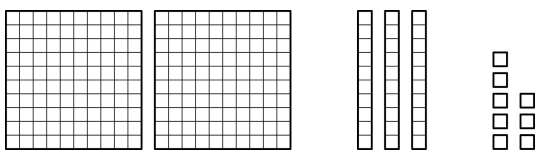
- Groups of 2
- "How many do you see and how do you see them?"
- Display image.
- 1 minute: quiet think time
- Display image.
- 1 minute: partner discussion
- Record responses.

Synthesis

- "How are images 2 and 3 different?" (Image 2 only has 300, image 3 has 300 and also 42. Image 2 has no tens or ones, image 3 has hundreds, tens and ones.)

Student Responses Sample Response: • 42, I counted 10, 20, 30, 40, 41, 42 • 300, I know 3 hundreds is 300 • 342, I see the 300 and the 42. That's 342.	
Activity 1 Narrative: Representing 35 Tens	**Addressing CCSS:** 2.NBT.A.1, 2.NBT.A.3
The purpose of this activity is for students to build on what they have learned about making hundreds from 10 tens, to represent 35 tens. If students use drawings to represent the value of the blocks, ask them to use numbers or numbers and words to represent the value.	
MLR Tags • MLR8 Discussion Supports	
EL Support Text *MLR8 Discussion Supports.*Activity: Think aloud and use gestures to emphasize the different representations of 35 tens..For example, point to the representation and its relationship to the value. *Advances: Listening, Representing*	

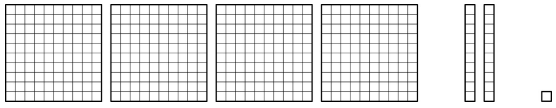
	Launch/Activity
	• Groups of 4
	• Give each group 35 tens.
	• "You are going to figure out the value of your blocks represent the number on your paper."
	• 7 minutes: group work time
	• Monitor for students who represent the number as:
	  ○ 3 hundreds 5 tens
	  ○ 300 and 50
	  ○ 350
	  ○ 300 + 50
	
	Synthesis
	• Share students' representations in the order listed above.
	• "What connections do you see between each student's representation?"
	• 30 seconds: quiet think time

	• 1 minute: partner discussion • Share responses. • "____ made 3 hundreds from 30 tens and had 5 tens left. _____ wrote the value of the hundreds, 300, and the value of the 5 tens, 50. We can also write that as 300 + 50. ____ represented the blocks with a number, 350. Each of these different ways represent the same number." • If no student wrote an equation, display 300 + 50 = 350.
Activity 2 Narrative: Writing Expressions and Three-Digit Numbers	**Addressing CCSS:** 2.NBT.A.1, 2.NBT.A.3
The purpose of this activity is for students to write three-digit numbers as the sum of hundreds, tens and ones as well as a written number.	
SwD Support Tags • Engagement	
SwD Support Text *Engagement: Provide Access by Recruiting Interest.* Activity:Leverage choice around perceived challenge. Invite students to select at least 3 of the remaining 5 problems. *Supports accessibility for: Organization; Attention; Social-emotional skills*	
Task Statement 1. You had 350. Then I gave you 6 ones. How many do you have now? Represent the number. Write each number as the sum of hundreds, tens, and ones, and a three-digit number. 2. 	**Launch/Activity** • Groups of 2 • Give each group 35 tens from activity 1 and 6 ones. • "You had 350. Then I gave you 6 ones. How many do you have now? See if you can record the total in more than one way." • 1 minute: independent work time • 2 minutes: partner work time • Share responses. • "We can represent the amount we have

Sum of hundreds, tens, and ones

_____

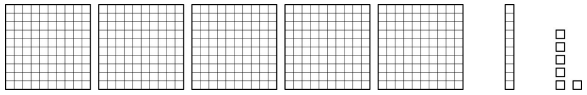
Three-digit number _____

3. 

Sum of hundreds, tens, and ones

_____

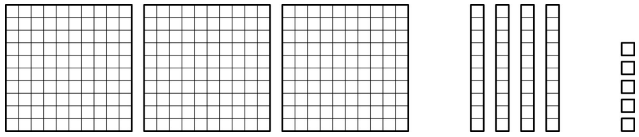
Three-digit number _____

4. 

Sum of hundreds, tens, and ones

_____

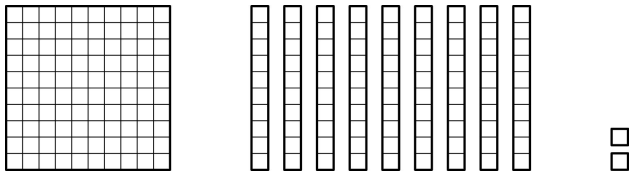
Three-digit number _____

5. 

Sum of hundreds, tens, and ones

_____

Three-digit number _____

6. 

Sum of hundreds, tens, and ones

_____

Three-digit number _____

now by writing a sum of hundreds, tens and ones 300 + 50 + 6, or as a 3-digit number - 356."

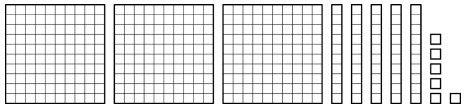
- Write 300 + 50 + 6 = 356.
- "Now you will practice writing numbers in both of these ways."
- 7 minutes: partner work time

Synthesis

- Share and record responses for each problem.
- Display problem 1.
- "Clare represented this number as 200 + 30 + 8. Han represented this number as 30 + 8 + 200. Did they both represent this number accurately?" (Yes, when writing an expression to represent a number, it doesn't need to be in place value order.)
- "We can write an expression with the values of the hundreds, tens and ones in any order. The value of the number stays the same."

Student Responses

1. Answers vary. Sample responses: 300 + 50 + 6, 356,



2. 200 + 30 + 8, 238
3. 400 + 20 + 1, 421
4. 500 + 1- + 6, 516
5. 300 + 40 + 5, 345
6. 100 + 90 + 2, 192

Lesson Synthesis

"Today we represented numbers as expressions and written numbers."

Display 426 and 400 + 20 + 6.
"Explain how you know these represent the same value."
30 seconds: quiet think time
1 minute: partner discussion

"How could we represent 547 as the sum of hundreds, tens, and ones?"
1 minute: partner discussion
Share and record 500 + 40 + 7.

2.4 Lesson 10: Identifying and Writing Three-Digit Numbers

Teacher-facing Learning Goals

- Understand that the digits in three-digit numbers represent hundreds, tens and ones.
- Write three-digit numbers in expanded and standard form.
- Consider the position of the digits when writing three-digit numbers.

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

Lesson Purpose

The purpose of this lesson is for students to use their understanding of place value and standard notation, to identify and write three-digit numbers.

Materials Needed

Gather • base-ten blocks • display image (warm-up)	**Copy** • none

Cool-down Order of Digits
Write the numbers that make the equation true.

1. 638 = _____ ones + _____ hundreds + _____ tens

2. 7 tens + 2 ones + 4 hundreds = _____

Student Responses

1. 8 ones + 6 hundreds + 3 tens
2. 472

Teacher Reflection Question

Who participated in math class today? What assumptions are you making about those who did not participate? How can you leverage each of your student's ideas to support them in being seen and heard in tomorrow's math class?

Lesson Narrative

In previous lessons, students learned that the three digits in a three-digit number represent amounts of hundreds, tens, and ones. They also learned the standard notation for writing three-digit numbers.

The purpose of this lesson is for students to build on their understanding to recognize three-digit numbers when the hundreds, tens and ones are represented in a different order.

Access for Students with Disabilities Activity 1: Engagement	**Access for English Learners** Activity 2: MLR8 Discussion Supports

Student-facing Learning Goal: Let's identify and write three-digit numbers.

Warm-up Narrative: How Many Do You See: Base Ten Blocks	**Addressing CCSS:** 2.NBT.A.1

The **purpose** of this How Many Do You See is to allow students to use the structure of base-ten blocks to figure out the value of images. Students may name the blocks they see (3 hundreds, 2 tens and 4 ones) or use an addition expression (300 + 20 + 4) or name the number (324).

Task Statement

How many do you see and how do you see them?

Image 1

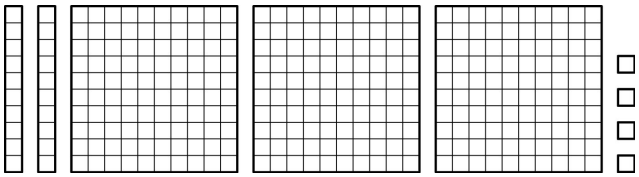


Image 2

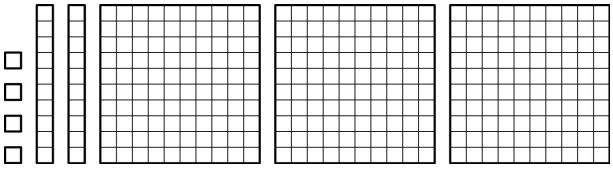
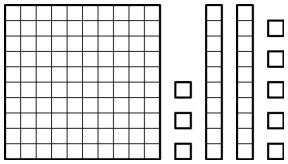


Image 3



Student Responses

1. 324. Sample response: I saw the 3 hundreds then the 2 tens and the 4 ones and that makes 324.
2. 324. Sample response: it's the same blocks in a different order.
3. 128. Sample response: There's 1 hundred, 2 tens and 8 ones.

Launch/Activity

- Groups of 2
- "How many do you see and how you do see them?"
- Flash image.
- 30 seconds: quiet think time
- Display image.
- 1 minute: partner discussion
- Record responses as an expression using hundreds, tens and ones.
- Repeat for each image.

Synthesis

- "Did anyone see the blocks the same way but would explain it differently?"
- "Does anyone want to add an observation to the way ____ saw the blocks?"
- If time, ask students to represent image 1 as a sum of hundreds, tens, and ones.

Activity 1 Narrative: Base-Ten Equations

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

The purpose of this activity is for students to recognize three-digit numbers when the digits and value of digits are presented out of place value order.

SwD Support Tags

- Engagement

SwD Support Text

*Engagement: Develop Effort and Persistence.*Activity: Chunk this task into more manageable parts. Check in with students to provide feedback and encouragement after each chunk.
Supports accessibility for: Organization, Attention, Social-Emotional Functioning

Task Statement

Write the number that makes the equation true. Use base-ten blocks or diagrams if they help.

1. 4 hundreds + 6 tens + 2 ones = _____
2. 7 ones + 2 hundred + 6 tens = _____
3. 3 tens + 5 hundreds = _____
4. 7 ones + 3 hundreds = _____
5. 315 = _____ hundreds + _____ ones + _____ ten
6. 462 = 2 + 400 + _____

Student Responses

1. 462
2. 267
3. 530
4. 307
5. 3 hundreds + 5 ones + 1 ten
6. 60

Launch/Activity

- Groups of 2
- Give students access to base ten blocks.
- "You are going to work with equations that have a missing number. Find the number that makes the equation true."
- 6 minutes: partner work time

Synthesis

- Share and record responses for each problem.
- "Clare and Elena disagree on number 4. Clare wrote 7 ones + 3 hundreds = 37 and Elena wrote 7 ones + 3 hundreds = 307. Who do you agree with? Explain."
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share responses.
- "In order to show that you have 3 hundreds, you must have 3 digits in your number. The 3 in 37 represents 3 tens because of where it is in the number. If you have 3 hundreds and 7 ones, you need to put a zero in your number to represent zero tens. 307 represents 3 hundreds and 7 ones."

Activity 2 Narrative: Base-Ten Riddles

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

The purpose of this activity is for students to use their understanding of place value to determine the number described in a riddle. Students then write the number as the sum of hundreds, tens, and ones as well as a three-digit number.

MLR Tags

- MLR8 Discussion Supports

EL Support Text *MLR8*

Discussion Supports. Activity: Invite students to begin partner interactions by repeating the riddle. This gives both students an opportunity to produce language.

Advances: Conversing

Task Statement

Solve each riddle. Write the number as a three-digit number and the sum of hundreds, tens, and ones.

1. I have 6 hundreds, 2 ones and 7 tens. What number am I?
2. I have 3 ones and 5 tens. The number of hundreds I have is the sum of my ones and tens. What number am I?
3. I have fewer ones than hundreds. I have 4 tens and 1 hundred. What number am I?
4. I have 1 hundred and 2 tens. The sum of my digits is 5. What number am I?
5. The value of my hundreds is 700. I have 4 ones. I have no tens. What number am I?
6. I have more tens than ones. I have 6 hundreds and 4 ones. What number could I be?

Are you ready for more? Write a number riddle and have your partner solve it.

Student Responses

1. 672
2. 853
3. 140
4. 122
5. 704
6. Sample responses: 654, 664, 674, 684, 694

Launch/Activity

- Groups of 2
- Give students access to base-ten blocks.
- "You are going to solve number riddles. You can use base-ten blocks if they will help you."
- 6 minutes: independent work time
- 5 minutes: partner discussion
- If students finish early, ask them to write their own riddles and trade them with other groups to solve.

