

Course Title: Mathematics	Full Year	Required
<p>Course Description: The big ideas in grade 2 include: extending understanding of the base-ten number system, building fluency with addition and subtraction, using standard units of measure, and describing and analyzing shapes. The mathematical work for grade 2 is partitioned into 9 units:</p> <ol style="list-style-type: none"> 1. Adding, Subtracting, and Working with Data 2. Adding and Subtracting within 100 3. Measuring Length 4. Addition and Subtraction on the Number Line 5. Numbers to 1,000 6. Geometry, Time, and Money 7. Adding and Subtracting within 1,000 8. Equal Groups 9. Putting it All Together <p>In these materials, particularly in units that focus on addition and subtraction, teachers will find terms that refer to problem types, such as Add To, Take From, Put Together or Take Apart, Compare, Result Unknown, and so on. These problem types are based on common addition and subtraction situations, as outlined in Table 1 of the Mathematics Glossary section of the Common Core State Standards.</p>		
<p>Additional Course Information:</p> <p>The big ideas in Grade 2 include:</p> <ul style="list-style-type: none"> ● Representing and solving problems involving addition and subtraction ● Adding and subtracting within 20 ● Understanding place value ● Using place value understanding and properties of operations to add and subtract ● Measuring and estimating lengths in standard units ● Relating addition and subtraction to length <p>Required fluency in grade 2 includes:</p> <ul style="list-style-type: none"> ● Single-digit sums and differences (sums from memory by end of Grade 2) ● Add/subtract within 100 	<p>Core Resources:</p> <p>Illustrative Mathematics</p> <p>Instructional Routines and Math Language Routines</p> <p>Glossary - Student-friendly</p> <p>Required Materials</p> <p>IM en Español:</p> <p>Developing a Mathematical Community</p>	<p>Are there any attachments <u>at the course level</u> that teachers will need?</p> <p>Scope and Sequence This document should be reviewed at the start of the year and each unit for information on language routines, expectations, and possible misconceptions.</p> <p>Pacing Guide and Dependency Diagrams K-5</p>

Unit 5: Numbers to 1,000

Duration: 14-15 days

Unit Overview - FOCUS:

Unit Learning Goals

- Students extend place value understanding to three-digit numbers.

In this unit, students extend their knowledge of the units in the base-ten system to include hundreds.

In grade 1, students learned that a ten is a unit made up of 10 ones, and two-digit numbers are formed using units of tens and ones. Here, they learn that a hundred is a unit made up of 10 tens, and three-digit numbers are formed using units of hundreds, tens, and ones.

To make sense of numbers in different ways and to build flexibility in reasoning with them, students work with a variety of representations: base-ten blocks, base-ten diagrams or drawings, number lines, expressions, and equations.



At the start of the unit, students express a quantity in terms of the number of units represented by base-ten blocks (3 hundreds, 14 tens, 22 ones). They practice composing larger units from smaller units and representing the value using the fewest number of each unit (4 hundreds, 6 tens, 2 ones). They connect the number of units to three-digit numerals (462).

Next, students make sense of three-digit numbers on the number line. In a previous unit, students learned about the structure of the number line by representing whole numbers within 100 as lengths from zero. Here, they get a sense of the relative distance of whole numbers within 1,000 from zero. Students learn to count to 1,000 by skip-counting on a number line by 10 and 100. They also locate, compare, and order three-digit numbers on a number line.

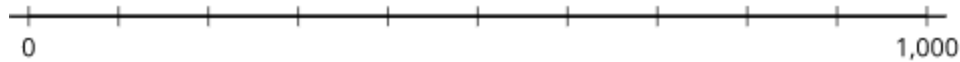
Topic Titles:

• Section A: The Value of Three Digits

- Read, write, and represent three-digit numbers using base-ten numerals and expanded form.
- Use place value understanding to compose and decompose three-digit numbers

• Section B: Compare and Order Numbers within 1,000

- Compare and order three-digit numbers using place value understanding and the relative position of numbers on a number line.
- Represent whole numbers up to 1,000 as lengths from 0 on a number line.



Throughout the unit, the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 are referred to as multiples of 100 for simplicity. The same is true for multiples of 10. “Multiple” is not a word that students are expected to understand or use in grade 2. Students can describe the numbers as some number of tens or hundreds, such as “20 tens” or “3 hundreds.”

Coherence: How does this unit build on and connect to prior knowledge and learning?

In grade 1, students were introduced to a ten as a unit made of 10 ones. They used that understanding to represent two-digit numbers and add within 100. Students used connecting cubes to make and break apart two-digit numbers. In previous units in grade 2, students used the words compose and decompose as they made and broke apart tens when they added and subtracted within 100. In previous units, students used base-ten blocks and diagrams to compose and decompose tens when adding and subtracting by place. In grade one, students read, wrote, and compared two-digit numbers based on the meaning of tens and ones. They used the symbols $<$, $>$, $=$ to compare two-digit numbers. In this unit, students continue to use the number line as a tool for sequencing numbers and visualizing the relative distance between numbers. The work of this unit helps students consolidate their understanding of the counting sequence, the base-ten structure of numbers, and the relative position of numbers on the number line. These understandings will be helpful as students add and subtract within 1,000 in future lessons.

Essential Questions:

1. Why is understanding place value important?
2. What are different ways to represent three-digit numbers?

Enduring Understanding:

- **We can read, write, compare, and manipulate numbers using place value understanding.** Our number system is based on groups of ten. Whenever there are 10 in one place, we move to the next greater place value. In a three-digit number, the hundreds digit tells how many groups of one hundred, the tens digit tells how many groups of ten and the ones digit tells how many groups of one.
- **There are different ways in which we can represent multi-digit numbers.** We can use base-ten blocks and diagrams to represent numbers in multiple ways. Whether we use the standard form of a number, base-ten blocks, or diagrams, these methods all connect back to our place value understanding.

