Bristol Public Schools

Office of Teaching & Learning

Department	Mathematics
Department Philosophy	*Students learn by doing math, solving problems in mathematical and real-world contexts, and constructing arguments using precise language.* The Bristol mathematics curricula embeds this *learn-by-doing* philosophy by focusing on high expectations for all students and providing students with opportunities that build conceptual understanding, computational and procedural fluency, and problem solving through the use of a variety of strategies, tools, and technologies. The mathematics curriculum is responsive to the individual needs of students, while providing a structure tied to the Common Core State Standards in Connecticut. The *learn-by-doing* philosophy develops mathematically literate and productive students who can effectively and efficiently apply mathematics in their lives to make informed decisions about the world around them by doing math. To be mathematically literate, one must understand major mathematics concepts, possess computational facility, and have the ability to apply these understandings to situations in daily life. Making connections between mathematics and other disciplines is key to the appropriate application of mathematics skills and concepts to solve problems. The ability to read, discuss, and write within the discipline of mathematics is an integral skill that supports mathematical understanding, reasoning and communication. The opportunity to think critically and creatively to solve problems is important to deepen mathematical knowledge and foster innovation. A rich hands-on mathematical experience is essential to provide the foundational knowledge and skills that prepare students to be mathematically literate, productive citizens.
Course	Grade 2 Mathematics
Grade Level	Grade 2
Pre-requisites	Grade 1

Table of Contents

M-Major Cluster, S-Supporting Cluster, A-Additional Cluster

District Learning Expectations and Standards	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9 (optional)
Operations & Algebraic Thinking									
Represent and solve problems involving addition and subtraction.									
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	M	M	M	M		M			M
Add and subtract within 20.									
2.OA.B.2 Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.	M	M	M		M			M	M
Work with equal groups of objects to gain foundations for multiplication.									
2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.								S	
2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.								S	
Number & Operations in Base Ten									
Understand place value.									

2.NBT.A.1 Understand that 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. Understand the following as special cases:					M	M	M		M
2.NBT.A.1.A 100 can be thought of as a bundle of ten tens — called a "hundred."					M				
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.	M	M	M	M	M	M	M	M	
2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.					M	M	M		M
2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.					M		M		
Use place value understanding and properties of operations to add and subtract.									
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	M	M	M	M		M	M		M
2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.		M				M	M		
2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.							M	M	M
2.NBT.B.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.					M	M	M	M	

2.NBT.B.9Explain why addition and subtraction strategies work, using place value and the properties of operations.		M					M		M
Measurement & Data									
Measure and estimate lengths in standard units.									
2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.			M			M			M
2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.			M						
2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.			M						
2.MD.A.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.			M						M
Relate addition and subtraction to length.									
2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.			M	M					M
2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.			M	M	M				
Work with time and money.									

2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.						S			
2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?						S			
Represent and interpret data.									
2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.			S						S
2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	S	S					S		
Geometry									
Reason with shapes and their attributes.									
2.G.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.1 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.						A			
2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.								A	
2.G.A.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three						A			

thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.									

UNIT 1: ADDING, SUBTRACTING, AND WORKING WITH DATA

Illustrative Mathematics Unit Focus: Students represent and solve story problems within 20 through the context of picture and bar graphs that represent categorical data. Students build toward fluency with addition and subtraction.

Essential Questions:
How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
Why is it important to learn basic facts?
Why do we collect, organize, represent and analyze data?

Unit Pacing: 25 days (14 required lessons, 9 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Grade 2 students build upon their work in Grade 1 in two major ways. They represent and solve situational problems of all three types which involve addition and subtraction within 100 rather than within 20, and they represent and solve two-step situational problems of all three types. Because some grade 2 students are still developing proficiency with the most difficult subtypes, two-step problems should not involve these subtypes. Most work with two-step problems should involve single-digit addends.	Recognizing how a real-world situation fits into a common operation category helps to solve the problem. Real-world and mathematical situations can be represented using drawings and equations. An unknown can be in any position in a mathematical situation. The equal sign tells us that the quantities on either side have the same value or balance.	Add Addend Sum Difference Subtract Compare Unknown number Equation Symbol Tape diagram
2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.	The word "fluent" is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number") and knowing some answers from the use of strategies. Fluency is not a matter of instilling facts divorced from	Knowing the basic facts helps us to solve more difficult computation problems accurately and efficiently.	Add Subtract Sum DIfference Strategies Fluently Compose

	their meanings, but rather as an outcome of a multi-year process that heavily involves the interplay of practice and reasoning.		Decompose
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Students need to build on their flexible strategies for adding within 100 from Grade 1 to fluently add and subtract within 100 in Grade 2. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Compose Decompose Addition Subtraction Relationship Solve Equation Unknown Expression
2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	Students in Grade 1 begin to organize and represent categorical data using marks or picture graphs. In grade 2, students represent data in picture and bar graphs. A bar graph representing categorical data displays no additional information beyond the category counts. In such a graph, the bars are a way to make the category counts easy to interpret visually. Students could discuss ways in which bar orientation (horizontal or vertical), order, thickness, spacing, shading, colors, and so forth make the bar graphs easier or more difficult to interpret.	We collect, organize, represent, and analyze data in order to answer a question or solve a problem. We can organize data in specific ways to help us interpret the data more easily.	Picture graph Bar graph Data set Table Compare Represent Title Label Horizontal Vertical

UNIT 1: ADDING, SUBTRACTING, AND WORKING WITH DATA

How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
Why is it important to learn basic facts?
Why do we collect, organize, represent and analyze data?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Add and Subtract Within 20				
2.NBT.B.5 2.OA.B.2	I can fluently add and subtract within 20. I can add and subtract within 100 using a variety of strategies.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** This opening section gives teachers opportunities to assess students' fluency with addition and subtraction facts within 10 and how they approach adding and subtracting. The first several lessons focus on making a ten as a strategy to add and subtract, which helps students gain fluency with facts within 20 and supports the work with larger numbers (such as composing and decomposing numbers as a way to add and subtract). In the last lesson of the section, students use strategies learned in grade 1 to add within 50. Some activities take place in centers, enabling teachers to also introduce routines and structures while helping students develop mental strategies for adding and subtracting.	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5
Pacing:	5 days		**Math Practices:** SMP 3, 5, 6, 7, 8	**Assessments:** Cool-down 3 Checkpoint A
Section B: Ways to Represent Data				
2.MD.D.10 2.NBT.B.5 2.OA.B.2	I can represent and interpret data using picture and bar graphs. I can represent and solve a variety of	X Selected Response	**Lesson Progression:** Students explore situations and problems that involve categorical data and learn new ways to represent such data.	**Mandatory Lessons/Activities:** iM Lessons 7, 8, 9, 10, 11

	word problems using addition and subtraction.	X Constructed Response Performance X Observation	Students begin by representing data about their class in a way that makes sense to them. Then, they are introduced to picture graphs and bar graphs. Students learn the conventions of these graphs as they create them. They discuss the types of questions that can be asked and answered by the graphs, including those that require combining and comparing different categories.	
Pacing:	5 days		**Math Practices:** SMP 1, 2, 3, 4, 6	**Assessments:** Cool-downs 9, 10 Checkpoint B
Section C: Diagrams To Compare				
2.MD.D.10 2.NBT.A.2 2.NBT.B.5 2.OA.A.1 2.OA.B.2	I can represent and solve a variety of word problems using addition and subtraction.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students have previously represented and reasoned about quantities in story problems. In grade 1, students compared quantities using diagrams with discrete partitions. In the previous section, they reasoned about quantities in bar graphs. Here, students learn to use tape diagrams as another way to make sense of the relationship between two quantities and between addition and subtraction. Students explore Compare story problems with an unknown difference, an unknown larger number, or an unknown smaller number. Tape diagrams help students to visualize these structures and support them in reasoning about strategies to use to solve problems, such as counting on or counting back. Students also write equations to reason about questions that ask “how many more?” and “how many less?” They recognize that different equations and diagrams can be used to represent the same difference between two numbers.	**Mandatory Lessons/Activities:** iM Lessons 13, 14, 15, 16
Pacing:	4 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 13, 15 Checkpoint C

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students might rely on a keyword or phrase in a problem to suggest an operation that will lead to an incorrect solution. For example, they might think that the word more always means that addition must be used to find a solution. Students may not completely solve a multi-step problem believing they are finished after completing one part. Students may misunderstand the meaning of the equal sign even if they have proficient computational skills. Students may not attend to the place value of the digits and believe that the 4 in 46 represents 4, not 40. This may also cause them to make errors in composing and decomposing tens. Students may not have a conceptual understanding of place value so they would think 61 – 47 = 26, because they subtract the 7 in 47 from the 1 in 61 instead of decomposing a ten. When answering a question such as, "*How many students in the class were born in January or in February?*", students may not understand that they need to combine these data points to determine the total.	2.OA.A.1: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 1.OA.A.1 2.OA.B.2: 1.OA.C.6 2.NBT.B.5: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 2.OA.B.2 2.MD.D.10: 1.MD.C.4	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			

Kendall Hunt
Blackline masters and materials from Teacher Resource Pack
Connecting cubes or counters, chart paper, glue, markers, scissors, stickers, tape, collection of objects

UNIT 2: ADDING AND SUBTRACTING WITHIN 100

Illustrative Mathematics Unit Focus: Students add and subtract within 100 using strategies based on place value, properties of operations, and the relationship between addition and subtraction. They then use what they know to solve story problems.