Synthesis

- "Which riddle did you think was the easiest to solve? Which riddle did you think was the hardest to solve? What made it the hardest?"
- "Did using the base-ten blocks help solve the riddles? How did they help?"

Lesson Synthesis

Today we learned that three-digit numbers can be represented with their hundreds, tens and ones out of order. We learned that it is very important to put those digits in the correct place when representing the quantity with a three-digit number.

"Han says 5 tens + 4 ones + 7 hundreds = 547. What would you say to Han about his thinking?"
30 seconds: quiet think time
1 minute: partner discussion
Share responses.

2.4 Lesson 12: Composing and Decomposing Three-Digit Numbers

Teacher-facing Learning Goals

- Compose and decompose three-digit numbers in many ways.
- Notice patterns based on place value when decomposing numbers in different ways.

Addressing CCSS: 2.NBT.A.1, 2.NBT.A.2

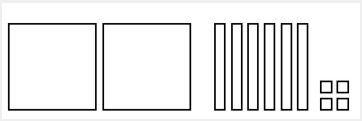
Lesson Purpose
The purpose of this lesson is for students to compose three-digit numbers in different ways.

Materials Needed

Gather	**Copy**
• base ten blocks • display Image (lesson synthesis)	• none

Cool-down: Break Apart 264
Use drawings, numbers, or words to break apart 264 in 2 different ways.

Student Responses
Answers vary. Sample responses:

- 
- 1 hundred, 16 tens 4 ones
- 26 tens 4 ones

Teacher Reflection Question
How were students thinking about different ways to compose numbers? Did they come up with different ways randomly, or did they have a strategy involving decomposing a hundred into 10 tens or a ten into 10 ones?

Lesson Narrative

In previous lessons, students learned that the three digits of a three-digit number represent amounts of hundreds, tens and ones.
The purpose of this lesson is for students to compose numbers in different ways by working flexibly with hundreds, tens and ones. Students experience using 10 tens instead of 1 hundred or 10 ones instead of 1 ten and are able to see that numbers composed in these different ways still have the same value.

Access for Students with Disabilities	**Access for English Learners**
Activity 2: Engagement	Activity 1: MLR8 Discussion Supports

Student-facing Learning Goal: Let's make and break apart numbers in different ways.

Warm-up Narrative: True or False: Value of Digits

Addressing CCSS: 2.NBT.A.1

The purpose of this True or False is to elicit strategies and understandings students have for working with the value of the digits in a three-digit number. These understandings help students deepen their understanding that numbers can be represented in different ways. This will be helpful later when students will need to be able to represent numbers in multiple ways.

In this activity, students have an opportunity to look for and make use of structure (MP7) as they consider the value of each digit and how a three-digit number can be written as the sum of hundreds, tens and ones.

Task Statement

Is each statement true or false? Be prepared to explain your reasoning.

- 800 + 90 + 7 = 897
- 156 = 50 + 100 + 6
- 407 = 70 + 400
- 632 = 22 + 10 + 600

Student Responses

- True. Sample response: 800 is the value of the 8 in 897, 90 is the value of the 9 and 7 is the value of the ones.
- True. Sample response: They are out of order, but it is still 156.

Launch/Activity

- Display one problem.
- "Give me a signal when you know whether the equation is true and can explain how you know."
- 1 minute: quiet think time
- Share and record answers and strategies.
- Repeat with each problem.

Synthesis

- "What is different about the last equation?" (It's not just broken down into hundreds, tens and ones.)

• False. Sample response: 407 is 400 and 7, not 70. • True. Sample response: 22 + 10 = 32 and 32 + 600 = 632	
Activity 1 Narrative: Breaking Apart 214	**Addressing CCSS:** 2.NBT.A.1, 2.NBT.A.2
The purpose of this activity is for students to work flexibly with hundreds, tens and ones. When representing a number in different ways, students see that they can use different amounts of each unit. For example, you can make 200 with 2 hundreds, or 1 hundred and 10 tens.	
MLR Tags • MLR8 Discussion Supports	
EL Support Text *MLR8 Discussion Supports*. Synthesis: At the appropriate time, give groups 2–3 minutes to plan what they will say when they present to the class. "Practice what you will say when you share your representations with the class. Talk about what is important to say, and decide: who will speak and who will share each part." *Advances: Speaking, Conversing, Representing*	

Task Statement
Break apart 214 in more than 1 way using hundreds, tens, and ones. Show your thinking using drawings, numbers or words.
 	
Student Responses
Sample response:
• 2 hundreds, 1 ten, 4 ones
• 2 hundreds, 14 ones
• 1 hundred 11 tens, 4 ones
	Launch/Activity
	• Groups of 2
	• Give students access to base-ten blocks.
	• "Break apart 214 in more than 1 way."
	• 1 minute: quiet think time
	• 5 minutes: partner work time
	• Monitor for students who represent with base-ten blocks, drawings, and numbers that:
	  ○ Show 2 hundreds, 1 ten, and 4 ones
	  ○ Show 1 hundred, 11 tens, and 4 ones
	
	Synthesis
	• Ask selected students to share.
	• Display 2 ways to break apart 214 with base-ten blocks.

	○ 2 hundreds, 1 ten, 4 ones ○ 1 hundred, 11 tens, 4 ones ● "How are these representations of 214 different?" (One has 2 hundreds and the other only has 1 hundred. One has 1 ten and the other has 11 tens.) ● 30 seconds: quiet think time ● Share responses. ● "How could these represent the same number when they do not have the same number of hundreds and ten?" (Instead of using 2 hundreds, you can use 1 hundred and 10 tens for the other hundred. That still makes 200. Then you need 1 more ten and 4 ones.) ● 30 seconds: quiet think time ● Share responses. ● If there is extra time, repeat the activity with the number 325.
Activity 2 Narrative: Different Ways to Make 523	**Addressing CCSS:** 2.NBT.A.1, 2.NBT.A.2
The purpose of this activity is to deepen the understanding that 10 tens is the same as 1 hundred. Students use this understanding to make numbers in different ways. Students represent the same number with different amounts of hundreds, tens, and ones. In the synthesis, students discuss how they needed 10 more tens to create the same number when they started with 1 less hundred. To add movement to this activity, groups of 4 can create a poster with quadrants to show the different ways they broke apart 523 and then have students do a gallery walk to look for similarities and differences.	
SwD Support Tags ● Engagement	
SwD Support Text *Engagement: Develop Effort and Persistence.* Activity: Differentiate the degree of difficulty or complexity. Begin with a number they have worked with in another activity or one with a more accessible value. *Supports accessibility for: Conceptual Understanding, Social-Emotional Functioning*	
Task Statement	**Launch/Activity** ● Groups of 2

Find different ways to make 523. Show your thinking using drawings, numbers, or words.

523	523
523	523

Student Responses

Sample responses:

- 5 hundreds 2 tens 3 ones
- 4 hundreds 12 tens 3 ones
- 3 hundreds 22 tens 3 ones
- 2 hundreds 32 tens 3 ones

- Give students access to hundreds, tens, and ones.
- "Find different ways you can make 523 with your base-ten blocks. Record each way."
- 10 minutes: partner work time
- Monitor for students who demonstrate an understanding of 10 tens as 1 hundred and use this to strategically change how they make 520.

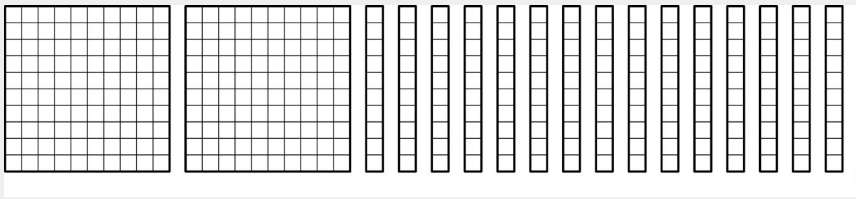
Synthesis

- Select students to share the different ways they made 523.
- Record compositions in order (as shown in student responses).
- "What patterns do you notice?"(the hundreds are going down by 1, the tens are going up by 10)
- 30 seconds: quiet think time
- Share responses.
- "Why does this happen?"(There are 10 tens in every hundred so if we use 1 less hundred we have to make up for it with 10 more tens.)
- 30 seconds: quiet think time
- Share responses.
- "What is another way to make 523?"
- 30 seconds: quiet think time
- Share responses.

Lesson Synthesis

"Today we represented numbers with different amounts of hundreds, tens, and ones."

Display image :



"Han says this represents 350 but Tylers says that can't be right because there are only 2 hundreds. What do you think?"
30 seconds: quiet think time
1 minute: partner discussion
Share responses.

2.4 Lesson 13: Representing Numbers in Different Ways with Hundreds, Tens and Ones

Teacher-facing Learning Goals

- Identify numbers represented with different amounts of hundreds, tens, and ones.
- Represent numbers with different amounts of hundreds, tens, and ones.

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

Lesson Purpose

The purpose of this lesson is for students to identify and represent numbers with different amounts of hundreds, tens and ones.

Materials Needed

Gather	**Copy**
• base-ten blocks • display Image (warm-up, Activity 1, lesson synthesis)	• none

Cool-down: Completing Equations

1. 7 ones + 3 hundreds + 14 tens = _____
2. 278 = 2 hundreds + _____ tens + 18 ones

Student Responses

1. 447
2. 6 tens

Teacher Reflection Question
What part of the lesson went really well today in terms of students' learning? What did you do that made that part go well?

Lesson Narrative

In a previous lesson, students composed and broke apart three-digit numbers with different amounts of hundreds, tens and ones.

The purpose of this lesson is for students to continue working flexibly with these units. In this lesson, students will identify numbers and parts of numbers that are missing when represented in different ways.

Access for Students with Disabilities	**Access for English Learners**
Activity 1: Engagement	Activity 2: MLR8 Discussion Supports

Student-facing Learning Goal: Let's represent more numbers with hundreds, tens and ones.

Warm-up Narrative: Estimation Exploration: How Many Ones?

Addressing CCSS: 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. It gives students a low-stakes opportunity to share a mathematical claim and the thinking behind it (MP3). In this warm-up students estimate the number of ones in a base-ten representation.

Task Statement

What is the value of the blocks?

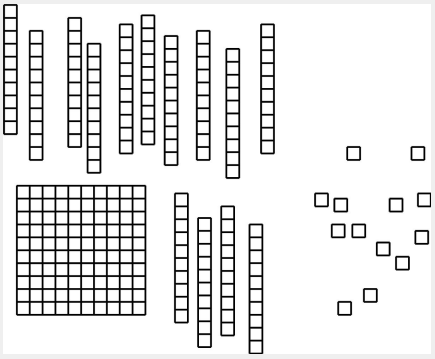
Record an estimate that is:

too low	about right	too high

Student Responses
Sample responses

Launch/Activity

- Groups of 2
- Flash image.



- "What is an estimate that's too high?" "Too low?" "About right?"

<table>
<tr><td>

- Too low: 100-190
- About right: 200-270
- Too high: above 300

</td><td>

- 1 minute: quiet think time
- 1 minute: partner discussion
- Record responses.

Synthesis

- "Is anyone's estimate less than 100? Is anyone's estimate greater than 300?"
- "Based on this discussion does anyone want to revise their estimate?"

Optional: Display image to reveal the actual value and add it to the display.

</td></tr>
<tr><td>Activity 1 Narrative: What's the Number?</td><td>Addressing CCSS: 2.NBT.A1, 2.NBT.A.3</td></tr>
<tr><td colspan="2">The purpose of this activity is for students to identify numbers represented with different amounts of hundreds, tens and ones. Students write these numbers using standard notation.</td></tr>
<tr><td colspan="2">SwD Support Tags

- Engagement

</td></tr>
<tr><td colspan="2">SwD Support Text
Engagement: Provide Access by Recruiting Interest. Activity: Leverage choice around perceived challenge. Invite students to select at least 4 of the 6 problems to complete.
Supports accessibility for: Organization; Attention; Social-emotional Functioning</td></tr>
<tr><td>

Task Statement

Write the three-digit number. Use base-ten blocks or drawings if they help.

1. 2 hundreds, 15 tens, 1 one = _____
2. 4 tens, 2 hundreds, 11 ones = _____
3. 3 ones, 17 tens = _____
4. 4 hundreds, 10 tens = _____
5. 3 hundreds, 12 tens, 14 ones = _____
6. 1 hundred, 36 tens, 2 ones =

</td><td>

Launch/Activity

- Groups of 2
- Give students access to base ten blocks.
- "Look at numbers represented with different amounts of hundreds, tens and ones. Identify the number and write it as a three-digit number."
- 5 minutes: partner work time

Synthesis

- Share and record responses for each problem.
- "How did you know when you had to compose a new ten or a new hundred?"