<p>What Students Will Know:</p> <ul style="list-style-type: none"> ● A hundred is composed of 10 tens or 100 ones. ● A hundred is a unit. ● The connections between base-ten blocks and the value of each digit in a three-digit number. ● The three digits in a three-digit number represent amounts of hundreds, tens, and ones. ● How to read a three-digit number. ● The structure of a number line connects to a representation of 10 ones, 10 tens, or 10 hundreds. ● The two tens a two-digit and three-digit number falls between ● When comparing numbers we can compare hundreds to hundreds, tens to tens, and ones to ones and know that any number with a greater number of hundreds is larger than a number with fewer hundreds, regardless of the value of the tens and ones. 	<p>What students will do:</p> <ul style="list-style-type: none"> ● Represent hundreds in different ways. ● Recognize and describe the patterns 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). ● Read, write, and represent multiples of 100. ● Compose three-digit numbers using base-ten blocks and diagrams in multiple ways showing place value understanding. ● Identify and write 3-digit numbers using place value understanding ● Represent three-digit numbers as the sum of the value of each digit or expanded form (for example, $357=300+50+7$) ● Explain how the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. ● Explain how the number 0 holds value in three-digit numbers. ● Explain that numbers can be represented in different ways (e.g., 200 can be 20 tens and 0 ones). ● Recognize that numbers in a different order change the value of the number (e.g., 241 to 142; 186 to 168) ● Represent a three-digit number in different ways (e.g. 430 is 4 hundreds, 3 tens and 0 ones as well as 43 tens). 	<p>Unit Specific Vocabulary:</p> <p>Academic vocabulary</p> <p>Hundred Fewer Multiple Digit Expanded form Unit form Number name Expression <, >, = Compare Number line “point” Order Least Greatest</p>

	<ul style="list-style-type: none"> ● Represent numbers using unit form, base-ten numerals, expanded form, and words. ● Compare three-digit numbers using a number line ● Compare three-digit numbers using the value of each digit and place value understanding. ● Order numbers from least to greatest and greatest to least. ● Locate and label three-digit numbers on number lines. 	
<p>Entry Level Assessment and Connection to Unit:</p> <p>Section A Pre-Unit Practice Problems Section B Pre-Unit Practice Problems</p>	<p>Unit Materials, Resources and Technology:</p> <ul style="list-style-type: none"> ● Illustrative Mathematics ● Instructional Routines and Math Language Routines ● Glossary - Student-friendly ● Required Materials ● IM en Español ● Pacing Guide and Dependency Diagrams K-5 ● 	
<p>Opportunities for Interdisciplinary Connections:</p> <p>Science requires precision in the collection of data and numbers. Students will use place value understanding when collecting data and analyzing data.</p>		
<p>Any links, attachments and resources:</p> <p>Instructional Routines Document Family Support Materials</p>	<p>Planning Ideas:</p> <p>Components of a Typical IM Lesson What To Know About IM When Planning Where to Find the Mathematical Practices in the Units Assessing the Mathematical Practices</p>	

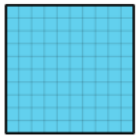
Topic # 1 (Section A)**Topic Name: Section A - The Value of Three Digits****Duration:**

Recommended: 7 days (7 lessons)

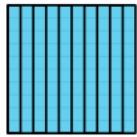
Topic Description:

This section introduces the unit of a hundred. Students begin by analyzing the large square base-ten block, and its corresponding base-ten diagram, to recognize 100 as 1 hundred, 10 tens, or 100 ones.

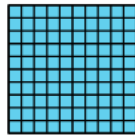
1 hundred



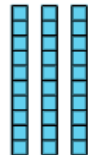
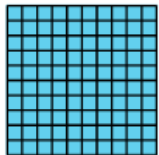
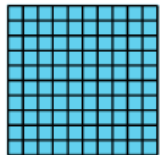
10 tens



100 ones



Students learn that the digits in three-digit numbers represent amounts of hundreds, tens, and ones. They use this insight to write numbers and represent quantities in different forms—base-ten numerals, words, and expanded form. Students see that they can compose a hundred with 10 tens, just as they can compose a ten with 10 ones, and that a quantity can be expressed in many ways.



2 hundreds 3 tens 8 ones

two hundred thirty-eight

 $200 + 30 + 8$

238

Composing larger units from smaller units allows students to express a quantity using the fewest number of each unit, which reinforces the meaning of the digits in a three-digit number and prepares students to add and subtract such numbers later. It also lays the foundation for generalizing the relationship between the digits of other numbers in the base-ten system in future grades.

Section Learning Goals

- Read, write, and represent three-digit numbers using base-ten numerals and expanded form.
- Use place value understanding to compose and decompose three-digit numbers.

<p>Competencies Addressed:</p> <p>Understanding and Applying Number Systems 2.NS.1 I understand place value of three-digit numbers. (2.NBT.A.1) 2.NS.2 I can count, read, and write whole numbers. (2.NBT.A.2-3) 2.NS.4 I can use my understanding of place value and properties of operations to add. (2.NBT.B.5-9) 2.NS.5 I can use my understanding of place value to subtract. (2.NBT.B.5, 7-9)</p> <p>Operations and Algebraic Thinking 2.OA.1 I can add within 20. (2.OA.B.2) 2.OA.2 I can subtract within 20. (2.OA.B.2)</p>	<p>Essential Question and Enduring Understanding Addressed in this Topic:</p> <p>Essential Question 1. Why is understanding place value important?</p> <p>Enduring Understanding</p> <ul style="list-style-type: none"> ● We can read, write, compare, and manipulate numbers using place value understanding. Our number system is based on groups of ten. Whenever there are 10 in one place, we move to the next greater place value. In a three-digit number, the hundreds digit tells how many groups of one hundred, the tens digit tells how many groups of ten and the ones digit tells how many groups of one.
<p>In this Topic, students will know:</p> <ul style="list-style-type: none"> ● A hundred is composed of 10 tens or 100 ones. ● A hundred is a unit. ● The connections between base-ten blocks and the value of each digit in a three-digit number. ● The three digits in a three-digit number represent amounts of hundreds, tens, and ones. ● How to read a three-digit number. 	<p>Topic Vocabulary:</p> <p>Academic vocabulary Hundred Fewer Multiple Digit Expanded form Unit form Number name Expression</p>

In this Topic, students will be able to:

- Recognize and describe the patterns 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).
- Read, write, and represent multiples of 100.
- Compose three-digit numbers using base-ten blocks and diagrams in multiple ways showing place value understanding.
- Identify and write 3-digit numbers using place value understanding
- Represent three-digit numbers as the sum of the value of each digit or expanded form (for example, $357=300+50+7$)
- Represent numbers using unit form, base-ten numerals, expanded form, and words.
- Explain how the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
- Explain how the number 0 holds value in three-digit numbers.
- Explain that numbers can be represented in different ways (e.g., 200 can be 20 tens and 0 ones).
- I can recognize that numbers in a different order change the value of the number (e.g., 241 to 142; 186 to 168)
- I can represent a three-digit number in different ways (e.g. 430 is 4 hundreds, 3 tens and 0 ones as well as 43 tens).