Essential Questions:
How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
Why is it important to learn basic facts?

Unit Pacing: 22 days (12 required lessons, 8 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Grade 2 students build upon their work in Grade 1 in two major ways. They represent and solve situational problems of all three types which involve addition and subtraction within 100 rather than within 20, and they represent and solve two-step situational problems of all three types. Because some grade 2 students are still developing proficiency with the most difficult subtypes, two-step problems should not involve these subtypes. Most work with two-step problems should involve single-digit addends.	Recognizing how a real-world situation fits into a common operation category helps to solve the problem. Real-world and mathematical situations can be represented using drawings and equations. An unknown can be in any position in a mathematical situation. The equal sign tells us that the quantities on either side have the same value or balance.	Add Addend Sum Difference Subtract Compare Unknown number Equation Symbol Tape diagram
2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.	The word "fluent" is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number") and knowing some answers from the use of strategies. Fluency is not a matter of instilling facts divorced from their meanings, but rather as an outcome of a	Knowing the basic facts helps us to solve more difficult computation problems accurately and efficiently.	Add Subtract Sum DIfference Strategies Fluently Compose Decompose

	multi-year process that heavily involves the interplay of practice and reasoning.		
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Students need to build on their flexible strategies for adding within 100 from Grade 1 to fluently add and subtract within 100 in Grade 2. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Compose Decompose Addition Subtraction Relationship Solve Equation Unknown Expression
2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	This work affords opportunities for students to see that they may have to compose more than one ten, and as many as three new tens.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations
2.NBT.B.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	Students in grade 1 add any two-digit number with a multiple of 10, and subtract multiples of 10 from multiples of 10. In second grade students should continue to develop proficiency with mental computation of multiples of 10 and 100.	The digit in the ones place will remain the same when finding 10 more or 10 less. The digits in the tens place and the ones place will remain the same when finding 100 more or 100 less.	Place value Operations Mentally add/subtract
2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.	In Grade 1, students add within 100 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Grade 1 students also begin to record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Grade	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler.	Place value Properties Operations Explain

	2 students further refine their ability to explain calculation strategies based on their place value understanding.	Subtraction is the opposite of or "undoes" addition.	

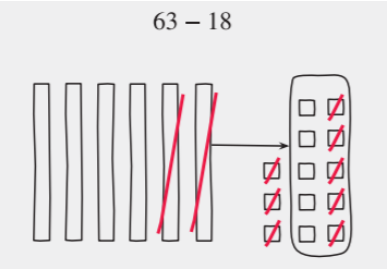
UNIT 2: ADD AND SUBTRACT WITHIN 100

How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
Why is it important to learn basic facts?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Add and Subtract				
2.MD.D.10 2.NBT.A.2 2.NBT.B.52 2.NBT.B.9 2.OA.A.1 2.OA.B.2	I can add and subtract within 100 using a variety of strategies. I can represent and solve a variety of word problems using addition and subtraction.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students find the value of unknown addends using methods that are based on place value and are introduced to base-ten blocks. They continue to rely on the relationship between addition and subtraction to solve problems involving differences. Students begin by solving Compare story problems. They use any methods and tools that make sense to them—including diagrams and connecting cubes—to find differences between two-digit numbers. Students then analyze the structure of base-ten blocks and use them to find unknown addends (MP7). Unlike connecting cubes, base-ten blocks cannot be pulled apart, which helps emphasize the structure of two-digit numbers in base ten. To reason about an unknown addend, they may add tens and ones to the known addend until they reach the value of the sum. They may also start with the total amount and subtract tens from tens and ones from ones to reach the known addend. The numbers encountered here do not require	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3

<table>
<tr><td></td><td></td><td></td><td>students to decompose a ten when they subtract by place value.</td><td></td></tr>
<tr><td>Pacing:</td><td>3 days</td><td></td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 1, 3
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Decompose to Subtract</td></tr>
<tr><td>2.NBT.B.52
2.NBT.B.62
2.NBT.B.8
2.NBT.B.9
2.OA.B.2</td><td>I can add and subtract within 100 using a variety of strategies.

I can represent and solve a variety of word problems using addition and subtraction.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students subtract one- and two-digit numbers from two-digit numbers within 100. To reason about differences of two numbers, they use methods based on place value, base-ten blocks and diagrams, and properties of operations. The numbers here require students to decompose a ten when subtracting by place.

Students also make sense of different representations of subtraction by place, including those that show their peers' reasoning. For example, to find the value of 63 - 18 , students might use base-ten blocks or drawings to represent tens and ones. In this case, they might decompose 1 ten from 63 and exchange it for 10 ones, making 5 tens and 13 ones. From here, some students may first take away 8 ones, and then 1 ten. Others may take away 1 ten, then 8 ones. When students discuss different approaches and explain why they result in the same value, they deepen their understanding of the properties of operations and place value.
 
The reasoning here builds a foundation for students to understand the standard algorithm for</td><td>Mandatory Lessons/Activities:
iM Lessons 5, 6, 7, 8, 9</td></tr>
</table>

			subtraction, but students should not be encouraged to use the notation for the standard algorithm at this point. Allow them to build conceptual understanding by reasoning with base-ten blocks and drawings and articulating their thinking.	
Pacing:	5 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 8, 9 Checkpoint B
Section C: Represent and Solve Story Problems				
2.NBT.B.52 2.NBT.B.62 2.NBT.B.8 2.OA.A.1 2.NBT.B.9 2.OA.B.2	I can represent and solve a variety of word problems using addition and subtraction.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students apply their knowledge to solve story problems that involve addition and subtraction within 100. The story problems include all types—Add To, Take From, Put Together/Take Apart, and Compare— and have unknowns in all positions. Previously, students worked with diagrams that represent Compare problems. Throughout this section, students also make sense of diagrams that could represent Put Together/Take Apart story problems. *Clare and Han are playing a game with seeds.* *Clare has 54 seeds on her side of the board.* *Han has 16 seeds on his side.* *How many seeds are on the board in all?* *Which diagram matches this story? Explain your match to your partner.*  As students relate quantities in context and diagrams that represent them, they practice reasoning quantitatively and abstractly (MP2). Throughout the section, students are invited to interpret and solve problems in the ways that make sense to them (MP1). Math tools such as connecting cubes and base-ten blocks should be made available to encourage methods based on place value and the properties of operations to	**Mandatory Lessons/Activities:** iM Lessons 11, 12, 13, 14

			solve the problems.	
Pacing:	4 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 11, 14 Checkpoint C

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may not attend to the place value of the digits and believe that the 4 in 46 represents 4, not 40. This may also cause them to make errors in composing and decomposing tens. Students might rely on a keyword or phrase in a problem to suggest an operation that will lead to an incorrect solution. For example, they might think that the word more always means that addition must be used to find a solution. Students may not completely solve a multi-step problem believing they are finished after completing one part. Students may misunderstand the meaning of the equal sign even if they have proficient computational skills. Students may not have a conceptual understanding of place value so they would think 61 – 47 = 26, because they subtract the 7 in 47 from the 1 in 61 instead of decomposing a ten.	2.OA.A.1: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 1.OA.A.1 2.OA.B.2: 1.OA.C.6 2.NBT.B.5: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 2.OA.B.2 2.NBT.B.6: 2.NBT.A.1, 2.NBT.B.7 2.NBT.B.8: 2.NBT.A.1 2.NBT.B.9: 1.OA.B.3, 1.OA.B.4	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			

Kendall Hunt
Blackline masters and materials from Teacher Resource Pack
Connecting cubes, base-ten blocks, counters, paper clips, chart paper, markers

UNIT 3: MEASURING LENGTH

Illustrative Mathematics Unit Focus: Students measure and estimate lengths in standard units and solve measurement story problems within 100.