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</table>

_____ **Student Responses** 1. 351 2. 251 3. 173 4. 500 5. 434 6. 462	(when there are ten or more ones or tens) ● "How is problem 5 different than the rest of the items?" (you have to compose a new hundred and a new ten) ● Display image  ● "What do you have to do to write this as a three-digit number?" (You have to turn the 10 ones into 1 ten and then 10 tens into 1 hundred.) ● 30 seconds: quiet think time ● 1 minute: partner discussion ● Monitor for a student who ○ counts by hundreds, tens and ones ○ Looks for ten of a unit and makes as many bigger units as you can first then puts them together. ● Ask selected students to share their thinking.
Activity 2 Narrative: Finding Missing Parts	**Addressing CCSS:** Round 1
The purpose of this activity is for students to identify the missing parts of equations by working flexibly with hundreds, tens and ones. This gives students another chance to see that there are so many different ways that numbers can be composed, including using only ones.	
MLR Tags ● MLR8 Discussion Supports	
EL Support Text *MLR8 Discussion Supports*. Synthesis: For each observation that is shared, invite students to turn to a partner and restate what they heard using precise mathematical language such as ones, tens, and hundreds. *Advances: Listening, Speaking*	

Task Statement

1. Find 2 different ways to compose 423.

   423 = 3 hundreds + _____ tens + _____ ones

   423 = 3 hundreds + _____ tens + _____ ones

2. 141 = ___ tens + 1 one

   141 = 13 tens + ___ ones

3. 203 = ___ tens + ___ ones

   203 = 19 tens + ___ ones

4. 228 = 2 hundred + 1 ten + ___ ones

   228 = 1 hundred + ___ tens + 8 ones

5. 105 = _____ ones

Student Responses

1. Answers vary. Sample responses:
   3 hundreds + 12 tens + 3 ones
   3 hundreds + 11 tens + 13 ones
   3 hundreds + 2 tens + 103 ones
2. 14
   11
3. 20 tens 3 ones
   19 tens 13 ones
4. 18
   12
5. 105

Launch/Activity

- Groups of 2
- Give students access to base-ten blocks.
- "Now you will look at representations of numbers that are missing some parts. Figure out what is missing in order to represent the number shown."
- 10 minutes: partner work time
- If students finish early, they can create their own problems to trade with their partner to complete.

Synthesis

- Display problem 1.
- "How did you compose 141 using no hundreds?" (14 tens 1 one)
- Share responses.
- Demonstrate with base-ten blocks.
- "Now what can we do to compose the same number with only 13 tens?" (Use 10 more ones, so 13 tens 11ones.)
- Share responses.
- "We used 1 fewer ten and 10 more ones to compose 141 the second time. We know that the value of the number stays the same if 10 is composed of 1 ten or 10 ones."

Lesson Synthesis

"There are lots of ways we can compose numbers using hundreds, tens and ones. We know we can use 1 hundred or 10 tens to make the same number. We can also use 1 ten or ten ones."

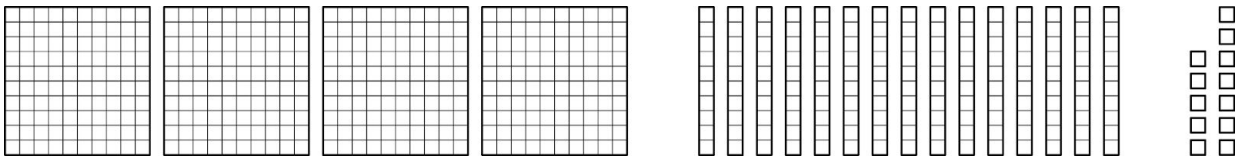
Display image

Number	Hundreds	Tens	Ones
149	1	4	9
149	1	3	19
149	1	2	29
149	1	0	49

“Explain the pattern you see and why it happens?” (When we take away 1 ten it adds 10 ones, when we take away 2 tens it adds 20 ones, and so on.)
1 minute: quiet think time
1 minute: partner discussion
Share responses.

Mini-Assessment 1

1. How many? _____



2. Select 2 ways to represent the number 518.
   a. 500 + 10 + 8
   b. 5 + 1 + 8
   c. 5 hundreds and 18 tens
   d. 51 tens and 8 ones
   e. 4 hundreds and 11 tens

3. Write three hundred eighty-six as a number. _____

   Han says that there are eighty tens in three hundred eighty-six. Do you agree with Han? Explain your thinking.

2.6 Lesson 14: Decomposing to Subtract

Teacher-facing Learning Goals

- Subtract one- and two-digit numbers from three-digit numbers, requiring decomposing a unit.
- Relate decomposing a ten to decomposing a hundred to subtract.

Addressing CCSS: 2.NBT.B.7

Lesson Purpose

The purpose of this lesson is for students to subtract from three-digit numbers. Students decompose a ten or a hundred in order to find the difference.

Materials Needed

Gather	**Copy**
• base-ten blocks	• none

Cool-down: Subtracting with One Decomposition

627 - 43

Write an equation to show the difference._____

Student Responses

627 - 43 = 584

Teacher Reflection Question

In previous units, students subtracted 2-digit numbers requiring the decomposition of a ten. How did this understanding support students as they subtracted from 3-digit numbers with decompositions in this lesson?

Lesson Narrative

In previous units, students have decomposed a ten in order to subtract within 100. In previous sections, students subtracted within 1,000 that did not require any decompositions and added within 1,000, composing a new unit, when needed.

The **purpose** of this lesson is for students to extend their understanding of decomposing tens to decompose hundreds to subtract within 1,000. Students use base-ten blocks to subtract one- and two-digit numbers from a three-digit number. They notice that sometimes it is necessary to decompose a ten and sometimes it is necessary to decompose a hundred in order to find the difference. In this

lesson, students record their work with an equation, the next several lessons will focus on written representations of students methods.

Access for Students with Disabilities	**Access for English Learners**
Activity 2: Representation	Activity 2: MLR7 Compare and Connect

Student-facing Learning Goal: Let's subtract.

Warm-up Narrative: Notice and Wonder: Equations

Addressing CCSS: 2.NBT.B.5

The purpose of this warm-up is to elicit the idea that just like addition sometimes requires composing new units, subtraction sometimes requires decomposing units. This serves as a transition from the work of the last section on addition and students will consider counting up to subtract later in the unit While students may notice and wonder many things about the equations, recognizing the relationship between composing and decomposing units is the important discussion point.

Task Statement

What do you notice? What do you wonder?

38 + 5 = 43

43 - 5 = 38

Student Responses

Students may notice:

- The same numbers are used in the addition and subtraction equations.
- You have to compose a new ten in the addition equation and decompose a ten in the subtraction equation.

Students may wonder:

- Can I count back to subtract?
- Do I have to decompose a ten?

Launch/Activity

- Groups of 2
- Display the equations.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time
- 1 minute: partner discussion
- Share and record responses.

Synthesis

Focus question:

- "If you represented both of these equations with base-ten blocks, when would you have to compose or decompose a unit?"

Activity 1 Narrative: Decomposing to Subtract

Addressing CCSS: 2.NBT.B.7

The purpose of this activity is for students to subtract from a three-digit number that requires decomposing a ten or a hundred. Students use their understanding of place value to decompose a

hundred for the first time, in order to subtract within 1,000. Students find differences using any strategy that makes sense to them. Many students may count back to find the difference, but the emphasis in the synthesis is on decomposing units.

Task Statement

1. 335 - 7

Write an equation that shows the difference.

2. 335 - 42

Write an equation that shows the difference.

Student Responses

1. 335 - 7 = 328
2. 335 - 42 = 293

Launch/Activity

- Groups of 2
- Give students access to base-ten blocks.
- "Today we are going to subtract from 3-digit numbers. Find the differences using any strategy that makes sense to you."
- 3 minutes: independent work time
- 3 minutes: partner discussion
- Monitor for students using base-ten blocks and exchanging a ten for 10 ones or a hundred for 10 tens.

Synthesis

- Previously selected students share and represent their strategy with base ten blocks.
- "How did _____ solve the problem? Did you do something like that?"
- 30 seconds: quiet think time
- Share responses.
- "What do these problems have in common?" (They both require breaking up a unit.)
- 30 seconds: quiet think time
- Share responses.

Activity 2 Narrative: Decomposing with Base Ten Blocks

Addressing CCSS: 2.NBT.B.7

The purpose of this activity is for students to subtract from a three-digit number that requires decomposing. Students use base-ten blocks to find differences. Some students may be able to find the difference without blocks but since this is the first time students are decomposing a hundred while subtracting, the blocks allow students to see the work of decomposing a unit. Students do not need to record their work with the base-ten blocks but they do need to write an equation that shows the

difference. In later lessons, students may use any representation that makes sense to them.

SwD Support Tags
- Representation

MLR Tags
- MLR7 Compare and Connect

EL Support Text
MLR7 Compare and Connect. Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask, "Did anyone solve the problem the same way, but would explain it differently?", "Why did the different approaches lead to the same outcome?"
Advances: Representing, Conversing

SwD Support Text *Representation: Internalize Comprehension.* Synthesis: Invite students to identify which details were most useful, needed to solve the problem. Display the sentence frame, "The next time I work with a subtraction problem that requires decomposing, I will pay attention to . . . "
Supports accessibility for: Memory

Task Statement
Use base-ten blocks to find the difference.
Write an equation that shows the difference.

1. 224 - 42
2. 443 - 71
3. 224 - 8
4. 143 - 7
5. 355 - 62
6. 351 - 15

Student Responses
1. 224 - 42 = 182
2. 443 - 71 = 372
3. 224 - 8 = 216
4. 143 - 7 = 136
5. 355 - 62 = 293
6. 351 - 15 = 336

Launch/Activity
- Groups of 2
- Give students access to base-ten blocks.
- "Now we are all going to use base-ten blocks to subtract."
- 6 minutes: independent work time
- 6 minutes: partner work time

Synthesis
- Student shares how to use blocks to find the difference in number 5.
- "What did _____ do to find the difference?"
- 30 seconds: quiet think time
- Share responses.
- Student shares how to use blocks to find the difference in number 6.
- "What did _____ do to find the difference?"
- 30 seconds: quiet think time
- Share responses.

Lesson Synthesis
"Today we saw that sometimes we need to decompose a hundred or a ten to subtract. How is decomposing a hundred like decomposing a ten?" (You can decompose both into 10 smaller units.)
30 seconds: quiet think time
Share responses.

2.6 Lesson 16: Planning for Decompositions

Teacher-facing Learning Goals

- Determine when a unit needs to be decomposed before subtracting.
- Subtract within 1,000, requiring decomposing a unit.

Addressing CCSS: 2.NBT.B.7

Lesson Purpose
The purpose of this lesson is for students to look at expressions to determine if a unit will need to be decomposed before subtracting.

Materials Needed

Gather	**Copy**
• base-ten blocks	• none

Cool-down: Considering Decompositions

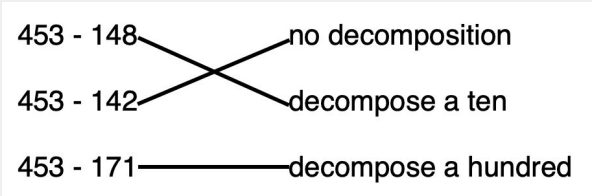
1. Draw a line from each expression to the phrase that describes the decompositions needed before subtracting.

453 - 148	no decomposition
453 - 142	decompose a ten
453 - 171	decompose a hundred

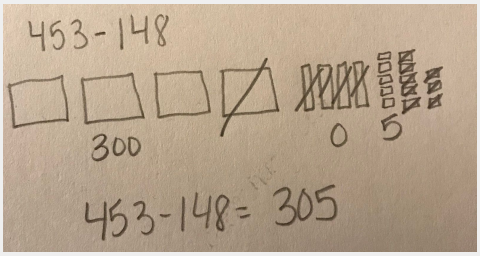
2. Choose one expression that needs a decomposition and find the difference. Show your thinking using drawings, symbols, or other representations.

Student Responses

1.



2. Answers vary. Sample response:



Teacher Reflection Question

Who participated in math class today? What assumptions are you making about those who did not participate? How can you leverage each of your student's ideas to support them in being seen and heard in tomorrow's math class?

Lesson Narrative

In a previous lesson, students subtracted one- and two-digit numbers from a three-digit number, requiring the decomposition of either a ten or a hundred. Students represented their thinking with base-ten blocks, drawing, words, or numbers.

The purpose of this lesson is for students to think about whether a unit will need to be decomposed before subtracting. Students then consider how representing numbers in different ways could be helpful when subtracting.

Access for Students with Disabilities	**Access for English Learners**
Activity 1: Action and Expression	Activity 1: MLR8 Discussion Supports

Student-facing Learning Goal: Let's think about decomposing before subtracting.