Plan for Student Reflection:

[Student Journal Prompts and Reflection Practices](#)

Plan for Teacher Reflection:

Lesson 1: What unfinished learning or misunderstandings do your students have about composing tens and place value? How did you leverage those misconceptions in a positive way to further the understanding of the class?

Lesson 2: As students worked in their small groups today, whose ideas were heard, valued, and accepted? How can you adjust the group structure tomorrow to ensure each student's ideas are a part of the collective learning?

Lesson 3: 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 4: Why is it important for students to be able to connect different representations of three-digit numbers? How does the work of today's lesson help students expand their understanding of place value to include a hundred as a unit?

Lesson 5: As students represented numbers in expanded form and as three-digit numbers, what evidence did you see that they understand place value?

Lesson 6: Reflect on how comfortable your students are asking questions of you and of each other. What can you do to encourage students to ask questions?

Lesson 7: Who got to do math today in class and how do you know? Identify the norms or routines that allowed those students to engage in mathematics. How can you adjust these norms and routines so all students do math tomorrow?

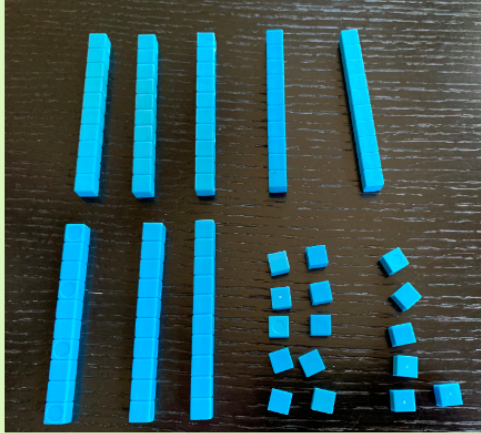
Utilize additional strategies for Teacher Reflection:

- Reviewing formative assessments
- Developing scaffolds
- Collaborative scoring
- PLCs
- Planning for small groups

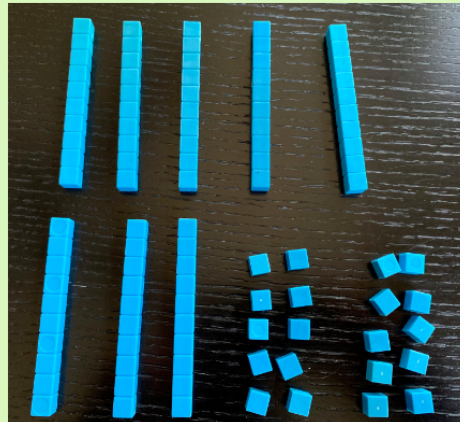
Topic 1 Task Development

Task Title: Topic 1 - The Value of Three Digits	Grade Level and Unit: Grade 2, Unit 5
<p>Description of Task: Students will create a visual display to show their place value understanding in multiple ways. They will be given a three-digit number to represent. Students will represent the number on their poster using:</p> <ul style="list-style-type: none">- a three-digit number- a base-ten diagram- expanded form- words- only tens and ones- An additional way to compose the number <p>Students reflect on which representation has been most helpful in developing an understanding of the hundreds, tens, and ones in three-digit numbers.</p>	<p>Purpose of Task: The purpose of this task is for students to represent numbers using unit form, base-ten numerals, expanded form, and words. They gain more experience with numbers represented in all the different ways they have worked with so far. When students relate the different ways to represent a three-digit number (words, expanded form, diagrams, numerals) they deepen their understanding of the structure of the base-ten system.</p>
<p>Background of Students/Learning Progression: In previous lessons, students learned different ways that can be used to represent numbers (digits, base-ten, expanded form, words, and composing the number in multiple ways). In this task, students will put it all together to show their understanding. Students will later use this understanding to compare numbers and to add and subtract. Later, they will extend their place value understanding to the thousands place.</p>	<p>Ensure all competencies are addressed in the task:</p> <ul style="list-style-type: none"><input type="checkbox"/> Yes, all competencies are addressed<input type="checkbox"/> No - Task needs modification
<p>Getting Started:</p> <p>To get students started, utilize the warm-up of Lesson 1:</p> <p>Lesson 1 (Warm Up) The purpose of this activity is to introduce students to a new unit, the hundred. Students used connecting cubes to make tens in grade 1 and used tens and ones to count to and represent numbers within 120.</p>	

1. How many do you see? How do you see them?



2. Andre added more blocks.



What is the value of Andre's blocks now?

How many tens and ones are in this number?

Andre made the same number with the fewest amount of blocks possible. Draw a base-ten diagram to show what Andre's number looks like now. Use your base-ten blocks to help.