Essential Questions:
Why do we use standard units of measurement?
How do we decide on a unit of measure and a tool when measuring an object?
How are the size of the unit and the resulting measure related?
Why do we collect, organize, represent and analyze data?

Unit Pacing: 23 days (14 required lessons, 7 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as	It is vital that students learn that "one" represents the space from the beginning of the ruler to the	Standard units help us communicate a measure to others in a consistent way.	Measure Estimate

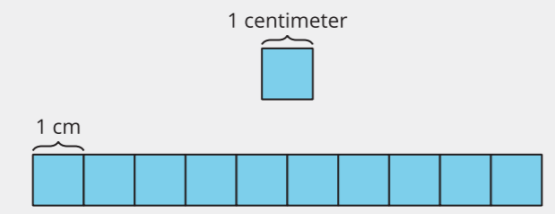
rulers, yardsticks, meter sticks, and measuring tapes	hash mark, not the hash mark itself. To learn measurement concepts and skills, students might use both simple rulers (e.g., having only whole units such as centimeters or inches) and physical units (e.g., manipulatives that are centimeter or inch lengths).	The unit of measure and tool must have the same attribute (e.g. length) we are measuring and be the most appropriate for the given situation.	Length Unit Inch Feet Centimeter Meter Ruler
2.MD.A.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	Students can learn that the larger the unit, the fewer number of units in a given measurement. That is, for measurements of a given length there is an inverse relationship between the size of the unit of measure and the number of those units. This is the time that measuring and reflecting on measuring the same object with different units, both standard and nonstandard, is likely to be most productive. Students can also use the concept of unit to make inferences about the relative sizes of objects; for example, if object A is 10 regular paper clips long and object B is 10 jumbo paper clips long, the number of units is the same, but the units have different sizes, so the lengths of A and B are different		
2.MD.A.3 Estimate lengths using units of inches, feet, centimeters, and meters.	Although “guess and check” experiences can be useful, research suggests explicit teaching of estimation strategies (such as iteration of a mental image of the unit or comparison with a known measurement) and prompting students to learn reference or benchmark lengths (e.g., an inch-long piece of gum, a 6-inch dollar bill), order points along a continuum, and build up mental rulers.	There is a relationship between the size of the unit and the number of units required to cover the length. Lengths can be estimated.	
2.MD.A.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.	Second graders learn to combine and compare lengths using arithmetic operations. That is, they can add two lengths to obtain the length of the whole and subtract one length from another to find out the difference in lengths.	Length is measured by using an appropriate tool. Numerals on a measuring tool indicate the number of length units. Lengths can be compared.	Measure Length Standard unit Difference Determine Compare

2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	This work supports students' understanding of solving one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.	Addition and subtraction strategies can be used to solve real-world measurement problems. A symbol can be used to represent an unknown number.	Units Length Equation Symbol Unknown
2.MD.D.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.	A display of measurement data must present the measured values with their appropriate magnitudes and spacing on the measurement scale in question. One method for doing this is to make a line plot. This activity connects with other work students are doing in measurement in Grade 2: representing whole numbers on number line diagrams, and representing sums and differences on such diagrams.	We collect, organize, represent, and analyze data in order to answer a question or solve a problem.	Measurement Units Line plot Data

UNIT 3: MEASURING LENGTH

Why do we use standard units of measurement?
How do we decide on a unit of measure and a tool when measuring an object?
How are the size of the unit and the resulting measure related?
Why do we collect, organize, represent and analyze data?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Metric Measurement				
2.MD.A.1 2.MD.A.2	I can estimate and measure length using a variety of tools. I can represent and solve a variety of	X Selected Response	**Lesson Progression:** This section introduces two metric units: centimeter and meter. Students use base-ten blocks, which have lengths of 1 centimeter and 10	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4, 5, 6

2.MD.A.3 2.MD.A.4 2.MD.B.5	word problems using addition and subtraction.	X Constructed Response Performance X Observation	centimeters, to measure objects in the classroom and to create their own centimeter ruler. Students iterate the 1-centimeter unit just as they had done with nonstandard units in grade 1. Students relate the side length of a centimeter cube to the distance between tick marks on their ruler. They see that each tick mark notes the distance in centimeters from the 0 mark, and that the length units accumulate as they move along the ruler and away from 0.  Students then compare the ruler they created to a standard centimeter ruler. They learn the importance of placing the end of an object at 0 and discuss how the numbers on the ruler represent lengths from 0. Students also learn about a longer unit in the metric system, meter, and use it to estimate lengths. They have opportunities to choose measurement tools and to do so strategically (MP5), by considering the lengths of objects being measured. Students also measure the length of longer objects in both centimeters and meters, which prompts them to relate the size of the unit to the measurement. To close the section, students apply their knowledge of measurement to compare the lengths of objects and solve Compare story problems involving lengths within 100, measured in metric units.	
Pacing:	6 days		**Math Practices:** SMP 1, 2, 3, 5, 6, 7, 8	**Assessments:** Cool-downs 3, 5, 6

<table>
<tr><td></td><td></td><td></td><td></td><td>Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Customary Measurement</td></tr>
<tr><td>2.MD.A.1
2.MD.A.2
2.MD.A.3
2.MD.B.5</td><td>I can estimate and measure length using a variety of tools.

I can describe the relationship between the size of the units used and the resulting measurements when measuring the same object.

I can represent and solve a variety of word problems using addition and subtraction.</td><td rowspan="2"><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students apply measurement concepts and skills from earlier to measure and estimate lengths in two customary units: inches and feet.

As in the previous section, students make choices about the tool to use based on the length of the object being measured (MP5) and measure the length of the same object in both feet and inches. They begin to generalize that when they use a longer length unit, fewer of those units are needed to span the full length of the object. This understanding is a foundation for their work with fractions in grade 3 and beyond.

To solidify their understanding of measurement concepts, students also solve one- and two-step story problems involving addition and subtraction of lengths within 100, expressed in customary units. Some problems involve measurements using a “torn tape” where the 0 cannot be used as a starting point.</td><td>Mandatory Lessons/Activities:
iM Lessons 8, 9, 10, 11, 12</td></tr>
<tr><td>Pacing:</td><td>5 days</td><td>Math Practices:
SMP 1, 2, 3, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 8, 9, 12
Checkpoint B</td></tr>
<tr><td colspan="5">Section C: Line Plot</td></tr>
<tr><td>2.MD.A.1
2.MD.A.3
2.MD.A.4
2.MD.B.5
2.MD.D.9</td><td>I can create line plots to display measurement data and use the data to solve problems.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students apply their understanding of measurement and data to create and interpret line plots. Students learn that the horizontal scale is marked off in whole-number length units, the same ones used to collect the data. They recognize that the numbers on the number line represent lengths and each “x” above a number represents an object of that length. They label line plots with titles and the measurement unit used. Throughout</td><td>Mandatory Lessons/Activities:
iM Lessons 14, 15, 16</td></tr>
</table>

			the section, students connect the features of the line plot to the tools they use to measure.	
Pacing:	3 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 15 Checkpoint C

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may believe that the numbers on a ruler are counting the tick marks instead of the units or spaces between the marks. Some students might think that they can only measure length with a ruler starting at the left edge or 0 instead of starting at another number and determining the number of length units used from end to end. Students may assume that a key word or phrase in a problem suggests the same operation will be used every time. Students may try to represent categorical data (i.e "Favorite Pets"or "Pizza Toppings") on a line plot. When creating a line plot, students may not space the tick marks equally along the line and may also omit numbers not included in the data set.	2.MD.A.1: 1.MD.A.2 2.MD.A.2: 2.MD.A.1, 2.MD.A.3 2.MD.A.3: 2.MD.A.1 2.MD.A.4: 2.MD.A.3 2.MD.B.5 : 2.MD.A.4	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			
Kendall Hunt			

Blackline masters and materials from Teacher Resource Pack
Base ten blocks, centimeter cubes, connecting cubes, straws, string, scissors, rulers (centimeters and inches), measuring tape, meter sticks, tape, objects of various lengths, colored pencils, inch tiles, markers, yard sticks

UNIT 4: ADDITION AND SUBTRACTION ON A NUMBER LINE

Illustrative Mathematics Unit Focus: Students learn about the structure of a number line and use it to represent numbers within 100. They also relate addition and subtraction to length and represent the operations on the number line diagram.