Warm-up Narrative: Choral Count: Hundreds and Tens	**Building Toward CCSS:** 2.NBT.B.71

The **purpose** of this Choral Count is to invite students to practice counting by 10 and notice patterns in the count. These understandings help students develop fluency and will be helpful later in this lesson when students will need to be able to decompose hundreds.

In this activity, students have an opportunity to look for and make use of structure (MP7) because the tens places repeats every hundred.

Task Statement

N/A

Student Responses

Record count:
350, 360, 370, 380, 390, 400, 410, 420, 430, 440, 450, 460, 470, 480, 490, 500, 510, 520, 530, 540, 550

Sample response:

- After you get to a 90, the next number is in the next hundreds
- Ten before 500 is 490
- 350 and 550 are 200 apart

Launch/Activity

- Count by 10, starting at 350.
- Record as students count.
- Stop counting and recording at 550.
- "What patterns do you see?"
- 1-2 minutes: quiet think time
- Record responses.

Synthesis

Focus question:

- "What comes after 390? What comes before 500?"

Activity 1 Narrative: Subtraction Sort

Addressing CCSS: 2.NBT.B.7

The **purpose** of this activity is for students to think about subtraction expressions before beginning to subtract. Students determine whether or not a decomposition is needed before subtracting. They distinguish between the need to decompose a ten or a hundred.

SwD Support Tags

- Action and Expression

MLR Tags

- MLR8 Discussion Supports

EL Support Text

MLR8 Discussion Supports. Synthesis: Before students share, remind students to use words such as decompose, equation, and expression.Invite students to chorally repeat the phrases that include these words in context.
Advances: Speaking, Representing

SwD Support Text

Action and Expression: Internalize Executive Functions. Activity: Invite students to plan a strategy, including the tools they will use, for sorting the expressions. If time allows, invite students to share their plan with a partner before they begin.
Supports accessibility for: Organization, Conceptual Processing

Task Statement

346 - 273	542 - 321	449 - 288
624 - 415	237 - 129	340 - 234
457 - 245	735 - 472	648 - 382
905 - 312	673 - 413	866 - 428
534 - 126	347 - 124	227 - 115

Sort the expressions into 3 categories:

decompose a ten	decompose a hundred	no decompositions

Choose 1 expression from each category and find the difference. Show your thinking using drawings, symbols, or other representations.

Student Responses

decompose a ten	decompose a hundred	no decompositions
624 - 415	346 - 273	542 - 321
237 - 129	449 - 288	457 - 245
340 - 234	735 - 472	673 - 413
866 - 428	648 - 382	347 - 124
534 - 126	905 - 312	227 - 115

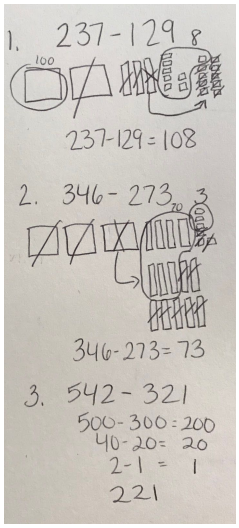
Launch/Activity

- Groups of 2
- "You are going to work with your partner to sort expressions into 3 groups. Look at the numbers in the expression and determine if a ten needs to be decomposed, a hundred needs to be decomposed, or if no decomposition is needed. Explain to your partner how you know. Write each expression in the appropriate column."
- 8 minutes: partner work time

Synthesis

- Display completed chart from student responses.
- Ask students to choose an expression and explain how they know it belongs in that column.
- "When you were finding the difference, did you use the same strategy for all 3 expressions? How did you choose your strategy?" (I used the blocks when I needed to decompose, but I didn't need to when I didn't have to decompose so I just wrote equations. Since I knew before starting when I was going to need to decompose, I knew I didn't need the blocks for one of them,)

Sample responses:



Activity 2 Narrative: Tyler's Representations

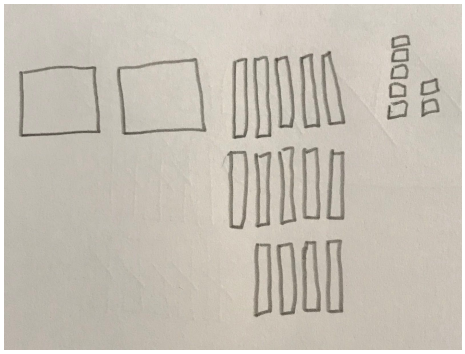
Addressing CCSS: 2.NBT.B.7

The purpose of this activity is for students to think about representing numbers in different ways and how that can be helpful when subtracting. Students recognize that it is helpful to represent the number with enough tens and ones to subtract, rather than needing to redraw or decompose units.

Task Statement

Tyler is finding the difference between 347 and 64.

He started by representing 347 with a drawing.



Why did Tyler represent 347 like this? How will it help

Launch/Activity

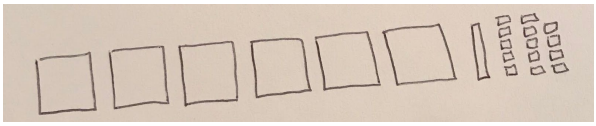
- Groups of 2
- "We are going to look at a drawing Tyler made in order to find the difference between 347 and 64. Why do you think Tyler represented 347 like this?"(So he would have enough tens to subtract 60. So he wouldn't have to redraw the hundred as ten ones when he subtracted.)
- 1 minute: quiet think time
- 2 minutes: partner discussion
- Share responses
- "Now choose an expression from the sort in activity 1 and show how Tyler

him subtract?

Choose one expression from the sort in activity 1 and show how Tyler might represent the number with a drawing.

Student Responses

- So he would have enough tens to subtract 60.
- So he wouldn't have to decompose a hundred while subtracting.
- Sample response: 624 - 415



would represent the number."
- 4 minutes: partner work time

- Monitor for students representing numbers from the sort in activity 1 with enough tens or ones to be able to subtract without decomposing.

Synthesis

- Previously identified students share how they represented numbers in the expressions from activity 1 sort, and explain why they chose to represent the numbers in this way.
- "Why did _____ represent the number this way?"
- 30 seconds: quiet think time
- Share responses.
- "If we know we need to decompose a ten or a hundred, we can think about representing the number differently from the beginning instead of having to redraw it. This can be helpful when subtracting."

Lesson Synthesis

"Today we looked at expressions and figured out what decompositions were needed before subtracting. Why is it helpful to think about the decompositions that are needed before beginning to find the difference?" (So you know what you need to decompose. So you can represent the number with the decomposition already done.)
30 seconds: quiet think time
Share responses.

Mini-Assessment 2

1. Find each difference. Show your thinking using diagrams, symbols, or other representations. Use base-ten blocks if it helps.

   528 - 315

   471 - 124

   600 - 594

2.3 Lesson 2: Numbers on the Number Line

Teacher-facing Learning Goals

- Identify defining features of number lines.

Addressing CCSS: 2.MD.B.6, 2.NBT.A.2

Lesson Purpose

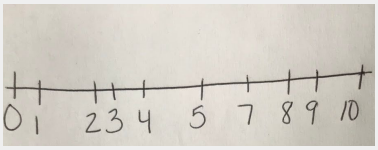
The mathematical purpose of this lesson is for students to identify defining features of number lines.

Materials Needed

Gather	**Copy**
• create cards for the numbers 0–10 and 20–30 (1 per number)	• none

Cool-down Analyzing Mai's Number Line

Mai made a number line.



Explain what Mai did wrong when creating her number line.

Student Responses

Mai didn't put the same amount of space between each number.
Mai skipped the number 6.

Teacher Reflection Question

Who actively participated during the Human Number Line activity? What assumptions are you making about those who did not participate? How can you leverage each of your student's ideas to support them in being seen and heard in tomorrow's class?

Lesson Narrative

In a previous lesson, students were introduced to number lines and represented the location of a number with a point on number lines up to 20.

The purpose of this lesson is for students to have opportunities to think about the defining features of number lines. In Activity 1, students each get a number and work together to decide how to place themselves to create a human number line, thinking about the importance of sequencing numbers from left to right. In Activity 2, students consider different number line diagrams and identify features that were not attended to when the diagrams were created. For example, one number line does not have equally spaced tick marks. Students recognize and discuss the problems they see with each diagram.

Access for Students with Disabilities	**Access for English Learners**
Activity 1: Engagement	Activity 2: MLR2 Collect and Display

Student-facing Learning Goal: Let's create and analyze number lines.

Warm-up Narrative: True or False: Making Tens to Add

Addressing CCSS: 2.NBT.5

The purpose of this True or False is to elicit strategies and understandings students have for making problems easier by making tens when possible. These understandings help students deepen their understanding of the properties of operations and will be helpful later when students will need to be able to fluently add within 100.

Task Statement

Is each statement true or false? Be prepared to explain your reasoning.

- 5 + 27 + 5 = 10 + 27
- 20 + 27 = 27 + 5 + 10
- 20 + 48 = 5 + 48 + 10 + 5

Student Responses

- True. Answers vary. Sample response: I put the 5s together to make 10 so both sides have 10 and 27.

Launch/Activity

- Display one problem.
- "Give me a signal when you know whether the equation is true and can explain how you know."
- 1 minute: quiet think time
- Share and record answers and strategy.
- Repeat with each problem.

Synthesis

Focus Question:

- "How can you justify your answer without solving both sides?"

• False. Answers vary. Sample response: 5 + 10 = 15 so one side has 20 and 27 and the other side has 15 and 27. • True. Answers vary. Sample response: 5 + 5 + 10 = 20 so both sides have 20 and 48.	Consider asking: • "Does anyone want to add on to _____ 's reasoning?"
Activity 1 Narrative: Building a Human Number Line	**Addressing CCSS:** 2.MD.B.6
The purpose of this activity is for students to reason together about the relative position of numbers on the number line. Students organize themselves into a human number line by arranging assigned numbers as they are called in a random order. As numbers are called, students consider placement of their numbers relative to the numbers previously positioned. By starting with the lowest and highest numbers in place, students can gauge where they would go based on their understanding of the number sequence. As more numbers are called, students revise their location to be more precise. Throughout the activity, reinforce the idea that numbers on the number line need to be equally spaced. For this activity, prepare number cards where the numbers are printed large enough to be seen by the class. The number cards are used for two separate rounds with different ranges of numbers. When distributing numbers, extend the ranges if you have a larger class size (more than 22). The goal is for every student to have the opportunity to participate.	
SwD Support Tags • Engagement	
SwD Support Text *Engagement: Develop Effort and Persistence.* Activity: Invite students to generate a list of shared expectations for group work. Record responses on a display and keep visible during the activity. *Supports accessibility for: Social-Emotional Functioning*	
Task Statement N/A	**Launch/Activity** • Groups of 10–12 • "Today, you are going to create a human number line." Round 1 • Give out cards 0–10. • "As I call out numbers, find your place on the number line." • Call out 0, 5, and 10 to start. • Call out other numbers 1 at a time, in a random order, and have the student

	stand where that number would be on the number line. ● As students organize themselves, discuss how students are gauging their placement. Round 2 ● Give out cards 20–30. ● Call out 20, 25, and 30 (the highest number). ● Have students with these numbers place themselves in the order they would appear on the number line. ● Call out numbers 1 at a time in a random order. ● The class helps each student place themselves based on proximity to other numbers. ● As students place themselves on the number line, ask "How did you decide where your number is located on the number line?" **Synthesis** ● "How did you adjust your location, as more numbers were called?" (Sometimes we had to make more room or move to a new place because the new number needed to fit in between numbers. The more numbers that were already on the number line, the easier it was to be precise.) ● 1 minute: quiet think time ● 1 minute: partner discussion ● Share responses.

Activity 2 Narrative: Analyzing Number Lines	**Addressing CCSS:** 2.MD.B.6, 2.NBT.A.2

The purpose of this activity is for students to analyze common mistakes made when creating number line diagrams. Students analyze number line diagrams that do not have equal spacing, have numbers written out of sequence, and have tick marks that are not labeled with a number. Students discuss what needs to be changed in order to make these number line diagrams accurate.

MLR Tags

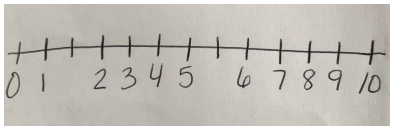
- MLR8 Discussion Supports

EL Support Text

MLR8 Discussion Supports Activity: Display sentence frames to support group discussion: "I noticed _____ so I . . . .". Also display the sentence frames:"I agree because . . .", "I disagree because . . . ."
Advances: Speaking, Conversing

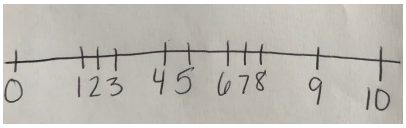
Task Statement

1. Jada



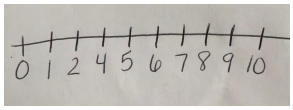
What should Jada do to fix her number line?

2.Andre



What should Andre do to fix his number line?