Section A

IM Lesson	Lesson 1: How Do We Compose a Hundred?	Lesson 2: Make Hundreds	Lesson 3: Compose Three-digit Numbers	Lesson 4: Write Three-digit Numbers	Lesson 5: Expanded Form of Numbers	Lesson 6: Represent Numbers in Different Ways	Lesson 7: Center Day 1 (optional)
Learning Cycle Model	Making Meaning	Making Meaning	Investigation	Investigation	Investigation	Create/Produce	Additional Learning
Naugatuck Math Competency	2.NS.1 2.NS.2	2.NS.1 2.NS.2	2.NS.1 2.NS.2 2.NS.4	2.NS.1 2.NS.2	2.NS.1 2.NS.2	2.NS.2	2.NS.1 2.NS.4, 2.NS.5 2.OA.1, 2.OA.2
Math Practice Standards	MP7, MP8	MP8	MP7	MP3, MP6	MP7	MP6, MP7	
Lesson Purpose	The purpose of this lesson is for students to make sense of a hundred as a unit composed of 10 tens or 100 ones.	The purpose of this lesson is for students to represent hundreds in different ways.	The purpose of this lesson is for students to use base-ten representations to build an understanding of the digits in three-digit numbers.	The purpose of this lesson is for students to use their understanding of place value to identify and write three-digit numbers.	The purpose of this lesson is for students to use expanded form and base-ten numerals to represent numbers within 1,000.	The purpose of this lesson is for students to represent numbers using unit form, base-ten numerals, expanded form, and words.	The purpose of this lesson is for students to work with place value and practice addition and subtraction within 100.
Vocabulary Focus	“Hundred”, fewer	Multiple		Digit	Expanded form	Unit form, number name	Expressions

Lesson Materials/ Resources	Lesson 1 Slides	Lesson 2 Slides	Lesson 3 Slides	Lesson 4 Slides	Lesson 5 Slides	Lesson 6 Slides	Lesson 7 Slides
	Teacher Presentation Materials	Teacher Presentation Materials	Teacher Presentation Materials	Teacher Presentation Materials	Teacher Presentation Materials	Teacher Presentation Materials	Teacher Presentation Materials
	Student Pages	Student Pages	Student Pages	Student Pages	Student Pages	Student Pages	Student Pages
	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks. <p>Activity 2:</p> <ul style="list-style-type: none"> ● Gives students access to base-ten blocks including at least 1 block that represents 100. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Give each group at least 50 base-ten blocks. <p>Activity 2:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks, including hundred blocks. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Each group of 3–4 students will need a container with 2 hundreds, 28 tens, and 15 ones. ● Each group of 3–4 students will need access to additional base-ten blocks (hundred blocks and ten blocks). <p>Activity 2:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks. <p>Activity 2:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Give students access to base-ten blocks. <p>Activity 2:</p> <ul style="list-style-type: none"> ● Each group of 2 needs 3 number cubes. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Prepare an anchor chart (see teacher guide) <p>Activity 2:</p> <ul style="list-style-type: none"> ● Prepare an anchor chart (see teacher guide) ● Give each group tools for making a display. 	<p>Activity 1:</p> <ul style="list-style-type: none"> ● Give each group a set of Number cards 0–10 and Mystery Number Stage 2 Directions. <p>Activity 2:</p> <ul style="list-style-type: none"> ● Centers - see below
	Cool-down: Fewer Blocks	Cool-down: How Many?	Cool-down: How Many Blocks?	Cool-down: Order of Digits	Cool-down: Three-digit Numbers in	Cool-down: Words and Other Ways	

					Expanded Form		
Assessment	Formative Assessment Strategies: observation, questioning, student discourse : Monitoring Sheet See Section A Checkpoint Assessment , Section A Checkpoint Teacher's Guide						
							Section A Practice Problems
Centers Materials	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Greatest of Them All (1–5) , Stage 1: Two-digit Numbers (Supporting)	Jump the Line , Stage 1 Mystery Number (1–4) , Stage 2
	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Mystery Number (1–4) , Stage 1: Two-digit Numbers (Supporting)	Number Puzzles , Stages 2–4

Making Meaning:

In grade 1, students were introduced to a ten as a unit made of 10 ones. They used that understanding to represent two-digit numbers and add within 100. Students used connecting cubes to make and break apart two-digit numbers. In previous units in grade 2, students used the words compose and decompose as they made and broke apart tens when they added and subtracted within 100. In Lesson 1, students are introduced to the unit of a hundred. Building on the understanding that they can use 10 ones to compose a ten, students learn they can compose a hundred using 10 tens.

In Lesson 2, students deepen their understanding of a hundred as a unit. They learn that for every 10 tens, they can compose 1 hundred. Students notice that it may be easier to count the hundreds rather than count the tens to find a total value. Students begin to recognize and describe the patterns in the structure of the base-ten system (MP7, MP8). 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 identify the multiples of 100 written as numerals and begin to make connections between base-ten blocks and the value of each digit in a three-digit number.

Lesson 1: [How Do We Compose a Hundred?](#)

- The purpose of this lesson is for students to make sense of a hundred as a unit composed of 10 tens or 100 ones.
- [Lesson 1 Slides](#)
- [Teacher Presentation Materials](#)

Lesson 2: [Make Hundreds](#)

- The purpose of this lesson is for students to represent hundreds in different ways.
- [Lesson 2 Slides](#)
- [Teacher Presentation Materials](#)

Investigation:

In Lesson 3, students represent three-digit numbers that include an amount of hundreds, tens, and ones. In the first activity, students take inventory of the units represented by a collection of base-ten blocks. They use their understanding of the units of hundred and ten to determine how to represent the total value with the fewest number of blocks possible. In the second activity, students use base-ten diagrams to represent values using the fewest number of each unit possible and connect these representations to the meaning of each digit in a three-digit numeral. In both activities, look for the different ways students represent and record the value of their blocks for reference in the activity syntheses and in future lessons.

In Lesson 4, students build on this understanding to write three-digit numbers when the number or value of the hundreds, tens, and ones are shown in different orders. Throughout the lesson, students practice identifying and writing three-digit numbers using their understanding of place value.

In Lesson 5, students extend their understanding of ways to express the value of the digits in three-digit numbers to include expanded form. They represent three-digit numbers as the sum of the value of each digit (for example, $357=300+50+7$).