Essential Questions:
How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
How can a number line be used to represent numbers and equations?

Unit Pacing: 21 days (12 required lessons, 7 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

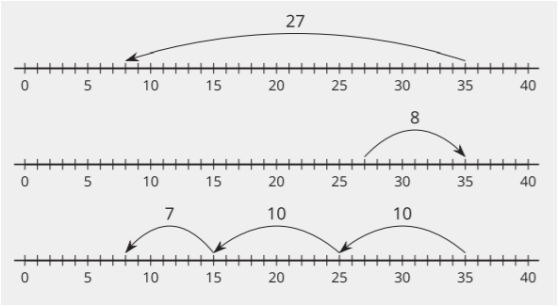
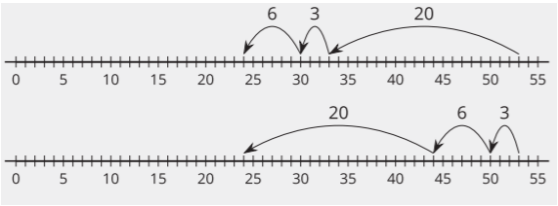
Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Grade 2 students build upon their work in Grade 1 in two major ways. They represent and solve situational problems of all three types which involve addition and subtraction within 100 rather than within 20, and they represent and solve two-step situational problems of all three types. Because some grade 2 students are still developing proficiency with the most difficult subtypes, two-step problems should not involve these subtypes. Most work with two-step problems should involve single-digit addends.	Recognizing how a real-world situation fits into a common operation category helps to solve the problem. Real-world and mathematical situations can be represented using drawings and equations. An unknown can be in any position in a mathematical situation. The equal sign tells us that the quantities on either side have the same value or balance.	Add Addend Sum Difference Subtract Compare Unknown Equation Expression Symbol Tape diagram
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.	Students begin to work towards multiplication when they skip count by 5s, by 10s, and by 100s. This skip counting is not yet true multiplication because students don't keep track of the number of groups they have counted.	Skip counting by a specific number creates a repeating pattern.	Skip-count Pattern

2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Students need to build on their flexible strategies for adding within 100 from Grade 1 to fluently add and subtract within 100 in Grade 2. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Compose Decompose Addition Subtraction Relationship Equation Unknown Expression
2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	This work supports students' understanding of solving one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.	Addition and subtraction strategies can be used to solve real-world measurement problems. A symbol can be used to represent an unknown number.	Units Length Equation Symbol Unknown
2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	To use a number line diagram to understand number and number operations, students need to understand that number line diagrams have specific conventions: the use of a single position to represent a whole number and the use of marks to indicate those positions. They need to understand that a number line diagram is like a ruler in that consecutive whole numbers are 1 unit apart, thus they need to consider the distances between positions and segments when identifying missing numbers.	On a number line, the size of the part is measured by the distance from zero to the numbered point.	Whole number Length Number line Sum Difference

UNIT 4: ADDITION AND SUBTRACTION ON A NUMBER LINE

How do we decide what operation to use when solving a real-world problem?
How can we show mathematical situations in word problems?
What does the equal sign mean in a number sentence?
How can a number line be used to represent numbers and equations?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: The Structure of a Number Line				
2.MD.B.6 2.NBT.A.2 2.NBT.B.5	I can represent whole numbers within 100 as lengths from 0 on a number line.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students begin to use the number line as a tool for understanding numbers and number relationships. They learn that the number line is a visual representation of numbers shown in order from left to right, with equal spacing between each number. Students see that each number tells the number of length units from 0, just like on the ruler. This means that the numbers to the left are smaller (fewer units away from 0) and those farther to the right are larger (more units away from 0). Students learn that whole numbers can be represented with tick marks and points on the number line. They then locate, label, and compare numbers on a number line. They also estimate numbers that could be represented by points on a number line.	**Mandatory Lessons/Activities:** iM lessons 1, 2, 3, 4, 5
Pacing:	5 days		**Math Practices:** SMP 3, 5, 6, 7, 8	**Assessments:** Cool-downs 3, 4, 5 Checkpoint A
Section B: Add and Subtract on a Number Line				
2.MD.B.5 2.MD.B.6	I can represent sums and differences on a number line.	X Selected Response	**Lesson Progression:** Students reason about sums and differences on the number line. They begin by using directional	**Mandatory Lessons/Activities:** iM Lessons 7, 8, 9, 10, 11, 12, 13

2.NBT.A.2 2.NBT.B.5 2.OA.A.1	I can represent and solve a variety of word problems using addition and subtraction.	X Constructed Response Performance X Observation	arrows: an arrow pointing right represents addition, and an arrow pointing left represents subtraction. Students write equations that correspond to given number-line representations, as well as represent given equations on the number line. Later, students revisit the idea of subtraction as an unknown-addend problem and represent the unknown addend with a jump to the right. For example, here are three ways they may reason about 35 - 27 on the number line:  As students analyze various representations of a difference on the number line, they consider when certain strategies may be more efficient than others. They also consider reasoning strategies that are based on place value and the properties of operations (for example, adding tens and then ones, or adding ones and then tens). For example, here are two ways to find 53 - 29:  At the end of the section, students use the number line to make sense of and solve story problems. Grade 2, Unit 4 6 Grade 2 They compare this representation with others used in earlier units.	
Pacing:	7 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 8, 9, 11, 13 Checkpoint B

COMMON MISCONCEPTIONS	PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT	ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY	OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT
Students may incorrectly think that subtraction is commutative, i.e. 8-5=5-8. Students may think that the unknown in an equation has to fall after the equal sign. Students sometimes believe that the equal sign indicates the answer comes next or calls for doing the mathematical operation. Students may confuse the direction of the arrows when representing both addition and subtraction problems on the number line. Students might rely on a key word or phrase in a problem to suggest an operation that will lead to an incorrect solution. For example, they might think that the word left always means that subtraction must be used to find a solution.	2.MD.B.5 2.MD.A.4 2.MD.B.6: 2.MD.B.5 2.NBT.B.5 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 2.OA.B.2 2.OA.A.1 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 1.OA.A.1	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

RESOURCES
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Base-ten blocks, erasers, inch tiles, paper clips, sticky notes, string, counters, number cubes, markers, markers (dry-erase), Sheet protectors, glue, scissors, base-ten blocks, colored pencils, paper, rulers

UNIT 5: NUMBERS TO 1,000

Illustrative Mathematics Unit Focus: Students extend place value understanding to three-digit numbers.

Essential Questions:
How is our number system organized?
How can understanding place value help us?

Unit Pacing: 19 days (11 required lessons, 6 flex, 2 assessment and reaction)

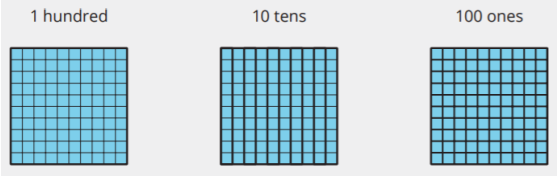
UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.	The word "fluent" is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number") and knowing some answers from the use of strategies. Fluency is not a matter of instilling facts divorced from their meanings, but rather as an outcome of a multi-year process that heavily involves the interplay of practice and reasoning.	Knowing the basic facts helps us to solve more difficult computation problems accurately and efficiently.	Add Subtract Sum DIfference Strategies Fluently Compose Decompose
2.NBT.A.1 Understand that 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. a)100 can be thought of as a bundle of ten tens - called a “hundred.” b) The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	This lays the groundwork for understanding the structure of the base-ten system as based on repeated bundling in groups of 10 and understanding that the unit associated with each place is 10 of the unit associated with the place to its right.	Our number system is a base-ten system. Any group of 10 in a given place value can be represented as one in the next greater place value (10 ones is 1 ten, 10 tens is 1 hundred).	Digit Hundreds Tens Ones
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.	Skip-counting is a fundamental skill that helps students develop an understanding of the numeric patterns in mathematics. These patterns help us compute fluently and efficiently. Numerical patterns also help us develop algebraic	Skip counting by a specific number creates a repeating pattern. To recognize and extend a pattern, we look for how the terms are related and	Skip-count

	reasoning. Skip-counting from multiples by multiples is a low-level form of skip-counting that may not fully develop students' understanding. We can also skip count by 10's off of the multiple of tens, such as asking students to skip count by tens starting at 17.	then continue that relationship for the next term.	
2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	Representations such as manipulative materials, math drawings, and layered three-digit place value cards afford connections between written three-digit numbers and hundreds, tens, and ones... Unlayering three-digit place value cards... reveals the expanded form of the number.	Understanding place value enables us to represent, compare and order numbers and perform computations.	Base ten numeral Number names Expanded form
2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	Comparing the magnitude of three-digit numbers uses the understanding that 1 hundred (the smallest three-digit number) is greater than any amount of tens and ones represented by a two-digit number. For this reason, three-digit numbers are compared by first inspecting the hundreds place (e.g., 845 > 799; 849 < 855). Drawings help support these understandings.		Hundreds Tens Ones Compare
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Fluency is grounded in understanding. Provide many activities that will help students develop a strong understanding of number relationships, addition and subtraction so they can develop, share and use efficient strategies for mental computation. An efficient strategy is one that can be done mentally and quickly. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use. Students need to build on their flexible strategies for adding within 100 in Grade 1 to fluently add and subtract within 100, add up to four two-digit numbers, and find sums and differences less than or equal to 1000 using numbers 0 to 1000.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or “undoes” addition.	Place Value Operations Add Subtract Sum Difference Equation