3. Elena

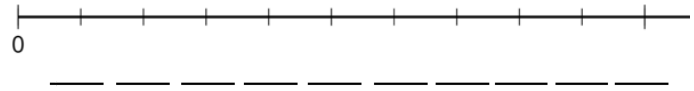


What should Elena do to fix her number line?

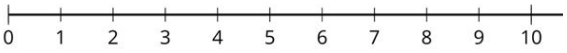
Launch/Activity

- Group size: 3
- "We just created human number lines. Now we are going to look at some number line diagrams that were created on paper. What do you remember about number lines that we should see in the number line diagrams we look at today?" (They should have numbers in order from left to right, they should have equal spacing.)
- "Jada, Andre, and Elena created number line diagrams. Look at each diagram and talk to your group about what you notice about each diagram."
- 5 minutes: group work time
- "All of the students need to revise their number lines. For each number line, write what they should do to fix it."
- 5 minutes: independent work time

4. Fill in the numbers to create your own number line.



Student Responses

1. Not all of the tick marks are labeled.
2. The spacing between the numbers is not equal.
3. There's no number 3.
4. 

Synthesis

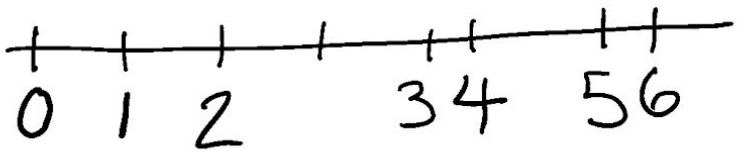
- Display Jada's number line diagram.
- "What did you notice about the number line?"
- Share responses.
- Repeat for each diagram.

Lesson Synthesis

"Today we created our own human number line and analyzed number line. What do we need to think about when creating number line?" (spacing the tick marks equally, writing the numbers in sequential order, labeling each tick mark with 1 number)
30 seconds: quiet think time
Share and record responses.

Mini-Assessment 3

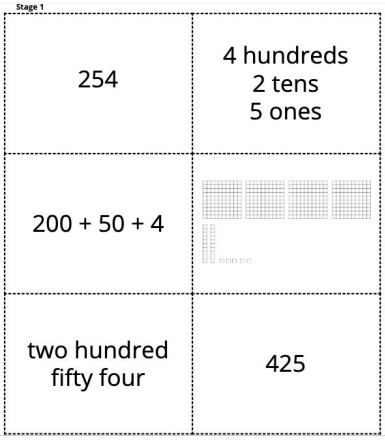
Diego made a number line.



Explain what Diego did wrong when he made his number line.

Center: Matching Representations 1, 2, and 3	
Unit 4: Working with Numbers to 1,000 and Understanding Money	**Center C**: Matching Representations: Three-digit Numbers
Addressing CCSS: 2.NBT.A.1, 2.NBT.A.3	
Center Narrative The **purpose** of this center is to give students practice recognizing numbers represented in different ways. Stage 1 focuses on the understanding that the 3 digits in a three-digit number represent hundreds, tens and ones, and that the value of each digit depends on its place in the number. Students use this understanding to match representations that display the value of the digits in order based on place value. In Stage 2, students recognize that the same number of hundreds, tens and ones will always represent the same number, regardless of the order in which they are represented. Finally in Stage 3, students match numbers represented with different amounts of hundreds, tens and ones.	
Stage Descriptions • **Stage 1:** Find 3 cards representing the same number when all values are in order based on place value. • **Stage 2:** Find 3 cards representing the same number with values in any order. • **Stage 3:** Find 3 cards representing the same number when the numbers are represented with different amounts of hundreds, tens and ones.	

Stage 1 - 3: Matching Representations - Three-digit Numbers	**Addressing CCSS:** 2.NBT.A.1. 2.NBT.A.3
Teacher-facing Learning Goals • Match numbers represented in different ways.	
Look fors: • Students begin with place value diagrams and look for other representations of the same number. • Students begin with numbers written out in words and look for other representations of the same number. • Students begin with three-digit numbers and look for other representations of the same number.	
Student-facing Learning Goal: Let's find matching numbers.	

Materials Needed	
Gather ● none	**Copy** ● Create a set of cards from 2.4 Center C Blackline Masters for each group.
Task Statement ● Find 3 cards representing the same number. ● Explain to your partner how you know they each represent the same number. 	**Center Directions** ● Groups of 2 ● Give each group a set of cards. ● Spread out all of the cards. ● Take turns finding 3 cards representing the same number. ● Explain to your partner how you know they each represent the same number. **Questions to ask during center** ● How do you know these represent the same number? ● How could these cards represent the same number if they show different amounts of hundreds?

Center: What's My Number 1
Center Narrative The purpose of this center is to give students practice thinking about numbers in different ways. Students have had a lot of experience working with numbers represented in different ways. In this activity, they identify numbers based on amounts of hundreds, tens and ones, as well as the value of their digits. In stage 2, students consider how they can describe numbers in different ways for their partner. Although stage 2 does not depend on stage 1, it would be helpful for students to have some experience with the types of clues that can be given about numbers, before being asked to give clues to their partner in stage 2. Students should have access to base-ten blocks during both stages.

Stage 1: What's My Number?	**Addressing CCSS:** 2.NBT.A
Stage Description ● **Stage 1:** Use clues to write the correct number.	

Teacher-facing Learning Goals

- Write a number based on clues about it's digits.

Look fors:

- Students determine where a digit belongs based on its value.
- Students determine the number when more than 9 tens or 9 ones are given in the clue.

Student-facing Learning Goal: Let's use clues to figure out the number.

Materials Needed

Gather

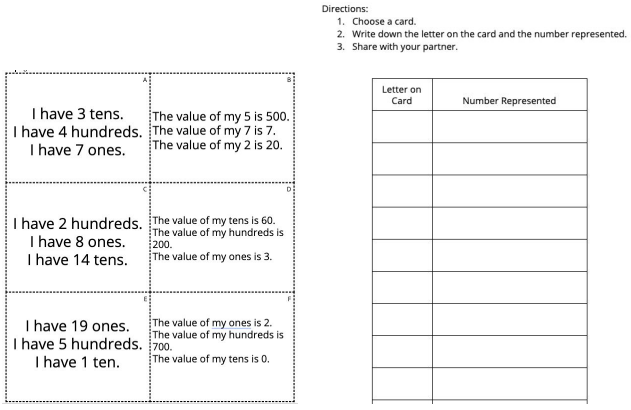
- base-ten blocks (as needed)

Copy

- Create a set of cards from 2.4 Center D Blackline Masters for each group.
- Copy recording sheet for each student

Task Statement

- Choose a card.
- Write down the letter on the card and the number represented.
- Share with your partner.



A	B
I have 3 tens. I have 4 hundreds. I have 7 ones.	The value of my 5 is 500. The value of my 7 is 7. The value of my 2 is 20.
C	**D**
I have 2 hundreds. I have 8 ones. I have 14 tens.	The value of my tens is 60. The value of my hundreds is 200. The value of my ones is 3.
E	**F**
I have 19 ones. I have 5 hundreds. I have 1 ten.	The value of my ones is 2. The value of my hundreds is 700. The value of my tens is 0.

Directions:

1. Choose a card.
2. Write down the letter on the card and the number represented.
3. Share with your partner.

Letter on Card	Number Represented

Center Directions

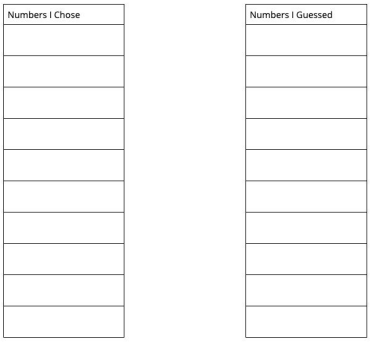
- Groups of 2
- Give each group a set of cards and recording sheets.
- Choose a card.
- Record the letter on the card.
- Read the clue and write down the number you think it describes.
- Share your number with your partner.
- If you disagree, work together to figure out the number.
- When both partners agree on the number, choose another card.

Questions to ask during center

- How did you know what the number was?
- What type of clue makes it easiest for you to figure out the number? Why?

Center: What's My Number 2
Center Narrative The purpose of this center is to give students practice thinking about numbers in different ways. Students have had a lot of experience working with numbers represented in different ways. In this activity, they identify numbers based on amounts of hundreds, tens and ones, as well as the value of their digits. In stage 2, students consider how they can describe numbers in different ways for their partner. Although stage 2 does not depend on stage 1, it would be helpful for students to have some experience with the types of clues that can be given about numbers, before being asked to give clues to their partner in stage 2. Students should have access to base-ten blocks during both stages.

Stage 2: What's My Number?	**Addressing CCSS:** 2.NBT.A
Stage Description • **Stage 2:** Give clues about your number to your partner to get them to write the same number.	
Teacher-facing Learning Goals • Create clues about a three-digit number based on its digits and their values. • Write the correct number based on clues about its digits.	
Look fors: • Students' clues are based on how many hundreds, tens and ones are in the number. • Students give clues about digits based on their value. • Students give clues that require composing (2 tens and 15 ones).	
Student-facing Learning Goal: Let's figure out each other's numbers.	
• **Materials Needed**	
Gather • base ten blocks (as needed)	**Copy** • none
Task statement • Write down a three-digit number. • Give your partner clues about each digit. • Check your partner's number to see if it is the same as yours. • Continue taking turns giving the clues and writing the number.	**Center Directions** • Groups of 2 • Give each group recording sheets. • Partner A writes down a three-digit number without letting their partner see. • Partner A gives clues about each digit in the number.



- Partner B writes down the number.
- Check to see if both numbers are the same.
- If not, review the clues that were given and work together to figure out the number.
- When both partners agree, switch roles.

Questions to ask during center

- How did you decide what clues to give your partner?
- What clues did your partner give that made it easiest to figure out their number?
- Was there any number you couldn't figure out or that you got wrong? Why was it hard to figure out?

2.8 Lesson 7: Add and Subtract within 1,000

Teacher-facing Learning Goals

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

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

Lesson Purpose

The purpose of this lesson is for students to add and subtract within 1,000 using methods based on place value. Students practice fluently adding and subtracting within 100 and explain the methods they use.

Materials Needed

Gather	**Copy**
• display image (warm-up)	• none

Cool-down: Add and Subtract within 1,000

1. Find each sum or difference.

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. Answers vary. Sample responses:
   - C because when you add 6 and 7 it makes a new 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 new ten. I thought of adding 56 + 4 = 60 and then 60 + 23 = 83.

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?

Access for Students with Disabilities	**Access for English Learners**
Activity 1: MLR7 Collect and Compare	Activity 1: Action and Expression

Warm-up Narrative: Which One Doesn't Belong: Add and Subtract within 100	**Addressing CCSS:** 2.NBT.B.5

This warm-up prompts students to compare four expressions. It gives students a reason to use language precisely (MP6).

Task Statement	**Launch/Activity**
Which one doesn't belong?	• Groups of 2 • Display image.

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 requires composing a ten.
- C is the only expression that has words.
- D is the only one that uses different digits.

- "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 Narrative: Which Would You Rather Find?

Building on CCSS: 2.NBT.B.5, 2.NBT.B.7

The purpose of this activity is for students to find sums and differences within 1,000. Students begin the activity by analyzing different expressions without finding the sums and differences 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 sums or differences.

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 the need to compose or decompose units. Discussing whether students need to compose or decompose units will support students in fluently finding sums and differences within 100 in the next activity.

SwD Support Tags

- Action and Expression

MLR Tags

- MLR7 Compare and Connect

EL Support Text

MLR7 Compare and Connect. Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask, "What kinds of additional details or language helped you understand the methods/strategies?", "Were there any additional details that you have questions about?"

Advances: Representing, Conversing

SwD Support Text

Action and Expression: Develop Expression and Communication. Synthesis: Identify connections between strategies that result in the same outcomes but use differing approaches.

Supports accessibility for: Conceptual Processing, Memory

Task Statement

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

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.

Launch/Activity

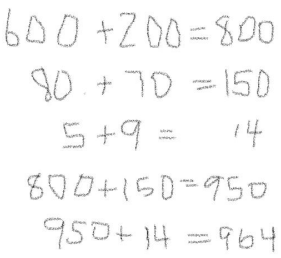
- Groups of 2
- "Without finding any of the sums or differences, read each expression and circle the two you think would be the most challenging to find the value of."
- 3 minutes: quiet work time
- "Choose one of the expressions you circled and find the value. Then choose 2 other expressions and find their value."
- 4 minutes: quiet work time
- "Share your work with your partner. Explain why you picked your expressions and the method you used to find the values."
- 4 minutes: partner discussion

Synthesis

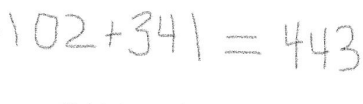
- Poll the class. For each expression, ask students to "Show one finger if the expression was not challenging, two fingers if it was a little challenging, or three fingers if it was the most challenging to find."
- Consider displaying:
  - A, D, E, F, H, J

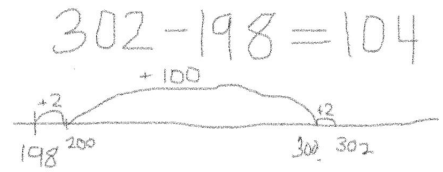
Student Responses

1. Answers vary. Sample response:



2. Answers vary. Sample responses:





- 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 Narrative: Add and Subtract within 100

Building on CCSS: 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 when solving, including mental strategies. In the synthesis, students reflect on which values were least and most challenging to find.