Lesson 3: [Compose Three-digit Numbers](#)

- The purpose of this lesson is for students to use base-ten representations to build an understanding of the digits in three-digit numbers.
- [Lesson 3 Slides](#)
- [Teacher Presentation Materials](#)

Lesson 4: [Write Three-digit Numbers](#)

- The purpose of this lesson is for students to use their understanding of place value to identify and write three-digit numbers.
- [Lesson 4 Slides](#)

- [Teacher Presentation Materials](#)

Lesson 5: [Expanded Form of Numbers](#)

- The purpose of this lesson is for students to use expanded form and base-ten numerals to represent numbers within 1,000.
- [Lesson 5 Slides](#)
- [Teacher Presentation Material](#)

Create and Produce:

Lesson 6 Activity 2

The purpose of this activity is for students to represent numbers in all the ways they have seen so far in this unit. Students are given a number in one form and they represent the same number in different ways. In the synthesis, students share which representations are most helpful. When students relate the different ways to represent a three-digit number (words, expanded form, diagrams, numerals) they deepen their understanding of the structure of the base-ten system (MP7).

In Lesson 6, students are introduced to one more way to represent numbers, that is, using words. They gain more experience with numbers represented in all the different ways they have worked with so far. In the lesson synthesis, students reflect on which representation has been most helpful in developing an understanding of the hundreds, tens, and ones in three-digit numbers.

“Each group will be given a number. Work with your group to represent that number in different ways.”

“Think about how you might organize your representations and make sure that each group member does their fair share.”

“Your group should represent the number as a three-digit number, with a base-ten diagram, using expanded form, and using words.”

Represent the number on your poster. Be sure to represent the number using:

a three-digit number

a base-ten diagram

expanded form

words

If you have time: Represent the number using only tens and ones. Represent the number composed in a different way.

Lesson 6: [Represent Numbers in Different Ways](#)

- The purpose of this lesson is for students to represent numbers using unit form, base-ten numerals, expanded form, and words.
- [Lesson 6 Slides](#)
- [Teacher Presentation Materials](#)

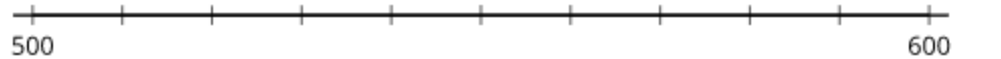
<p>Communicate and Present: Lesson 6 Activity 2</p> <p>“How do your representations show _____ (number given to group)?” “What is the same and different about all the different representations?”</p> <p>“Now you will walk around and see other numbers and how they were represented in different ways.” “Think about which representations most clearly show you the value of the number.” “Then, check that all of the representations show the same number.”</p>	<p>Reflection: “Today you had the chance to represent numbers in different ways and make connections across representations.”</p> <p>“While you walked around, what representation did you look for first to help you identify the number? Why?” (I looked at the base-ten numeral first and compared it to the expanded form. Then I checked the others.)</p> <p>“What questions do you have about three-digit numbers or any of the representations you saw today?”</p>
<p>Additional Learning: In Lesson 7, Activity 1, students learn stage 2 of the Mystery Number center, which was first introduced in grade 1. In this new stage, called Three-digit Numbers, they use clues based on place value to identify the number being described. In Activity 2, students choose to continue working on Mystery Number, or choose between two previously introduced centers focused on addition and subtraction.</p> <p>Lesson 7: Center Day 1 (optional)</p> <ul style="list-style-type: none"> • The purpose of this lesson is for students to work with place value and practice addition and subtraction within 100. • Lesson 7 Slides • Teacher Presentation Materials 	
<p>Notes: Follow IM lessons in order</p>	<p>Complete File with Resources and Task:</p>

Topic # 2 (Section B)	Topic Name: Section B - Compare and Order Numbers within 1,000	Duration: Recommended 8 days (7 lessons) 1 extra day for Unit Assessment
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Topic Description:

In this section, students use number line diagrams to deepen their understanding of numbers to 1,000. They begin by skip-counting on the number line to build a sense of the relative position of numbers to 1,000. They recall the structure of the number line from a previous unit and use it, along with their understanding of place value, to locate, compare, and order numbers on the number line.

This number line, for example, is divided into intervals of 10 units, representing 10 tens from 500 to 600. In a task, students may be asked to locate the number 540 and estimate the location of the number 546.

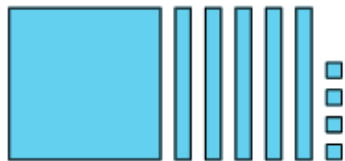


As students locate or estimate the location of three-digit numbers on number lines such as these, they show an understanding of a number's relative distance from zero and the place value of the digits. This understanding helps them to compare and order three-digit numbers. Students see that the numbers get larger as they move from left to right on the line.

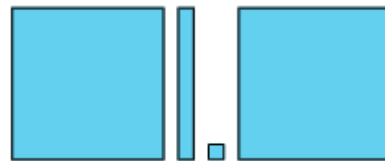
To compare and order three-digit numbers written as base-ten numerals, students also continue to use base-ten blocks, base-ten diagrams, or other representations that make sense to them. They write the comparisons using the symbols, $>$, $<$, and $=$.

Who has more? How do you know?

Mai



Tyler



Section Learning Goals:

- Compare and order three-digit numbers using place value understanding and the relative position of numbers on a number line.
- Represent whole numbers up to 1,000 as lengths from 0 on a number line.

Competencies Addressed:

Understanding and Applying Number Systems

- 2.NS.1** I understand place value of three-digit numbers. (2.NBT.A.1)
- 2.NS.2** I can count, read, and write whole numbers. (2.NBT.A.2-3)
- 2.NS.3** I can apply my understanding of place value to compare whole numbers. (2.NBT.A.4)
- 2.NS.4** I can use my understanding of place value and properties of operations to add. (2.NBT.B.5-9)
- 2.NS.5** I can use my understanding of place value to subtract. (2.NBT.B.5, 7-9)

Operations and Algebraic Thinking

- 2.OA.3** I can represent and solve problems involving addition and subtraction. (2.OA.A.1, 2.MD.B.5-6)

Essential Question and Enduring Understanding Addressed in this Topic:

Essential Question

1. How can we show our place value understanding and why is it useful?
2. What are different ways to represent three-digit numbers?