2.NBT.B.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	Students should first work to understand 10 more and 10 less than 3-digit numbers. This can be done in a variety of ways, and should be connected to base ten representations so that students can understand which place values change and why when we add or subtract a ten from a number. As students show proficiency with adding and subtracting 10, we can begin to focus on adding and subtracting 100 from a number. Again, use of base ten models will help students understand what is happening mathematically. Then, students should work related equations to reinforce the patterns within these computations.	The digit in the ones place will remain the same when finding 10 more or 10 less. The digits in the tens place and the ones place will remain the same when finding 100 more or 100 less.	Place Value Operations Mentally add/subtract Sum Difference Equation
2.MD.B.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.	To use a number line diagram to understand number and number operations, students need to understand that number line diagrams have specific conventions: the use of a single position to represent a whole number and the use of marks to indicate those positions. They need to understand that a number line diagram is like a ruler in that consecutive whole numbers are 1 unit apart, thus they need to consider the distances between positions and segments when identifying missing numbers	Number lines can help us visualize the magnitude of a number as the distance from zero.	Whole number Length Number line Sum Difference Equal Partition

UNIT 5: NUMBERS TO 1,000				
How is our number system organized? How can understanding place value help us?				
CCSS Standards #	**Learning Targets**	**Summative Assessment Strategy**	**Lesson Progression and Connection to Math Practices**	**Common Learning Experiences and Assessments**
Section A: The Value of Three Digits				

<table>
<tr>
<td>2.OA.B.2
2.NBT.A.1
2.NBT.A.2
2.NBT.A.3
2.NBT.B.5
2.MD.B.6</td>
<td>I can read, write and represent numbers to 1,000.</td>
<td rowspan="2">
<table>
<tr><td>X</td><td>Selected Response</td></tr>
<tr><td>X</td><td>Constructed Response</td></tr>
<tr><td></td><td>Performance</td></tr>
<tr><td>X</td><td>Observation</td></tr>
</table>
</td>
<td>Lesson Progression:
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.
 

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.

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.</td>
<td>Mandatory Lessons/Activities:
iM Lessons 1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>Pacing:</td>
<td>6 days</td>
<td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td>
<td>Assessments:
Cool-downs 3, 5, 6
Checkpoint A</td>
</tr>
<tr>
<td colspan="5">Section B: Compare and Order Numbers Within 1,000</td>
</tr>
<tr>
<td>2.NBT.A.1
2.NBT.A.2
2.NBT.A.3
2.NBT.A.4
2.NBT.B.8</td>
<td>I can compare and order three-digit numbers.

I can represent whole numbers up to 1,000 as lengths from 0 on a number line.</td>
<td>
<table>
<tr><td>X</td><td>Selected Response</td></tr>
<tr><td>X</td><td>Constructed Response</td></tr>
</table>
</td>
<td>Lesson Progression:
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</td>
<td>Mandatory Lessons/Activities:
iM Lessons 8, 9, 10, 11, 12</td>
</tr>
</table>

2.MD.B.6		<table><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table>	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 =.	
Pacing:	5 days		**Math Practices:** SMP 3, 5, 6, 7, 8	**Assessments:** Cool-downs 8, 11, 12 Checkpoint B

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Some students may not move beyond thinking of the number 358 as 300 ones plus 50 ones plus 8 ones to the concept of 8 ones, 5 tens and 3 hundreds.	2.OA.B.2: 1.OA.C.6 2.NBT.A.1: 1.NBT.B.2, 2.NBT.A.2 2.NBT.A.3: 2.NBT. A.1 2.NBT.A.4: 2.NBT. A.1	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

Students may use place value blocks incorrectly assuming the value of each block is one instead of using the values hundreds, tens, or ones. Students may mistakenly use bigger than or smaller than rather than greater than or less than when comparing numbers. Students may count the lines on a number line instead of counting the spaces to represent a number.	2.NBT.B.5: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 2.OA.B.2 2.NBT.B.8: 2.NBT.A.1		
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Base-ten blocks, number cubes, chart paper, number cards 0–10, dry erase markers, sheet protectors, collections of objects, sticky notes			

UNIT 6: GEOMETRY, TIME, AND MONEY

Illustrative Mathematics Unit Focus: Students reason with shapes and their attributes and partition shapes into equal shares, building a foundation for fractions. They relate halves, fourths, and skip-counting by 5 to tell time, and solve story problems involving the values of coins and dollars.

Essential Questions:
How can polygons be described and classified?
How does partitioning help us reason about shapes?
How are clocks useful?
How can we determine the value of coins and bills?
How can we represent a given amount of money?

Unit Pacing: 26 days (16 required lessons, 8 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.	Skip-counting is a fundamental skill that helps students develop an understanding of the numeric patterns in mathematics. These patterns help us compute fluently and efficiently. Numerical patterns also help us develop algebraic reasoning. Skip-counting from multiples by multiples is a low-level form of skip-counting that may not fully develop students' understanding. We can also skip count by 10's off of the multiple of tens, such as asking students to skip count by tens starting at 17.	Skip counting by a specific number creates a repeating pattern. To recognize and extend a pattern, we look for how the terms are related and then continue that relationship for the next term.	Skip count
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Students need to build on their flexible strategies for adding within 100 from Grade 1 to fluently add and subtract within 100 in Grade 2. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or “undoes” addition.	Place value Operations Compose Decompose Addition Subtraction Relationship Equation Unknown Expression

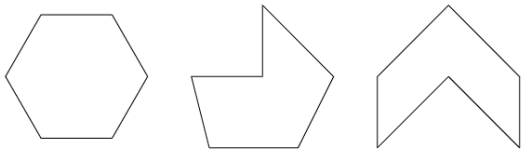
2.G.A.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.* Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	Students learn to name and describe the defining attributes of categories of two-dimensional shapes, including circles, triangles, squares, rectangles, rhombuses, trapezoids, and the general category of quadrilateral. They describe pentagons, hexagons, septagons, octagons, and other polygons by the number of sides, for example, describing a septagon as either a "seven-gon" or simply "seven-sided shape" Because they have developed both verbal descriptions and a rich store of associated mental images, they are able to draw shapes with specified attributes, such as a shape with five sides or a shape with six angles. They use length to identify the properties of shapes (e.g., a specific figure is a rhombus because all four of its sides have equal length). They recognize right angles, and can explain the distinction between a rectangle and a parallelogram without right angles and with sides of different lengths (sometimes called a "rhomboid").	Polygons can be described and classified using attributes, such as number of sides and angles.	Attribute Angle Face Triangle Quadrilateral Pentagon Hexagon Cube Rhombus
2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Another type of composition and decomposition is essential to students' mathematical development—spatial structuring. Students need to conceptually structure an array to understand two-dimensional regions as truly two-dimensional. This involves more learning than is sometimes assumed. Students need to understand how a rectangle can be tiled with squares lined up in rows and columns. At the lowest level of thinking, students draw or place shapes inside the rectangle, but do not cover the entire region. Only at the later levels do all the squares align vertically and horizontally, as the students learn to compose this two-dimensional shape as a collection of rows of squares and as a collection of columns of squares	Partitioning a shape into smaller parts allows us to describe the shape in different ways.	Partition Equal Rectangle Column Row
2.G.A.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of,	Students learn to combine their composition and decomposition competencies to build and operate on composite units (units of units),	Partitioning a shape into smaller parts allows us to describe the shape in different ways.	Partition Circle Halves

etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	intentionally substituting arrangements or composites of smaller shapes or substituting several larger shapes for many smaller shapes, using geometric knowledge and spatial reasoning to develop foundations for area, fraction, and proportion. For example, they build the same shape from different parts, e.g., making with pattern blocks, a regular hexagon from two trapezoids, three rhombuses, or six equilateral triangles. They recognize that the hexagonal faces of these constructions have equal area, that each trapezoid has half of that area, and each rhombus has a third of that area.		Thirds Fourths Half of A third of A fourth of Equal shares Whole
2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	It is vital that students learn that “one” represents the space from the beginning of the ruler to the hash mark, not the hash mark itself. To learn measurement concepts and skills, students might use both simple rulers (e.g., having only whole units such as centimeters or inches) and physical units (e.g., manipulatives that are centimeter or inch lengths).	Standard units help us communicate a measure to others in a consistent way. The unit of measure and tool must have the same attribute (e.g. length) we are measuring and be the most appropriate for the given situation.	Measure Estimate Length Unit Inch Feet Centimeter Meter Ruler
2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	Students have experience in telling and writing time from analog and digital clocks to the hour and half hour in Grade 1 and to the nearest five minutes, using a.m. and p.m. in Grade 2. Now students will tell and write time to the nearest minute and measure time intervals in minutes. Provide analog clocks that allow students to move the minute hand. Students need experience representing time from a digital clock to an analog clock and vice versa.	Clocks help us keep track of time and plan and sequence events.	Analog Digital Clock Hands Time Hour Minute A.M. P.M.
2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	Students also combine competencies from different domains as they solve measurement problems involving money amounts using addition and subtraction. For example, “How much change from $1.00 will Han have if he buys a bag of chips for 46¢? ” Students may use tape or number line diagrams for solving such problems.	Specific coins and bills each have a unique value that is determined by their markings. The size and color do not indicate a coin’s value. A given amount of money can often be generated using different combinations	Dollar Cents Quarter Dime Nickel Penny Symbols: $, ¢

		of coins and bills, but the value will remain the same.	

UNIT 6: GEOMETRY, TIME, AND MONEY

How can polygons be described and classified?
How does partitioning help us reason about shapes?
How are clocks useful?
How can we determine the value of coins and bills?
How can we represent a given amount of money?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Attributes of Shapes				
2.G.A.1 2.MD.A.1	I can identify and draw shapes with specific attributes.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students identify and draw triangles, quadrilaterals, pentagons, and hexagons. Students are likely familiar with triangles and hexagons given their previous work with pattern blocks. Here, they see that hexagons include any shape with six sides and six corners, and may look different from the pattern block they worked with in the past. For example, each of these shapes is a hexagon:  Students learn to name a shape by counting the sides and corners and come to see that, in any shape, the number of corners is the same as the number of sides. (The term “corners” is used in lieu of “vertices” because the latter requires an understanding of angles, which is developed in grade 4.)	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4

<table>
<tr><td></td><td></td><td></td><td>Students come to recognize that some shapes such as rectangles and squares have “square corners,” the informal language for 90-degree angles. As they identify and draw shapes with given attributes, they measure length in centimeters and inches, revisiting previously learned skills.

At the end of the section, students relate two-dimensional (flat) shapes to three-dimensional (solid) shapes. They see that flat shapes make up the faces of solid shapes and identify solid shapes based on the flat shapes that constitute them.</td><td></td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP 3, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 1, 3
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Halves, Thirds, and Fourths</td></tr>
<tr><td>2.G.A.1
2.G.A.2
2.G.A.3
2.NBT.A.2</td><td>I can partition shapes into halves, thirds and fourths.

I can identify and describe halves, thirds and fourths.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students learn that shapes can be partitioned into two, three, or four equal pieces called halves, thirds, and fourths or quarters.

Students begin by composing shapes using pattern blocks, initially using any combination. Later, they use a single type of pattern block, which allows them to see the composed shape as partitioned into equal pieces.

In grade 1, students partitioned shapes into two and four equal pieces, and described each piece as a half or a fourth or quarter. (To prepare students to tell time to the quarter hour in the next section, be sure that they hear and use fourths and quarters interchangeably.) Here, they add the term “thirds” to their vocabulary and partition rectangles into halves, thirds, and fourths.

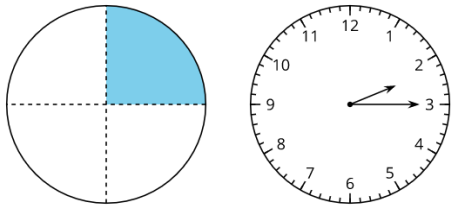
Students then identify equal-size pieces in shapes, which are partitioned in different ways to build an understanding that equal-size pieces of the same</td><td>Mandatory Lessons/Activities:
iM Lessons 6, 7, 8, 9</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>whole do not need to be the same shape.

They come to understand that if the whole is partitioned into the same number of equal pieces, the names of the pieces are the same. Students also learn that 2 halves, 3 thirds, and 4 fourths each make up one whole.

Although students are expected to use the language of fractions (halves, thirds, and fourths), they are not expected to use the word “fraction” or see fractions in numerical form until grade 3.</td><td></td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP 3, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 8, 9
Checkpoint B</td></tr>
<tr><td colspan="5">Section C: Time on the Clock</td></tr>
<tr><td>2.G.A.1
2.MD.C.7
2.NBT.A.2</td><td>I can tell time to the nearest five minutes.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students use their understanding of fourths and quarters to tell time.

In grade 1, students learned to tell time to the hour and half-hour. Here, they make a connection between the analog clock and circles partitioned into halves or fourths.

Students use the phrases “half past,” “quarter past,” and “quarter till” to tell time. They skip-count by 5 to tell time in 5-minute intervals.

Students recognize that the hour hand on an analog clock moves towards the next hour as time passes. They represent time on analog clocks by</td><td>Mandatory Lessons/Activities:
iM Lessons 11, 12, 13</td></tr>
</table>

<table>
<tr><td></td><td></td><td rowspan="3"></td><td>drawing the hour and minute hands and writing the time with digits.

Students recognize that, as time passes, the hour hand on an analog clock moves towards the next hour. They learn that each hour comes around twice a day on a 12-hour clock, and is labeled with “a.m.” and “ p.m.” to distinguish between times of day. Towards the end of this section, students relate a.m. and p.m. times to their daily activities.</td><td></td></tr>
<tr><td>Pacing:</td><td>3 days</td><td>Math Practices:
SMP 3, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 12, 13
Checkpoint C</td></tr>
<tr><td colspan="5">Section D: The Value of Money</td></tr>
<tr><td>2.G.A.1
2.MD.C.8
2.NBT.A.2</td><td>I can determine the value of a collection of coins.

I can represent and solve a variety of word problems using addition and subtraction.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students learn about money concepts while continuing to develop fluency with addition and subtraction within 100. They identify coins such as quarters, dimes, nickels, and pennies, and find the total value of different coin combinations.Students learn that 1 dollar has the same value as 100 cents and solve problems involving dollars and cents. Although students will not need to use decimal notation to represent money, they are expected to appropriately use the symbols $ and ¢.

Students are likely to have some previous experience with dollars and cents. Encourage them to share their experiences throughout the section. Consider creating an anchor chart of pictures of each coin and its value so that all students can access the content. As much as possible, give students access to real or plastic coins to support their reasoning.</td><td>Mandatory Lessons/Activities:
iM Lessons 15, 16, 17, 18, 19</td></tr>
<tr><td>Pacing:</td><td>5 days</td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 18, 19
Checkpoint D</td></tr>
</table>

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Some students might confuse the hour and minute hands. For the time of 3:45, they may say the time is 9:15. Also, some students name the numeral closest to the hands, regardless of whether this is appropriate. For instance, for the time of 3:45 they say the time is 3:09 or 9:03. Students might count coins as individual objects. Also some students think that the value of a coin is directly related to its size, so the bigger the coin, the more it is worth. Some students may think that a shape is named differently due to its orientation. They may see a rectangle with the longer side as the base, but claim that the same rectangle with the shorter side as the base is a different shape.  Students may believe that a shape divided into three parts represents thirds even though they are not equal parts.	2.NBT.B.5: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 2.OA.B.2 2.G.A.1: 1.G.A.1 2.G.A.3: 1.GA.3, 2.GA.2 2.MD.A.1: 1.MD.A.2 2.MD.C.7: 1.MD.B.3	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

RESOURCES
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Materials from previous activities and centers, rulers, geoblocks, scissors, tape, tools for creating a visual display, pattern blocks, construction paper, colored pencils, paper, chart paper, glue, picture books, card stock

UNIT 7: ADDING AND SUBTRACTING WITHIN 1,000

Illustrative Mathematics Unit Focus: Students use place value understanding, the relationship between addition and subtraction, and properties of operations to add and subtract within 1,000.