Task Statement

1. Find each sum or difference.

A 31 + 25	G 95 - 81
B	H

Launch/Activity

- Groups of 2
- "Now let's practice finding sums and differences with fluency."
- "Find the sums and differences. Use any method that makes sense to you. You do not need to show your work with a

43 + 28	37 + 55
C 89 - 22	I 25 + 25
D 40 - 28	J 63 - 19
E 15 + 72	K 72 - 68
F 85 - 37	L 21 + 59

2. Choose one value that you think was less challenging to find. Explain.

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

Student Responses

1.

A 31 + 25 = 56	G 95 - 81 = 14
B 43 + 28 = 71	H 37 + 55 = 92
C 89 - 22 = 67	I 25 + 25 = 50
D 40 - 28 = 12	J 63 - 19 = 54
E 15 + 72 = 87	K 72 - 68 = 4
F 85 - 37 = 48	L 21 + 59 = 80

representation or symbols, but be ready to share how you found each value."
- 5 minutes: quiet work time
- "Share your thinking with your partner. Find 1 sum or difference that you both felt was the least challenging and 1 sum or difference that you both feel was the most 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 they have to compose or decompose units or 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.
- Select 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.
- Select previously identified students to share different methods for finding the values.

2. Sample responses:
    - A was less challenging because I could just add the one and tens in my head.
    - I 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.

3. Sample responses:
    - F was more challenging because I tried to decompose a ten and then 15 - 8 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

Lesson Synthesis

"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.)
30 seconds: quiet think time
1 minute: partner discussion
Share responses.

"What methods did you hear from other students today that you want to try when adding or subtracting?"
30 seconds: quiet think time
1 minute: partner discussion
Share responses.

Center: Number Line Fill It Stage1	
Center Narrative Students take turns generating numbers and representing them on the number line.	
Stage 1: Fill it	**Addressing CCSS:** ● 2.MD.B.6
Materials to Gather: ● Sheet protectors ● Dry-erase markers ● Paper clips	**Materials to Copy:** ● Number Line Fill It Recording Sheet (30-60)_1 ● Number Line Fill It Double Spinners_1
Stage Narrative: The first student spins 2 spinners and creates a two-digit number. They have three choices about what to represent on their number line: - the number they created - 10 more than the number they created - 10 less than the number they created Players take turns representing numbers on the number line. The first player to have 3 consecutive numbers on their number line wins.	

Center: Number Line Fill It Stage 2	
Center Narrative Students take turns generating numbers and representing them on the number line.	
Stage 2: Get to 100	**Addressing CCSS:** ● 2.MD.B.6
Materials to Gather: ● Sheet protectors ● Dry-erase markers ● Paper clips	**Materials to Copy:** ● Number Line Get to 100 Recording Sheet ● Number Line Get to 100 Double (0-9) Spinners_1
Stage Narrative: The first student spins 2 spinners and creates a two-digit number and represents it on the number line. They figure out the number to add to get to 100 and represent the addition on their number line and write an equation. The student who makes the bigger jump to 100 wins a point.	

Prior-Grade Practice and Fluency Resources

Grade 2: Adding and Subtracting within 100 Number Talks

Grade 2 - Unit 1 - Adding and Subtracting with Data

Lesson 8	Lesson 9	Lesson 12	Lesson 14	Lesson 15
Find the value of each sum mentally. • 3 + 7 • 3 + 7 + 2 • 5 + 7 • 2 + 4 + 8	Is each statement true or false? Be prepared to explain your reasoning. • 9 + 4 = 9 + 1 + 3 • 9 + 4 = 10 + 3 • 9 + 5 = 10 + 6	Find the value of each sum mentally. • 4 + 8 + 2 • 4 + 5 + 3 + 2 • 9 + 3 + 1	Find the value of each expression mentally. • 8 + 2 • 18 + 2 • 18 + 5 • 23 - 5	Is each statement true or false? Be prepared to explain your reasoning. • 18 + 5 = 18 + 2 + 3 • 28 + 5 = 30 + 3 • 38 + 4 = 40 + 3

Grade 2 - Unit 2 - Measuring Length

Lesson 2	Lesson 4	Lesson 9	Lesson 11
Find the value of each sum mentally. • 7 + 3 • 7 + 13 • 7 + 33 • 17 + 23	Is each statement true or false? Be prepared to explain your reasoning. • 42 + 8 = 40 + 10 • 36 + 24 = 50 + 10 • 22 + 27 = 40 + 10	Find the value of each difference mentally. • 40 - 20 • 6 - 3 • 46 - 23 • 46 - 13	Is each statement true or false? Be prepared to explain your reasoning. • 10 + 20 + 4 = 14 + 20 • 35 = 20 + 10 + 5 • 30 + 10 = 10 + 10 + 10 • 47 = 30 + 17
Lesson 12	**Lesson 14**	**Lesson 15**	**Lesson 17**
Find the value of each sum mentally. • 10 + 6 • 9 + 6 • 9 + 4 • 8 + 5	Is each statement true or false? Be prepared to explain your reasoning. • 24 = 10 + 14 • 15 + 12 = 27 • 26 = 10 + 6 + 10 • 50 = 20 + 20 + 8	Find the value of each difference mentally. • 21 - 6 • 31 - 11 • 25 - 7 • 35 - 17	Find the value of each difference mentally. • 47 - 20 • 47 - 24 • 36 - 10 • 36 - 15

Lesson 18	Lesson 19	Lesson 22	Lesson 23
Find the value of each sum mentally. • 15 + 6 • 25 + 6 • 16 + 7 • 37 + 6	Is each statement true or false? Be prepared to explain your reasoning. • 10 - 0 = 12 - 2 • 8 - 4 = 10 - 6 • 15 - 2 = 13 - 0 • 12 - 4 = 10 - 3	Find the value of each sum mentally. • 5 + 5 • 15 + 5 • 15 + 15 • 15 + 25	Find the value of each difference mentally. • 25 - 10 • 35 - 10 • 35 - 20 • 35 - 19

Grade 2 - Unit 3 - Addition and Subtraction on the Number Line			
Lesson 2 Is each statement true or false? Be prepared to explain your reasoning. • 5 + 27 + 5 = 10 + 27 • 20 + 27 = 27 + 5 + 10 • 20 + 48 = 5 + 48 + 10 + 5	Lesson 4 Find the value of each difference mentally. • 35 - 5 • 35 - 10 • 35 - 15 • 35 - 25	Lesson 8 Find the value of each expression mentally. • 20 + 15 • 35 - 15 • 25 + 15 • 40 - 15	Lesson 9 Find the value of each difference mentally. • 20 - 2 • 20 - 17 • 49 - 3 • 67 - 64
Lesson 11 Find the sum mentally. • 32 - 6 • 43 - 8 • 51 - 5 • 52 - 7	Lesson 12 Find the value of each difference mentally. • 65 - 25 • 65 - 27 • 55 - 17 • 46 - 18	Lesson 15 Find the value of each sum mentally. • 44 + 20 • 44 + 19 • 63 + 30 • 63 + 28	Lesson 16 Is each statement true or false? Be prepared to explain your reasoning. • 28 = 30 - 2 • 45 + 28 = 45 + 30 - 2 • 26 + 19 = 26 + 20 + 1

Center: How Close? Stage 1	
Center Narrative Students pick a given number of digit cards and then choose a subset of those to make an equation that yields a number as close as possible to the target number. Students remove the cards that show the number 10 before playing.	
Stage 1: Close to 20	**Addressing CCSS:** ● 2.OA.B.2
Materials to Gather: ● none	**Materials to Copy:** ● Center Blackline Masters Number Cards (0–10), 1 set per 2 students ● Center Blackline Masters How Close? Close to 20 (Stage 1)
Stage Narrative: Students pick 7 cards and choose 3 of them to write an equation with 3 addends. Students compare their sums and the partner who is closer to 20 wins.	

Center: How Close? Stage 2	
Center Narrative Students pick a given number of digit cards and then choose a subset of those to make an equation that yields a number as close as possible to the target number. Students remove the cards that show the number 10 before playing.	
Stage 2: Close to 50	**Addressing CCSS:** ● 2.NBT.B.5
Materials to Gather: ● none	**Materials to Copy:** ● Number Cards (0–10), 1 set per 2 students ● How Close? Close to 50 (Stage 2)
Stage Narrative: Students pick 7 cards and choose 4 of them to create 2 two-digit numbers. Students find the sum and the partner who is closer to 50 wins.	

Center: How Close? Stage 3	
Center Narrative Students pick a given number of digit cards and then choose a subset of those to make an equation that yields a number as close as possible to the target number. Students remove the cards that show the number 10 before playing.	
Stage 3: Close to 100	
Addressing CCSS: ● 2.NBT.B.5	
Materials to Gather: ● none	**Materials to Copy:** ● Number Cards (0–10) ● How Close? Close to 100 (Stage 3)
Stage Narrative: Students pick 7 cards and choose 4 of them to create 2 two-digit numbers. Students find the sum and the partner who is closest to 100 wins.	

Center: What's Behind My Back Stage 4	
Center Narrative One partner shows their partner a tower or towers of cubes. They put the cubes behind their back, break off some cubes, and show their partner the rest of the cubes. The other partner figures out how many cubes are behind their partner's back.	
Stage 4: 20 Cubes	
Addressing CCSS: ● 2.OA.B.2	
Materials to Gather: ● 20 connecting cubes per student	**Materials to Copy:** ● What's Behind My Back, 20 Cubes_4
Stage Narrative: Students work with 20 cubes, organized into two towers of 10 cubes. Students record an addition equation with a blank to represent the missing cubes, before figuring out how many are behind their partner's back.	

Center: Number Puzzles Stage 2	
Center Narrative Students use the number cards 0–9 to fill in the number that makes each equation true. Each number may only be used one time to make all of the equations true. Students remove the 10s from the card deck.	
Stage 2: Up to 20	
Addressing CCSS: ● 2.OA.B.2	
Materials to Gather: ● none	**Materials to Copy:** ● Number Puzzles, Up to 20_2 ● Number Cards (0–10)
Stage Narrative: Students use number cards to fill in addition and subtraction equations up to 20. The missing values are in different places in the equations.	

Center: Number Puzzles Stage 3	
Center Narrative Students use the number cards 0–9 to fill in the number that makes each equation true. Each number may only be used one time to make all of the equations true. Students remove the 10s from the card deck.	
Stage 3: Up to 100	
Addressing CCSS: ● 2.OA.B.2	
Materials to Gather: ● none	**Materials to Copy:** ● Number Puzzles, Up to 100_3 ● Number Cards (0–10)
Stage Narrative: Students use number cards to fill in addition and subtraction equations up to 100. The missing values are in different places in the equations.	

<table>
<tr><td colspan="2">Center: Less Than Ten Stages 1 and 2</td></tr>
<tr><td>Stages 1-2: Less Than Ten</td><td>Building Towards CCSS: 2.NBT.B.5</td></tr>
<tr><td colspan="2">Teacher-facing Learning Goals
Practice subtracting within 50 or 100.</td></tr>
<tr><td colspan="2">Look fors:
Students use base ten blocks to solve subtraction problems.
Students use drawings to subtract.
Students use mental strategies to subtract.
Students decompose a ten when needed.</td></tr>
<tr><td colspan="2">Student-facing Learning Goal: Let’s decompose to subtract.</td></tr>
<tr><td colspan="2">Required Materials:
recording sheet
spinners
paper clips
base ten blocks, as needed</td></tr>
<tr><td>Student-facing Directions and Task</td><td>Teacher Directions</td></tr>
<tr><td>Task statement
Spin.
Subtract.
Write an equation.</td><td>Center Directions
Groups of 2
Give each group a spinner, paper clip, access to base ten blocks, and 2 recording sheets
Use a pencil and paperclip to create a spinner
Both partners start with 50 (Stage 1) or 99 (Stage 2).
Spin the spinner to find out how much to subtract
Subtract that number. You may need to decompose a ten to solve some problems
Write an equation to represent the problem
Use the difference from that problem as your starting number in the next problem. Spin again and subtract that number</td></tr>
</table>

	• Take turns with your partner spinning, subtracting and writing equations. The first person to get to fewer than 10 wins. **Questions to ask during center** • How did you subtract? • Do you need to use base-ten blocks to subtract? Is there another way you could represent and solve the problem?