Enduring Understanding

- **We can read, write, compare, and manipulate numbers using place value understanding.** Our number system is based on groups of ten. Whenever there are 10 in one place, we move to the next greater place value. In a three-digit number, the hundreds digit tells how many groups of one hundred, the tens digit tells how many groups of ten and the ones digit tells how many groups of one.
- **There are different ways in which we can represent multi-digit numbers.** We can use base-ten blocks and diagrams to represent numbers in multiple ways. Whether we use the standard form of a number, base-ten blocks, or diagrams, these methods all connect back to our place value understanding.

<p>In this Topic, students will know:</p> <ul style="list-style-type: none"> • The structure of a number line connects to a representation of 10 ones, 10 tens, or 10 hundreds. • The two tens a two-digit and three-digit number falls between • When comparing numbers we can compare hundreds to hundreds, tens to tens, and ones to ones and know that any number with a greater number of hundreds is larger than a number with fewer hundreds, regardless of the value of the tens and ones. 	<p>Topic Vocabulary:</p> <p>Academic vocabulary</p> <p><, >, =</p> <p>Compare</p> <p>Number line “point”</p> <p>Order</p> <p>Least</p> <p>Greatest</p>
<p>In this Topic, students will be able to:</p> <ul style="list-style-type: none"> • Compare three-digit numbers using a number line • Compare three-digit numbers using the value of each digit and place value understanding. • Order numbers from least to greatest and greatest to least. • Locate and label three-digit numbers on number lines. 	<p>Plan for Student Reflection:</p> <p>Student Journal Prompts and Reflection Practices</p> <hr/> <p>Plan for Teacher Reflection:</p> <p>Lesson 8: In an earlier unit, students learned to locate and represent numbers as lengths from 0 on the number line. How did students draw on their earlier experiences with number lines, counting, and place value to reason about how to locate and label three-digit numbers on the number line? What ideas or connections might need to be made more explicit to help all students deepen their understanding of three-digit numbers?</p> <p>Lesson 9: Unlike talking, listening is a difficult thing to observe. At what points in the lesson did you observe students listening to one another’s ideas today in class? What indicators do you have that they were listening?</p> <p>Lesson 10: Identify who has been sharing their ideas in class lately. Make a note of students whose ideas</p>

have not been shared and look for an opportunity for them to share their thinking in tomorrow's lesson.

Lesson 11: Students shared their thinking multiple times in this lesson. How did students reason about or explain their comparisons? What have you noticed about the language students use that show they understand how to compare three-digit numbers based on the meaning of their digits?

Lesson 12: In future lessons, students will add and subtract within 1,000. How does the work of this unit prepare them for that work? How can centers be used to strengthen students' understanding of place value?

Lesson 13: What opportunities are you giving students to reflect on their understanding of the mathematical content?

Lesson 14: How do students transfer their understanding of base-ten representations to real-world situations? How can you support students with making these connections outside of math class?

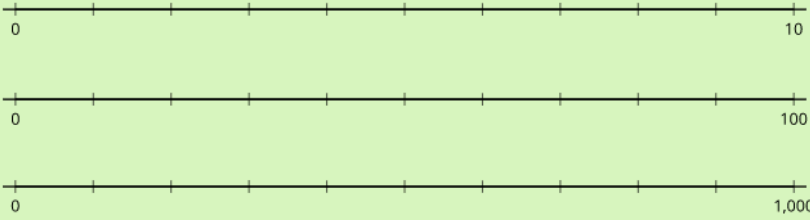
Utilize additional strategies for Teacher Reflection:

- Reviewing formative assessments
- Developing scaffolds
- Collaborative scoring
- PLCs
- Planning for small groups

Topic 2 Task Development

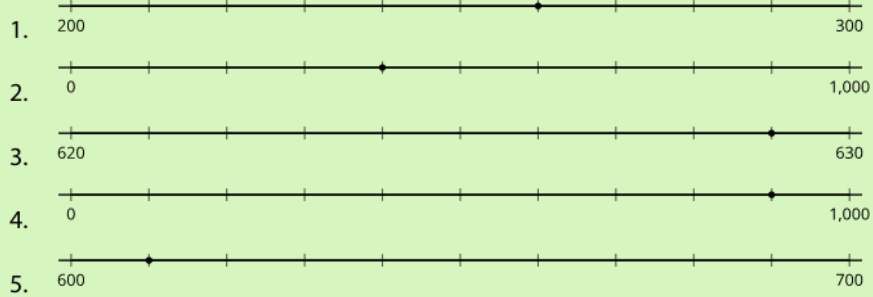
<p>Task Title: Topic 2 - Compare and Order Numbers within 1,000</p>	<p>Grade Level and Unit: Grade 2, Unit 5</p>
<p>Description of Task: “Hundreds of Objects”</p> <p>In this task students will organize and count a collection of objects using place value understanding. They will display their organized collection and participate in a gallery walk. Students will need between one-half cup to one cup of beans or other small objects to count. If real-world objects are unavailable, centimeter cubes could be used instead.</p> <p>Gallery walk questions:</p> <p>How does this strategy help you count their beans? How can this be made clearer? How is this strategy the same as your strategy? How is it different? Does your group have more or fewer beans? Explain your reasoning</p>	<p>Purpose of Task:</p> <p>The purpose of this lesson is for students to apply their understanding of place value to count real-world objects. When students investigate the advantages and disadvantages of different methods of counting a large number of objects and then choose a method to use they critique the reasoning of others and model with mathematics</p>
<p>Background of Students/Learning Progression:</p> <p>In this task, students build on their previous understandings and experiences with representations of numbers between 100 and 999. Students use their understanding of the base-ten structure of numbers to count and represent quantities of real-world objects.</p>	<p>Ensure all competencies are addressed in the task:</p> <p><input type="checkbox"/> Yes, all competencies are addressed <input type="checkbox"/> No - Task needs modification</p>
<p>Getting Started: In the lessons that make up Topic 2 - Section B of Unit 5, students will:</p> <ul style="list-style-type: none"> • Compare and order three-digit numbers using place value understanding and the relative position of numbers on a number line. • Represent whole numbers up to 1,000 as lengths from 0 on a number line. <p>Lesson 8 (Warm Up)</p> <p>The purpose of this activity is for students to connect their understanding of the counting sequence within 1,000 and their understanding of place value to the structure of the number line. In the launch, students make sense of 3 number lines that have different unit intervals. They may reason about the numbers each tick mark represents by counting by 1, 10, or 100. Other students may notice that there are 10 lengths (unit intervals) and relate this to decomposing a ten or hundred to describe the numbers represented by each tick mark. Throughout the activity, encourage students to make connections between the reasoning they use based on counting and their understanding of place value as they write three-digit numbers and make sense of the structure of the number line (MP7).</p>	

What do you notice? What do you wonder?