Essential Questions:
How is our number system organized?
How can understanding place value help us?
How do the properties of operations make computation simpler?

Unit Pacing: 23 days (14 required lessons, 7 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

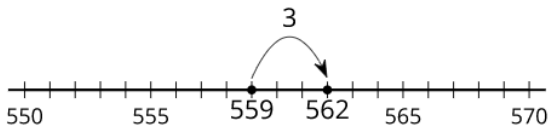
Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.	This lays the groundwork for understanding the structure of the base-ten system as based on repeated bundling in groups of 10 and understanding that the unit associated with each place is 10 of the unit associated with the place to its right.	Our number system is a base-ten system. Any group of 10 in a given place value can be represented as one in the next greater place value (10 ones is 1 ten, 10 tens is 1 hundred).	Digit Hundreds Tens Ones
2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.	Students begin to work towards multiplication when they skip count by 5s, by 10s, and by 100s. This skip counting is not yet true multiplication because students don't keep track of the number of groups they have counted.	Skip counting by a specific number creates a repeating pattern.	Skip count
2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	Representations such as manipulative materials, math drawings, and layered three-digit place value cards afford connections between written three-digit numbers and hundreds, tens, and ones... Unlayering three-digit place value cards... reveals the expanded form of the number.	Understanding place value enables us to represent, compare and order numbers and perform computations.	Base ten numerals Number names (0 - 1,000) Expanded form Hundreds Tens Ones
2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones	Comparing the magnitude of three-digit numbers uses the understanding that 1 hundred (the smallest three-digit number) is greater than any		Hundreds Tens Ones

digits, using >, =, and < symbols to record the results of comparisons.	amount of tens and ones represented by a two-digit number. For this reason, three-digit numbers are compared by first inspecting the hundreds place (e.g., 845 > 799; 849 < 855). Drawings help support these understandings.		Compare
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Students need to build on their flexible strategies for adding within 100 from Grade 1 to fluently add and subtract within 100 in Grade 2. Students gain computational fluency, using efficient and accurate methods for computing, as they come to understand the role and meaning of arithmetic operations in number systems. Efficient mental processes become automatic with use.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Compose Decompose Addition Sum Subtraction Difference Relationship Equation Unknown Expression
2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.	This work affords opportunities for students to see that they may have to compose more than one ten, and as many as three new tens.	Understanding place value enables us to represent, compare and order numbers and perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Addition Sum
2.NBT.B.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	Students apply their understanding of three-digit numbers from 2.NBT.A.1 to adding and subtracting like place values. Students can explain their addition and subtraction within 1,000 using physical tools, drawings, and number lines by illustrating adding like units and showing newly composed or decomposed units. Drawings can also help explain written methods.	Understanding place value enables us to perform computations. Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. Subtraction is the opposite of or "undoes" addition.	Place value Operations Compose Decompose Concrete model Strategy Drawing Written method

2.NBT.B.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	Students in grade 1 add any two-digit number with a multiple of 10, and subtract multiples of 10 from multiples of 10. In second grade students should continue to develop proficiency with mental computation of multiples of 10 and 100.	The digit in the ones place will remain the same when finding 10 more or 10 less. The digits in the tens place and the ones place will remain the same when finding 100 more or 100 less.	Place value Operations Mentally add/subtract
2.NBT.B.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.	In Grade 1, students add within 100 using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and	Understanding place value enables us to represent, compare and order numbers and perform computations.	Place value Properties Operations

UNIT 7: ADDING AND SUBTRACTING WITHIN 1,000

How is our number system organized?
How can understanding place value help us?
How do the properties of operations make computation simpler?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Add and Subtract within 1,000 without Composition or Decomposition				
2.NBT.A.2 2.NBT.A.4 2.NBT.B.5 2.NBT.B.7 2.NBT.B.8 2.NBT.B.9	I can add and subtract within 1,000 using a variety of strategies.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students add and subtract within 1,000 using methods where they do not explicitly compose or decompose a ten or a hundred. The number line is used early in this section to help students recognize that when numbers are relatively close, they can count on or count back to find the value of the difference. For example, they may count on from 559 to 562 to find 562 - 559.  Students also analyze counting sequences of	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4

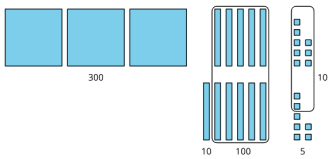
<table>
<tr><td></td><td></td><td></td><td>three-digit numbers that increase or decrease by 10 or 100. They observe patterns in place value before adding and subtracting multiples of 10 or 100.

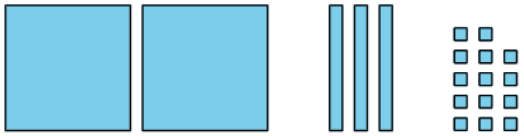
Students then engage with problems and expressions that encourage them to reason about sums and differences using the relationship between addition and subtraction and the properties of operations.

Later in the section, students analyze and make connections between methods that use different representations, such as number lines, base-ten diagrams, and equations. They then use methods or representations that make sense to them to add and subtract three-digit numbers.</td><td></td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 2, 3
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Add within 1,000 using Place Value Strategies</td></tr>
<tr><td>2.NBT.B.5
2.NBT.B.6
2.NBT.B.7
2.NBT.B.8
2.NBT.B.9</td><td>I can add and subtract within 1,000 using a variety of strategies.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students use strategies based on place value to add three-digit numbers. They learn that it is sometimes necessary to compose a hundred from 10 ones to find the value of such sums.

Students begin with sums that allow them to decide when to make a ten. They then work with larger values in the tens place and determine when to compose a hundred. As the lessons progress, they encounter sums of two- and three-digit numbers that involve composing two units.

Throughout the section, students analyze and use representations such as base-ten blocks, base-ten diagrams, expanded form, and other equations to build conceptual understanding and show place value reasoning. They also develop their understanding of the properties of operations as</td><td>Mandatory Lessons/Activities:
iM Lessons 6, 7, 8, 9, 10</td></tr>
</table>

			they observe that the order in which they add the units doesn't affect the value of the sum. *What is the same and what is different about how Priya and Lin found 358 + 67?* *Priya's work*  $300 + 100 + 10 + 10 + 5$ $400 + 20 + 5 = 425$ *Lin's work* 3 hundreds + 11 tens + 15 ones 11 tens = 110 15 ones = 15 300 + 110 + 15 = 425 Later in the section, students add within 1,000 using any method they have learned and thinking flexibly about the numbers they are adding.	
Pacing:	5 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 10 Checkpoint B
Section C: Subtract within 1,000 using Place Value Strategies				
2.NBT.A.1 2.NBT.A.2 2.NBT.A.3 2.NBT.B.7 2.NBT.B.8 2.NBT.B.9	I can add and subtract within 1,000 using a variety of strategies.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** As they have done when adding, students subtract numbers within 1,000 using place value strategies that involve decomposing a ten, a hundred, or both. This work builds on their previous experience of subtracting two-digit numbers by place value and decomposing a ten. Students use base-ten blocks to subtract hundreds from hundreds, tens from tens, and ones from ones, which offers a concrete experience of exchanging a ten for 10 ones or a hundred for 10 tens as needed. Along the way, they begin to think strategically about how to decompose the minuend when using base-ten blocks or diagrams. They learn that by	**Mandatory Lessons/Activities:** iM Lessons 12, 13, 14, 15, 16

			analyzing the value of the digits in each place, they can initially represent the minuend in a way that would require decomposing fewer units when subtracting by place. For example, this is a helpful way to represent 244 if we are subtracting a number with more than 4 ones, such as when finding 244 - 67:  **Base ten diagram. 2 hundreds, 3 tens, 14 ones.** Throughout the section, students compare the steps they use to decompose units and the different ways to represent and record the units being decomposed. The section ends with students choosing subtraction methods flexibly. They apply their understanding of place value, the relationship between addition and subtraction, and the properties of operations, to analyze number relationships and decide how to find the value of differences within 1,000**.**	
Pacing:	5 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 16 Checkpoint C

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students may not have a conceptual understanding of place value so that they would think 234 is 2+3+4 rather than 200+30+4 and may not see the relevance of the zeros. Students may not have a conceptual understanding of place value so they would think 561 – 147 = 426, because they subtract the 7 in 147 from the 1 in 561 instead of regrouping. When adding three-digit numbers, students may not know what to do with newly composed tens or hundreds. They may try to write both digits in a single place or ignore the newly composed units. When subtracting three-digit numbers, students may not correctly decompose from a higher place value.	2.NBT.A.3: 2.NBT.A.1 2.NBT.A.4: 2.NBT.A.1 2.NBT.B.5: 1.NBT.C.4, 1.NBT.C.5, 1.NBT.C.6, 1.OA.B.2 2.NBT.B.7: 2.NBT.A.1 2.NBT.B.8: 2.NBT.A.1 2.NBT.B.9: 2.NBT.A.1	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources

RESOURCES
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Base-ten blocks, number cubes, paper clips, two-color counters, materials from previous centers, number cards 0-10

UNIT 8: EQUAL GROUPS

Illustrative Mathematics Unit Focus: Students work with equal groups of objects to gain foundations for multiplication.