Extension and Exploration Resources

IM Task: Classroom Supplies

Task

Your teacher was just awarded $1,000 to spend on materials for your classroom. She asked all 20 of her students in the class to help her decide how to spend the money. Think about which supplies will benefit the class the most.

Supplies	Cost
A box of 20 markers	$5
A box of 100 crayons	$8
A box of 60 pencils	$5
A box of 5,000 pieces of printer paper	$40
A package of 10 pads of lined paper	$15
A box of 50 pieces of construction paper	$32
Books and maps	Cost
A set of 20 books about science	$250

A set of books about the 50 states	$400
A story book (there are 80 to choose from)	$8
A map: there is one of your city, one for every state, one of the country, and one of the world to choose from	$45
Puzzles and games	Cost
Puzzles (there are 30 to choose from)	$12
Board games (there are 40 to choose from)	$15
Interactive computer games (math and reading)	$75
Special Items	Cost
A bean bag chair for the reading corner	$65
A class pet	$150
Three month's supply of food for a class pet	$55
A field trip to the zoo	$350

a. Write down the different items and how many of each you would choose. Find the total for each category.
   - Supplies
   - Books and maps
   - Puzzles and games
   - Special items

b. Create a bar graph to represent how you would spend the money. Scale the vertical axis by $100. Write all of the labels.

c. What was the total cost of all your choices? Did you have any money left over? If so, how much?

d. Compare your choices with a partner. How much more or less did you choose to spend on each

category than your partner? How much more or less did you choose to spend in total than your partner?

IM Commentary

The purpose of this task is for students to "Solve problems involving the four operations" (3.OA.A) and "Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories" (3.MD.3). Additionally, students will engage in MP3, Model with mathematics. In this task students are asked to decide how to spend $1,000 on supplies and materials for their classroom; students will have to make choices and be careful not to exceed the budget. Students are asked to decide which supplies will benefit the class the most and will compare their choices with other students' choices. Because the budget does not allow students to buy one of everything, this task provides an opportunity for teachers to discuss costs and benefits. A benefit is something that satisfies your wants. A cost is what you give up when you decide to do something.

In third grade, students are asked to fluently add and subtract within 1,000 (3.NBT.3) which is why the total budget is $1,000. Students are also multiplying and dividing within 100 (3.OA.7), so they might choose, for example, to buy 20 boxes of markers at $5 each so that there is a box of markers for every student in the class. It is possible that students will choose to purchase a number of one of the items where the total is greater than $100; while students are not expected to be fluent in multiplication above 100, they should be able to use their multiplication strategies to find such products. This task provides students with a natural opportunity to use addition, subtraction, and multiplication, and they might also use division depending on how they approach the task; thus it is well aligned to 3.OA.8.

Bar graphs make it easy for students to compare their allocations. If all of the students in the class include all categories on their graphs (whether they allotted any spending to them or not), list the categories in the same order that they are listed in the data table, and use the same colors for each category on a final draft, the teacher can put all of the final graphs up for display and the class can see whether there is a general consensus for how to spend the $1000 or not.

Materials

Blackline Master - IM Task: Classroom Supplies

Solutions

a. Solutions will vary. Here is one possible set of choices.

Supplies	Cost per item	Number of items	Total cost

A box of 20 markers	$5	8	$40
A box of 100 crayons	$8	4	$32
A box of 60 pencils	$5	2	$10
A box of 5,000 pieces of printer paper	$40	1	$40
A package of 10 pads of lined paper	$15	2	$30
A box of 50 pieces of construction paper	$32	3	$96
Books and maps	Cost per item	Number of items	Total cost
A set of 20 books about science	$250	1	$250
A set of books about the 50 states	$400		
A story book (there are 80 to choose from)	$8	12	$96
A map	$45	1	$45
Puzzles and games	Cost per item	Number of items	Total cost
Puzzles (there are 30 to choose from)	$12	10	$120
Board games (there are 40 to choose from)	$15	6	$90
Interactive computer games (math and reading)	$75		
Special Items	Cost per item	Number of items	Total cost
A bean bag chair for the reading corner	$65	2	$130
A class pet	$150		
Three month's supply of food for a class pet	$55		
A field trip to the zoo	$350		

- 8 boxes of markers will cost $8 \times 5 = 4 \times 2 \times 5 = 4 \times 10 = 40$ dollars.

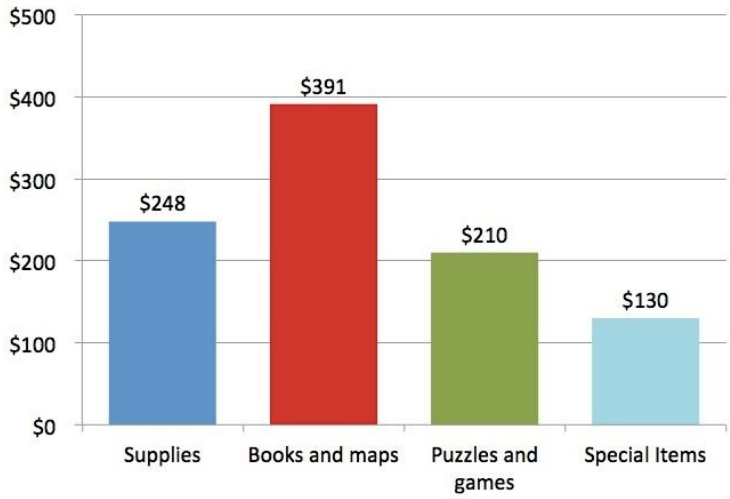
4 boxes of crayons will cost 4 × 8 = 4 × 4 × 2 = 16 × 2 = 10 × 2 + 6 × 2 = 20 + 12 = 32 dollars.
2 boxes of pencils will cost 2 × 5 = 10 dollars.
1 box of printer paper costs 40 dollars.
2 packages of lined paper cost 2 × 15 = 2 × 10 + 2 × 5 = 20 + 10 = 30 dollars.
3 boxes of construction paper cost 3 × 32 = 3 × 30 + 3 × 2 = 90 + 6 = 96 dollars.
The total for the supplies is 40 + 32 + 10 + 40 + 30 + 96 = 248 dollars.

- 12 books cost 12 × 8 = 10 × 8 + 2 × 8 = 80 + 16 = 96 dollars.
  The total cost for the books and maps is 250 + 96 + 45 = 391 dollars.

- The total cost for the puzzles and games is 10 × 12 + 6 × 15 = 120 + 3 × 30 = 120 + 90 = 210 dollars.

- The total for the special items is 130 dollars.

b. Here is a bar graph showing these



c. The total from all the purchases would be 248 + 391 + 210 + 130 = 979 , so these purchases would total $979 and $21 would be left over.

d. Comparisons will vary.

2.8 Lesson 5: Composing and Decomposing Numbers within 1,000

Teacher-facing Learning Goals

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

Addressing CCSS: 2.NBT.A

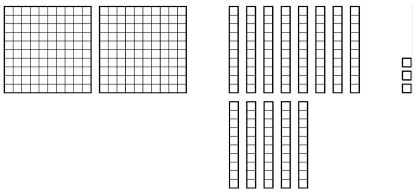
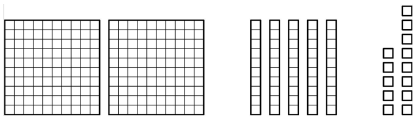
Lesson Purpose
The **purpose** of this lesson is for students to compose and decompose three-digit numbers in different ways.

Materials Needed

Gather	**Copy**
• display image (Activity 1 synthesis) • base-ten blocks • chart paper, 1 for each group of 3–4 students • markers	• none

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.

Student Responses
1. B, C
2. Sample responses:
   - 1 hundred + 16 tens + 3 ones
   - 200 + 60 + 3

Teacher Reflection Question
What representations did most students use today? Which representations surprised you? What did students show you they understood about place value and representing numbers?

Lesson Narrative

In unit 4 and unit 6, students represented three-digit numbers by composing and decomposing units using base ten blocks, place value diagrams, and equations.

The purpose of this lesson is for students to compose and decompose three-digit numbers using familiar representations. Throughout the lesson, students are encouraged to show and deepen their understanding of place value by composing and decomposing units.

Student-facing Learning Goal: Let's represent numbers in many different ways.

Warm-up Narrative: What Do You Know About 308?	**Addressing CCSS:** 2.NBT.A, 2.NBT.A.1
10 min	The purpose of this What Do You Know About ____? is to invite students to share what they know and how they can represent the number 308.

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.
- 308 is 300 + 8.

Launch/Activity

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

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 Narrative: How Many Did You Get?	**Addressing CCSS:** 2.NBT.A, 2.NBT.A.1
15 min	The purpose of this activity is for students to represent numbers in different ways. The structure of the task encourages students to practice both composing units and decomposing units and using concrete and abstract representations.

Task Statement

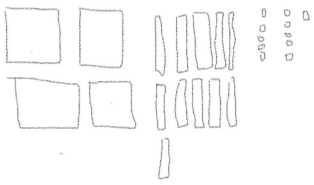
1. Start with 2 hundreds. Grab a handful of tens and a handful of ones.
    a. What number do your base-ten blocks represent?
    b. Represent the same number in another way. Show your thinking using diagrams, symbols, or other representations.
2. Combine your blocks with your partner's blocks.
    a. 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

Launch/Activity

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

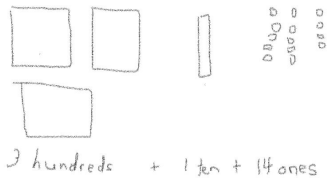
Synthesis

- Display a picture or drawing of a group's blocks from the beginning of question 2 or display:



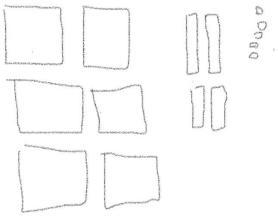
- "How could this group represent their number in another way?" (trade 1 of the tens for 10 ones, trade 10 tens for 1 hundred)
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share responses.

Student Responses

1. Sample response:
   a. 324
   b. 

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

- Display a picture or drawing of a group's blocks that uses the fewest blocks, or display:



- "How could this group represent their number in another way?" (trade 1 of the hundreds for 10 tens, trade 1 ten for 10 ones, trade all the tens for 40 ones)
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share responses.

Activity 2 Narrative: Let Me Count the Ways

Addressing CCSS: 2.NBT.A, 2.NBT.A.1

20 min

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 the number that make use of the structure of place value 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.

Task Statement

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

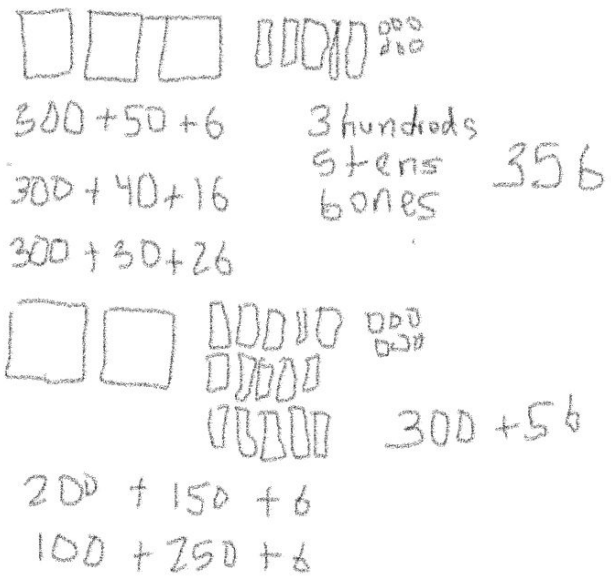
2. Create a poster to show 356 in different ways with your group.

Launch/Activity

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

Student Responses

Answers vary. Sample group response:



- "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 new ways to represent the number."
- 5 minutes: group work time
- "You are going to rotate to see each other group's poster. 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.)
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share responses.
- "This is one way we could show 356 as an expression. What other ways did you see groups represent 356 as an expression?"
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share and record responses.
- "How are the expressions alike? How are they different?" (They all show 356. Some expressions have different amounts of hundreds,

	tens. Some expressions use words.) ● 30 seconds: quiet think time ● 1 minute: partner discussion ● Share responses.

Lesson Synthesis

"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.)
30 seconds: quiet think time
1 minute: partner discussion
Share responses.

2.8 Lesson 6: Represent Numbers with Expressions

Teacher-facing Learning Goals

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

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

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. Students find the missing values that make expressions equal and match expressions that represent the same number.

Materials Needed

Gather	**Copy**
• base-ten blocks • (optional) scissors, 1 per student	• none

Cool-down: Think of a Time

Think of 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.

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?

Lesson Narrative

In this lesson, students practice using place value reasoning to compose and decompose units to find missing values and create equivalent forms of three-digit numbers. Although students should have access to base-ten blocks and tools to create place value diagrams as needed, students should be encouraged to reason mentally. 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.