Locate and label 30, 300, and 3 on a number line.

Label each point with a number it represents.



“How did you decide how to label the point?”

“What numbers do the tick marks on this number line represent?”

“Looking at the starting and ending numbers, what skip-counting pattern could you use to count the tick marks?”

Section B

IM Lesson	Lesson 8: Three-digit Numbers on the Number Line	Lesson 9: Compare Numbers on the Number Line	Lesson 10: Place Value Comparisons (Part 1)	Lesson 11: Place Value Comparisons (Part 2)	Lesson 12: Order Numbers	Lesson 13: Center Day 2 (optional)	Lesson 14: Hundreds of Objects (optional)
Learning Cycle Model	Making Meaning	Making Meaning	Investigation	Investigation	Create/Produce	Additional Learning	Additional Learning
Naugatuck Math Competency	2.OA.3 2.NS.1 2.NS.2	2.OA.3 2.NS.1 2.NBT.A.4	2.NS.3 2.NS.4	2.NS.1 2.NS.2 2.NS.3	2.NS.1 2.NS.3 2.NS.5	2.NS.1 2.NS.3	2.NS.1 2.NS.2
Math Practice Standards	MP7, MP8	MP2, MP3	MP7, MP8		MP3, MP5	MP7	MP, MP7
Lesson Purpose	The purpose of this lesson is for students to locate and label three-digit numbers on number lines.	The purpose of this lesson is for students to compare three-digit numbers using a number line.	The purpose of this lesson is for students to compare three-digit numbers using their understanding of place value.	The purpose of this lesson is for students to compare three-digit numbers using their understanding of place value.	The purpose of this lesson is for students to order numbers from least to greatest and greatest to least.	The purpose of this lesson is for students to order, compare, and describe three-digit numbers using their understanding of place value.	The purpose of this lesson is for students to apply their understanding of place value to count real-world objects.
Vocabulary Focus	Number line “point”	Compare			Order, least, greatest		

<p>Lesson Materials/ Resources</p>	<p>Lesson 8 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>No materials to copy for activities</p> <p>Cool-down: Large Numbers on the Number Line</p>	<p>Lesson 9 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>No materials to copy for activities</p> <p>Cool-down: Compare Numbers on the Number Line</p>	<p>Lesson 10 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>No materials to copy for activities</p> <p>Cool-down: Count and Compare</p>	<p>Lesson 11 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>Activity 2:</p> <ul style="list-style-type: none"> Give each group a set of Number cards 0–10 and a copy of Greatest of Them All Stage 2 Recording Sheet <p>Cool-down: Place Value Comparisons</p>	<p>Lesson 12 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>No materials to copy for activities</p> <p>Cool-down: Estimate and Order</p>	<p>Lesson 13 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>Activity 1:</p> <ul style="list-style-type: none"> Give each group a set of Number cards 0–10, a Get Your Numbers in Order Stage 2 Gameboard, and a dry erase marker <p>Activity 2:</p> <ul style="list-style-type: none"> Centers - see below 	<p>Lesson 14 Slides</p> <p>Teacher Presentation Materials</p> <p>Student Pages</p> <p>Activity 2:</p> <ul style="list-style-type: none"> Each group of 2 to 4 students will need between one-half cup to one cup of beans or other small objects to count. Give each group 1 cup of beans and a sticky note.
<p>Assessment</p>	<p>Formative Assessment Strategies: observation, questioning, student discourse : Monitoring Sheet See Section B Checkpoint Assessment, Section B Checkpoint Teacher’s Guide End of Unit 5 Assessment, End of Unit 5 Assessment Teacher’s Guide</p>						
							<p>Section B Practice Problems</p>
<p>Centers Materials</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>	<p>Get Your Numbers in Order (1–5), Stage 1: Two-digit</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>	<p>Mystery Number (1–4), Stage 2: Three-digit</p>

	<p>Numbers (Addressing)</p> <p>Greatest of Them All (1–5), Stage 2: Three-digit Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 1: Two-digit Numbers (Supporting)</p>	<p>Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 1: Two-digit Numbers (Supporting)</p> <p>Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Supporting)</p>	<p>Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 1: Two-digit Numbers (Supporting)</p> <p>Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Supporting)</p>	<p>Numbers (Supporting)</p> <p>Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Supporting)</p>	<p>Numbers (Addressing)</p> <p>Greatest of Them All (1–5), Stage 2: Three-digit Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 1: Two-digit Numbers (Supporting)</p> <p>Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Supporting)</p>	<p>Numbers (Addressing)</p> <p>Greatest of Them All (1–5), Stage 2: Three-digit Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 2: Three-digit Numbers (Addressing)</p>	<p>Numbers (Addressing)</p> <p>Greatest of Them All (1–5), Stage 2: Three-digit Numbers (Addressing)</p> <p>Get Your Numbers in Order (1–5), Stage 2: Three-digit Numbers (Addressing)</p>
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Making Meaning

In Lesson 8, students revisit the structure of the number line and use what they know about place value and counting by 10 and 100 to locate three-digit numbers on a number line (MP7). Throughout the lesson, students work with number lines that show 10 length units. The only labeled tick marks are the starting and ending numbers. Students locate and label numbers on these number lines by reasoning about the size of each length unit using what they know about counting within 1,000 and place value. They are encouraged to connect the structure of the number line to a representation of 10 ones, 10 tens, or 10 hundreds. This understanding will be important when students compare three-digit numbers in upcoming lessons.

In Lesson 9, students use the relative position of numbers on the number line to compare three-digit numbers. Students estimate the location of numbers on the number line and consider how the linear representation can help them compare numbers and explain their reasoning (MP3). Throughout the lesson, listen for the ways students make connections to place value as they estimate the location of numbers and compare numbers using the number line.