Essential Questions:
Why is a group of objects odd or even?
How can I represent an array of objects using numbers and symbols?
How does partitioning help us reason about shapes?

Unit Pacing: 15 days (11 required lessons, 2 flex, 2 assessment and reaction)

UNWRAPPED STANDARDS

Grade Level Standard	Standard Progression	Concepts (Big Ideas/ Understandings)	Academic Vocabulary (Standard Based)
2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers.	The word "fluent" is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number") and knowing some answers from the use of strategies. Fluency is not a matter of instilling facts divorced from their meanings, but rather as an outcome of a multi-year process that heavily involves the interplay of practice and reasoning.	Knowing the basic facts helps us to solve more difficult computation problems accurately and efficiently.	Add Subtract Sum Difference Strategies Fluently Compose Decompose
2.OA.C.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	Even and odd can be explained in a variety of ways. Students should be able to use various representations to explain if a number is even or odd. They then connect their models to equations to prove a number is even or odd. For example, 10 is even as it is equivalent to 5 + 5.	An even number is the sum of two equal addends.	Odd Even Equation Sum Addend Object Pairing Equal
2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	An array is an arrangement of objects in rows and columns. Each row has the same number of objects in it. One can repeatedly add the values in an array to find the total. In grade 3, students will connect the act of finding the total number of objects to multiplication.	An array can be represented by a repeated addition problem.	Rows Columns Rectangular arrays Equation Sum Addend

2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	Students need to understand how a rectangle can be tiled with squares lined up in rows and columns. Students learn to compose this two-dimensional shape as a collection of rows of squares and as a collection of columns of squares. In third grade, students will build upon these concepts as they study area measurement.	Partitioning a shape into smaller parts allows us to describe the shape in different ways.	Partition Rectangle Column Row

UNIT 8: EQUAL GROUPS

Why is a group of objects odd or even?
How can I represent an array of objects using numbers and symbols?
How does partitioning help us reason about shapes?

CCSS Standards #	Learning Targets	Summative Assessment Strategy	Lesson Progression and Connection to Math Practices	Common Learning Experiences and Assessments
Section A: Odd and Even				
2.OA.B.2 2.OA.C.3	I can determine whether a number is even or odd and write an equation to justify my answer.	X Selected Response X Constructed Response Performance X Observation	**Lesson Progression:** Students learn about odd and even numbers, building on their experience with sharing objects with another person or with making pairs out of a set of objects. They begin by noticing that some groups of objects can be made into two equal groups without a “leftover” and other groups can be made into two equal groups with “1 leftover.” The same pattern can be seen when pairing objects. After learning the terms, students focus on explaining why a group has an even number or an odd number of members. They do so by showing whether the objects can be made into two equal groups or be paired without a leftover, or whether they can skip-count by 2 to count the entire collection. The representations used here support students as they progress from explaining even and odd	**Mandatory Lessons/Activities:** iM Lessons 1, 2, 3, 4

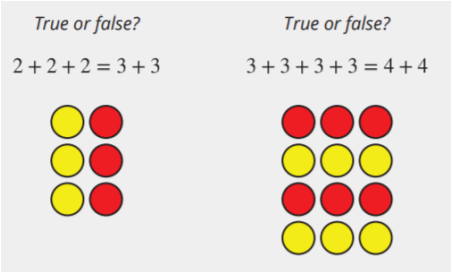
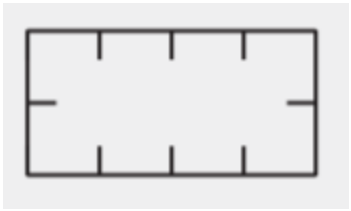
<table>
<tr><td></td><td></td><td></td><td>numbers informally to doing so more formally. They also pave the way for students to make sense of representations of multiplication in grade 3. Early lessons encourage the teacher to record student thinking using diagrams of equal groups or by arranging objects in rows and columns. Both recording strategies help students see and count pairs of objects.

Students begin to see how objects arranged in rows and columns can show equal groups or pairs. They will learn more about this arrangement and the term “array” in the next section.

To focus the work on building a foundation for multiplication and division, counters or connecting cubes should be available to students throughout the section, including during cool-downs.</td><td></td></tr>
<tr><td>Pacing:</td><td>4 days</td><td></td><td>Math Practices:
SMP 1, 2, 3, 4, 5, 6, 7, 8</td><td>Assessments:
Cool-downs 1, 3, 4
Checkpoint A</td></tr>
<tr><td colspan="5">Section B: Rectangular Arrays</td></tr>
<tr><td>2.G.A.2
2.OA.B.2
2.OA.C.3
2.OA.C.4</td><td>I can represent an array as the sum of equal addends and skip count to find the total.

I can partition a rectangle into rows and columns of same size squares and find the total number of squares in the array.</td><td><table><tr><td>X</td><td>Selected Response</td></tr><tr><td>X</td><td>Constructed Response</td></tr><tr><td></td><td>Performance</td></tr><tr><td>X</td><td>Observation</td></tr></table></td><td>Lesson Progression:
Students learn that a rectangular array contains objects arranged into rows and columns, with the same number of objects in each row and the same in number in each column.

Using this structure, students can skip count by the number in each row or in each column to find the total number of objects. They can also write equations with equal addends representing the number of objects in a row or a column.
Later in the section, students relate their work with arrays to the partitioning of shapes into equal parts.</td><td>Mandatory Lessons/Activities:
iM Lessons 7, 8, 9, 10, 11, 12</td></tr>
</table>

			 Students build rectangles by arranging square tiles into rows and columns, and then partition rectangles into rows and columns. *Use 8 tiles to build a rectangle. Arrange them in 2 rows.Partition this rectangle to match the rectangle you made.*  Rectangles in this section have up to 5 rows and 5 columns. Students are not expected to name the fractional units created by partitioning shapes. The focus is on using the structure of the rows and columns created by the partitions to count the total number of equal-size squares. This work serves as a foundation for students' future study of multiplication and area measurement.	
Pacing:	6 days		**Math Practices:** SMP 1, 2, 3, 4, 5, 6, 7, 8	**Assessments:** Cool-downs 9, 11 Checkpoint B

ADDITIONAL CONSIDERATIONS			
COMMON MISCONCEPTIONS	**PRIOR KNOWLEDGE NEEDED TO MASTER STANDARDS FOR THIS UNIT**	**ADVANCED STANDARDS FOR STUDENTS WHO HAVE DEMONSTRATED PRIOR MASTERY**	**OPPORTUNITIES FOR STUDENT-DIRECTED LEARNING WITHIN THE UNIT**
Students might memorize that even numbers end in 0, 2, 4, 6, 8 or odd numbers end in 1, 3, 5, 7, and 9 but not understand the meaning of evenness. These students may not be able to use objects, drawings, or equations to show why a given amount is odd or even. Students will determine whether a number is odd or even by the first digit in the number instead of the digit in the ones place. Students may confuse the terms row and columns and interchange them when writing a repeated addition sentence. The focus should be on the repeated addition of the representation.	2.OA.B.2: 1.OA.C.6, 1.OA.A.1 2.OA.C.3: 1.OA.D.7 2.OA.C.4: 1.OA.D.7	Choose from iM leveled centers and exploration problems to differentiate for students who are ready.	iM Centers District-approved online resources
RESOURCES			
Kendall Hunt Blackline masters and materials from Teacher Resource Pack Connecting cubes or counters, chart paper, crayons or colored pencils, dry erase markers, sheet protectors, inch tiles, rulers			