Student-facing Learning Goal: Let's compose and decompose numbers to make equal expressions.

Warm-up Narrative: True or False: Place Value	**Addressing CCSS:** 2.NBT.A.1
10 min	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 will need to be able to find ways to make equations true by attending to place value.

Task Statement

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

Launch/Activity

- Display one problem.
- "Give me a signal when you know whether the equation is true and can explain how you know."
- 1 minute: quiet think time
- Share and record answers and strategy.
- Repeat with each problem.

Synthesis

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

Activity 1 Narrative: Make Equations True		**Addressing CCSS:** 2.NBT.A.1
20 min	The purpose of this activity is for students to use their understanding of place value to find missing values. Students must consider how units may be composed or decomposed to find the missing value. 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 2 compositions or decompositions.	

Task Statement

Find the missing value.

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

Are You Ready For More?

9. 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

Launch/Activity

- Groups of 2
- Give students access to base ten blocks.
- 5 minutes: independent work time
- "Take turns to share your thinking with your partner. Show or explain how you know each side of the equation shows the same number."
- 3 minutes: partner discussion
- For question 7, monitor for students who:
  - explain by using base-ten blocks or place value diagrams
  - explain how they noticed when there would be more than 1 composition or decomposition

Synthesis

- Select previously identified students to share their method for finding the missing value in question 7.
- 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?"

<table>
<tr><td>8. 15
9. Answers vary.</td><td>○ “Did you have to compose or decompose units? Did you have to compose or decompose more than 1 time?”</td></tr>
<tr><td>Activity 2 Narrative: Matching Expressions</td><td>Addressing CCSS: 2.NBT.A.1, 2.NBT.A.3</td></tr>
<tr><td colspan="2">15 min

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.

This task can be completed as a card sort. Students may cut out the expressions and sort them to identify matches.</td></tr>
<tr><td>Task Statement

Match the expressions that have the same value. Write one more expression that represents the same number.

<table>
<tr><td>A

300 + 50 + 15</td><td>B

6 hundreds + 12 tens + 21 ones</td><td>C

600 + 140 + 1</td></tr>
<tr><td>D

600 + 20 + 1</td><td>E

300 + 50 + 5</td><td>F

3 hundreds + 4 tens + 25 ones</td></tr>
<tr><td>G

3 hundreds + 3 tens + 25 ones</td><td>H

200 + 150 + 15</td><td>I

5 hundreds + 12 tens + 1 one</td></tr>
<tr><td>J

600 + 120 + 21</td><td>K

500 + 100 + 21</td><td>L

200 + 130 + 25</td></tr>
</table>
</td><td>Launch/Activity

Groups of 2
“Work with your partner to find three expressions that have the same value.”
“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 B, C, and J.
“Do these expressions match? Explain.”
30 seconds: quiet think time
1 minute: partner discussion
Share responses.
“What other expressions did you write that match these expressions?”
If time, consider asking: “What other expressions could you write to match these expressions?”
30 seconds: quiet think time
Share responses.

</td></tr>
</table>

1. Matching Expressions: New Expression: 2. Matching Expressions: New Expression: 3. Matching Expressions: New Expression: 4. Matching Expressions: New Expression: **Student Responses** Sample responses: 1. A-F-H. 300 + 60 + 5 2. E-G-L. 300 + 40 + 15 3. B-C-J. 700 + 40 + 1 4. D-I-K. 600 + 10 + 11	
Lesson Synthesis "Share your work from the cool-down." 1 minute: partner discussion Share responses.	

2.8 Lesson 9: Make Your Own Number Talk
Teacher-facing Learning Goals • Add and subtract within 100 fluently. • Explain why methods for adding and subtracting within 100 work.
Building on CCSS: 2.NBT.B.5, 2.NBT.B.9
Lesson Purpose The purpose of this lesson is for students to apply their understanding of addition and subtraction to

create a Number Talk activity.
Materials Needed

Gather	**Copy**
• none	• none

Cool-down: Looking for Patterns

Mathematicians look for patterns and things that repeat over and over.

When did you find a pattern today? What did you notice?

Student Responses
Answers vary. Sample response: When I was making Number Talks I was looking for ways each expression was alike. I was looking for ways someone could use the same method to find each value.

Teacher Reflection Question
What did you learn about students' mathematical understandings today as you listened to their discussions?

Lesson Narrative

This lesson offers teachers the opportunity to listen to ways in which students make use of structure and repeated reasoning to design a Number Talk. Students may come up with different expressions to use in the Number Talk, which is fine. The point of the lesson is not to design the perfect Number Talk, but instead for students to reason about the structure of numbers.

After the warm-up, four activities are given, but it is not expected that students do all four. As the activities progress, there is one additional problem missing from each Number Talk. The choice of which activities to use is left to the teacher based on how much scaffolding the students may need. This lesson can take 1–2 days if students facilitate their creations with other groups.
The cool-down should be completed before the Lesson Synthesis so that students can share their responses during the Lesson Synthesis.

Student-facing Learning Goal: Let's create a Number Talk.

Warm-up Narrative: Number Talk: Addition		**Addressing CCSS:** 2.NBT.B.7
10 min	The purpose of this Number Talk is to elicit strategies and understandings students have for adding within 1,000. These understandings help students develop fluency and will be helpful	

	later in this lesson when students will develop their own Number Talk activity. In this activity, students have an opportunity to look for and make use of structure (MP7) because they consider how place value can be used to add. In the synthesis students discuss things the writer had to pay attention to when they designed this activity to prepare them for the work in the rest of the lesson.

Task Statement Find the value of each sum mentally. 20 + 50 300 + 400 320 + 450 324 + 455 **Student Responses** • 70: I know that 2 tens and 5 tens is 7 tens. I just know it. • 700: I know that 3 hundreds and 4 hundreds is 7 hundreds. • 770: I added the hundreds to get 700, and the tens to get 70. The sum is 770. • 779: I added the hundreds, the tens, then the ones to get 779.	**Launch/Activity** • Display one problem. • "Give me a signal when you have an answer and can explain how you got it." • 1 minute: quiet think time • Record answers and strategy. • Keep problems and work displayed. • Repeat with each problem. **Synthesis** • **"**What did the writer of this activity have to pay attention to when they designed this activity?" • "Where do we see those things in how the expressions change during the Number Talk?"

Activity 1 Narrative: Design 1	**Addressing CCSS:** 2.NBT.B.5

15 min	The purpose of this activity is for students to reason about subtraction to create one new expression to a partially-completed Number Talk activity. If there is time, students can facilitate their Number Talk with another group.

Task Statement Write an expression to complete the Number Talk.	**Launch/Activity** • Groups of 2 or 4 • "Now you will work with your

60 - 40 60 - 39 50 - 39 _____ **Student Responses** Answers vary. Sample responses: • 50 - 38. I changed the 39 to be one less. It's still close to 40, so you can think about taking away 40, but add 2 more. • 40 - 39. I changed the 50 to be 40. You can think about how the difference is 10 less than before. It's 11 instead of 21. • 60 29. I changed the 50 to 60 and the 39 to 29. You can think about taking away 30 and adding 1.	group to complete a Number Talk activity. This activity has 1 expression missing. First, find the difference of each expression. Then, decide on an expression that could complete the Number Talk and write it on the blank line." • 10 minutes: small group work time • As students work, monitor for groups who discuss and design an expression based on some of the following: ○ They adjust the 39 to a different number, but keep the 50. ○ They leave the 39, but adjust the 50. ○ They adjust the 50 and the 39, but create a problem where a similar strategy can be used. **Synthesis** • Selected groups share different reasons for their fourth expression. • Ask students to share their completed Number Talk and ask the class to share reasons for the last expression. • As each group shares, continually ask others in the class if they agree or disagree and the reasons why.
Activity 2 Narrative: Design 2	**Addressing CCSS:** 2.NBT.B.5

15 min	The purpose of this activity is for students to reason about the relationship between addition and subtraction to create two new expressions for a partially-completed Number Talk activity. If there is time, students can facilitate their Number Talk with another group.

Task Statement

Write expressions to complete the Number Talk.

54 + 19
73 - 54
_____
_____

Student Responses

Answers vary. Sample responses:

- 73 - 19, 19 + 54. I made 2 more expressions that use the same 3 numbers that are in the first 2 expressions.
- 56 + 29, 85 - 56. I made 2 more expressions that are like the first two. You have to add, then subtract. The sum of the first expression is the first number in the second expression.

Launch/Activity

- Groups of 2 or 4
- "Now you will work with your group to complete a Number Talk activity. This activity has 2 expressions missing. First, find the difference of each expression. Then, decide on expressions that would complete the Number Talk and write them in the blank lines."
- 10 minutes: small group work time
- As students work, monitor for groups who discuss and design expressions based on some of the following:
  - They leave the 73, but adjust the 54 to 19.
  - They leave the 54, but adjust the 73 to 19 and change the expression to addition.
  - They adjust the 54 and the 19, but create two new expressions that follow the same pattern as the first two.

Synthesis

- Selected groups share different reasons for their expressions.
- Ask students to share their completed Number Talk and ask the class to share reasons for their expressions.
- As each group shares, continually

<table>
<tr><td colspan="2"></td><td>ask others in the class if they agree or disagree and the reasons why.</td></tr>
<tr><td colspan="2">Activity 3 Narrative: Design 3</td><td>Addressing CCSS: 2.NBT.B.5</td></tr>
<tr><td>15 min</td><td colspan="2">The purpose of this activity is for students to reason about subtraction to create three new expressions to a partially-completed Number Talk activity. If there is time, students can facilitate their Number Talk with another group.</td></tr>
<tr><td colspan="2">Task Statement
Write expressions to complete the Number Talk.

90 - 40
_____
_____
_____

Student Responses
Answers vary. Sample responses:
• 92 - 40, 95 - 40, 52 - 40. I changed the first number but kept subtracting 40. You can take away 4 tens each time.
• 90 - 39, 90 - 29, 90 - 19. I only changed the second number. You can think about taking away 40 and add 1, then take away 30 and add 1, and then take away 20 and add 1.
• 80 - 40, 40 - 30, 60 - 20. I changed the numbers but they are all differences you can find by taking away tens from tens.</td><td>Launch/Activity
• Groups of 2 or 4
• “Now you will work with your group to complete a Number Talk activity. This activity has 3 expressions missing. Decide on expressions that would complete the Number Talk and write them on the blank lines.”
• 10 minutes: small group work time
• As students work, monitor for groups who discuss and design expressions based on some of the following:
  ○ They adjust the 90 to emphasize a certain strategy.
  ○ They adjust the 40 to emphasize a certain strategy.
  ○ They make slight adjustments throughout the Number Talk, but keep problems that use a certain strategy.
Synthesis
• Selected groups share different reasons for their expressions.
• Ask students to share their completed Number Talk and ask the class to share reasons for their expressions.</td></tr>
</table>

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<tr><td colspan="2"></td><td>

- As each group shares, continually ask others in the class if they agree or disagree and the reasons why.

</td></tr>
<tr><td colspan="2">Activity 4 Narrative: Design 4</td><td>Addressing CCSS: 2.NBT.B.5</td></tr>
<tr><td>15 min</td><td colspan="2">The purpose of this activity is for students to reason about subtraction to add two expressions to a partially-completed Number Talk activity. If there is time, students can facilitate their Number Talk with another group.</td></tr>
<tr><td colspan="2">

Task Statement

Write expressions to complete the Number Talk.

_____

_____

_____

_____

Student Responses

Answers vary. Sample responses:

- 324 + 300, 324 + 20, 234 + 4, 234 + 325. I made a number talk that first adds some hundreds, then some tens, then some ones, then adds them as one number.
- 85 - 20, 85 - 19, 850 - 200, 850 - 199. I made a number talk to practice thinking about numbers that are close to help subtract.
- 30 - 29, 50 - 48, 70 - 67, 72 - 69. I made a number talk with numbers that are close together on the number line, so you can think about counting up.

</td><td>

Launch/Activity

- Groups of 2 or 4
- “Now you will work with your group to complete a Number Talk activity. This activity has all the expressions missing. Decide on expressions that would complete a Number Talk and write them on the blank lines.”
- 10 minutes: small group work time
- As students work, monitor for groups who discuss and design expressions based on a clear theme such as:
  - adding hundreds to hundreds, tens to ten, and ones to one
  - using place value benchmarks like a multiple of 100 or 10 to make adding or subtracting easier
  - adding on to find difference

Synthesis

- Selected groups share different reasons for their expressions.
- Ask students to share their completed Number Talk and ask the class to share reasons for their expressions.

</td></tr>
</table>

	• As each group shares, continually ask others in the class if they agree or disagree and the reasons why.
Lesson Synthesis "Share your work from the cool-down." 1 minutes: partner discussion Share responses.	