Lesson 8: [Three-digit Numbers on the Number Line](#)

- The purpose of this lesson is for students to locate and label three-digit numbers on number lines.
- [Lesson 8 Slides](#)
- [Teacher Presentation Materials](#)

Lesson 9 : [Compare Numbers on the Number Line](#)

- The purpose of this lesson is for students to compare three-digit numbers using a number line.
- [Lesson 9 Slides](#)
- [Teacher Presentation Materials](#)

Investigation:

In Lesson 10, students transition from representing and comparing three-digit numbers based on the counting sequence and their location on the number line to focus on reasoning based on place value. They compare hundreds to hundreds, tens to tens, and ones to ones and learn that any number with a greater number of hundreds is larger than a number with fewer hundreds, regardless of the value of the tens and ones (MP7). For example, $202 > 199$ because there are 2 hundreds compared to 1 hundred. In this lesson, they compare quantities represented with base-ten diagrams to support students' reasoning based on place value.

In Lesson 11, students compare three-digit numbers in tasks that do not suggest a particular representation. In the first activity, students complete comparison statements to make them true and are encouraged to explain or show their thinking in a way that makes sense to them. In the second activity, students learn a new stage of the Greatest of Them All center. This activity encourages students to reason about place value as they use digits to make three-digit numbers and compare numbers with their partner.

Lesson 10: [Place Value Comparisons \(Part 1\)](#)

- The purpose of this lesson is for students to compare three-digit numbers using their understanding of place value.
- [Lesson 10 Slides](#)
- [Teacher Presentation Materials](#)

Lesson 11: [Value Comparisons \(Part 2\)](#)

- The purpose of this lesson is for students to compare three-digit numbers using their understanding of place value.
- [Lesson 11 Slides](#)
- [Teacher Presentation Materials](#)
-

Create and Produce:

In Lesson 12, students compare three-digit numbers and place them in order from least to greatest and from greatest to least. Throughout the lesson, students are encouraged to use their understanding of place value to reason about the correct order of a set of numbers. They also use the number line as a tool for sequencing numbers and visualizing the relative distance between numbers. The work of this lesson helps students consolidate their understanding of the counting sequence, the base-ten structure of numbers, and the relative position of numbers on the number line. These understandings will be helpful as students add and subtract within 1,000 in future lessons. The purpose of Activity 2 is for students to order numbers. Students estimate the location and label numbers on a number line, and then write them in order from least to greatest or greatest to least. For the third set of numbers, students may order the numbers using any method that makes sense to them. Students reflect on how the number line can help us organize numbers (MP5). Throughout the activity, monitor the way students explain their reasoning based on place value and the relative position of numbers on the number line.

Lesson 12: [Order Numbers](#)

- The purpose of this lesson is for students to order numbers from least to greatest and greatest to least.
- [Lesson 12 Slides](#)
- [Teacher Presentation Materials](#)
-

Communicate and Present:**Lesson 12, Activity 2:**

“Now you will have a chance to order numbers.”

“Sometimes you will put them in order from least to greatest, and sometimes it will be from greatest to least.”

“Compare with a partner. Explain your thinking.”

“How did you decide the order of your numbers?”

“Does your list show the numbers in order from least to greatest or greatest to least?”

Invite students to share their reasoning.

“How did you decide the order of your numbers?”

“Does your list show the numbers in order from least to greatest or greatest to least?”

Lesson 14, Activity 2:**Reflection:****Lesson 12, Activity 2:**

“How are the numbers you labeled on the number line the same as the list of numbers you wrote? How are they different?” (For least to greatest, it's the same. The difference is the number line shows the distance between each number, but the list of numbers shows them right next to each other.)

“During this unit we have used different representations to help us think about large numbers. Think about all the work we did with numbers up to 1,000.

“Which representations help you make sense of large numbers and compare them to one another? Using a base-ten diagram, looking at the digits, or using a number line?”

“I noticed some students prefer one representation for place value, but a different one when comparing or ordering numbers. It is good to know what works best for you and when to use it.”

“You will use any method you prefer to count the beans and then write your result on one sticky note and then fold it to hide your result.”

Organize and count your beans. Use the space to record your thinking.

Gallery walk questions:

How does this strategy help you count the beans?

How can this be made clearer?

How is this strategy the same as your strategy? How is it different?

Does your group have more or fewer beans? Explain your reasoning.

Lesson 14, Activity 2:

“When you organized your beans and counted them, did you feel confident about your results? Why?”

“Today, we used strategies we have been studying about numbers between 100 and 999 to count a large amount of beans.”

“What are important things to remember when you count a large number of objects? What is important when you represent your strategy so that it is clear to others?”

Additional Learning:

In Lesson 13, Activity 1, students learn a new stage of the Get Your Numbers in Order center, which was first introduced in grade 1. In this stage, students use their understanding of relative magnitude to order three-digit numbers. In Activity 2, students choose 2 activities to work on that provide practice with place value, addition, and subtraction.

Lesson 13: [Center Day 2 \(optional\)](#)

- The purpose of this lesson is for students to order, compare, and describe three-digit numbers using their understanding of place value.
- [Lesson 13 Slides](#)
- [Teacher Presentation Materials](#)

In Lesson 14, students build on their previous understandings and experiences with representations of numbers between 100 and 999. Students use their understanding of the base-ten structure of numbers to count and represent quantities of real-world objects (MP7). When students investigate the advantages and disadvantages of different methods of counting a large number of objects and then choose a method to use they critique the reasoning of others and model with mathematics (MP3, MP4). The purpose of Activity 2, is for students to choose their own method to count between 100 and 999 objects accurately and efficiently. Students should be encouraged to use their understanding of place value.

Lesson 14: [Hundreds of Objects \(optional\)](#)

- The purpose of this lesson is for students to apply their understanding of place value to count real-world objects.
- [Lesson 14 Slides](#)
- [Teacher Presentation Materials](#)

Notes: Follow IM lessons in their original order.

Complete File with Resources and Task: