

► First Grade Unit 4: Leapfrogs on the Number Line

Big Conceptual Idea: [K-5 Progression on Counting and Cardinality and Operations and Algebraic Thinking](#) (pp.1-7, 12-17), [K-5 Progression on Number and Operations in Base Ten](#) (pp.1-4, 6-7), [K-6 Progression on Measurement and Data \(Measurement Part\)](#) (pp.1-4, 8-11)

Read the Bridges [Unit Overview/Introduction for Unit 4](#) pp. i-vi. Also, read each [Module Overview](#) for the current week's sessions, and the current [Session Summary](#) along with details for the teaching of each session as you work through Unit 4. These Introduction/Overview/Summary sections provide focus, clarity, vocabulary, definitions, and examples for the "big mathematical ideas and understandings" critical to 1st Grade. This information will support your professional decision-making within the Sessions and Modules as needed.

Unit 4
**Leapfrogs on the
 Number Line**

20 sessions over 20 days

A/D/E: 1 day

NVACS Focus Domains:
 NBT-OA-MD

Total Days: ~21

<p>Mathematical Background: Read Bridges Unit 4 Overview pages (pp. i-vi)</p>	<p>Essential Questions for teacher consideration: How will I extend students' understandings of reasoning skills and the structure of our number system in order to explore addition and subtraction and determine unknown values? How will I support students' connections to what they know, and their transition from reasoning with numbers and structure to reasoning with length measurement, comparison, and order?</p>
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[1st Grade Curriculum Pacing Framework: Balanced Calendar](#)

Instructional note:

"If you learn something deeply, the synaptic activity will create lasting connections in your brain, forming structural pathways, but if you visit an idea only once or in a superficial way, the synaptic connections can "wash away" like pathways made in the sand." (Boaler, 2016, p. 1)

Unit 4 extends students' understanding and use of structure for problem solving rather than counting for problem solving. The number line provides a model of our number system and a model for beginning operations with addition and subtraction from 0-120. Strategies include skip jumping in multiples of 5 and 10 with 5s and 10s as landmark numbers, moving forward and backward, using numbers both on and off the decade, and finding differences between two numbers. The number line helps students visualize number relationships and use these visualizations to count and calculate. This work supports greater flexibility in mental arithmetic. The open number line is a very beneficial tool both visually and conceptually as students bring meaning to it and act upon it in a variety of ways. Problem contexts are critical as they determines the model or strategy to consider.

Students are able to develop understanding of compare problem situations, representing and solving for unknowns in any location for all problem types, and solving addition and subtraction problems within 20. They come to see addition as "a process of increasing or putting together" and subtraction as "taking away or finding the difference". Fluency development in this unit continues to build into larger numbers (up to 120) by applying reasoning strategies developed in previous units. Students use the number line to explore counting by 1s, 5s, and 10s. Just as in *Unit 3, Numbers Base Ten and Operations and Algebraic Thinking Standards* are worked on simultaneously throughout this unit building place value understanding and deepening students' understanding of number relationships (part/whole). Students also write inequality statements.

Unit 4 also addresses the critical measurement standards. The *Progressions for the Common Core State Standards in Mathematics - K-5, Progression on Geometric Measurement* states on p.2, "Geometric measurement connects the two most critical domains of early mathematics, geometry and number, with each providing conceptual support to the other." *Module 4* extends students' understanding of the structure of the number line by turning it vertically to apply to the continuous attribute of length measurement. Students continue to explore comparison problem types using measurement as the number context and use reasoning strategies of counting up and down, by 1s, 5s, and 10s. Attend to *Unit 4 Introduction* (pp. ii-iii) for clarification of the open number line and how it supports skip-counting reasoning (pp. ii-iv).

Transitivity becomes a focus for 1st grade using length measurement, comparison, and ordering. Students continue use of direct comparison, but they also "...should be able to use indirect comparison and explanations that draw on transitivity (MP3)...If A is longer than B and B is longer than C, then A must be longer than C as well." (The Progressions for the Common Core State Standards in Mathematics - K-5, Progression on Geometric Measurement p.8). This also transfers to number comparison, ordering, and reasoning. Students may benefit from additional learning opportunities in the *Measurement and Data* cluster, specifically in "ordering three objects by length; compare the lengths of two objects indirectly by using a third object" (NVACS, 2010, 1.MD.1).

Your child watching may indicate you have a wide range of student levels of sophistication represented in your class at this time. According to Battista (2012), "...the more students describe their thinking, the better they will become at explaining that thinking, especially if you guide them toward providing increasingly accurate and detailed descriptions of their reasoning" (p. xiii). Utilize questioning techniques to push for student descriptions that will help you understanding student strategies and reasoning. If they say, "I counted," you might return with, "How did you count?" "Can you show me?" "Tell me more."

More connections between *Number Corner* and the sessions will start to become evident. Up to this point, the two components may have felt isolated from each other; however, teachers have the opportunity to use one as a launching point for creating common experiences and common schema for the other. This creates a strong foundation for future lessons. In *Unit 4* sessions, Tad and Polli, the frog characters from the September *Number Corner* return. Additionally, in *Number Corner* students have had opportunity to engage successfully with the open number line, moving forward and backward on the number line and using it as a model for computation.

On-going enrichment:

Continue noting the *Skills Across the Grade Level* chart in the Introduction section (Unit 4 pp. iv-v). 1.OA.5 is the only standard to be secure by the end of this *Unit*. All other standards continue to be introduced or developed. This is important information for those day-to-day professional instructional decisions you have to make within each session as to what discussions or activities to extend or cut short or emphasize or skip or, etc. Expect all students to engage in the math.

Continue to consider “Support” and “Challenge” options within each *Session*, and “Game Variations”, “Differentiate”, and “English-Language Learners” ideas in *Work Places*.

Essential Academic Vocabulary Use these words consistently during instruction.		
New Academic Vocabulary: <small>(first time explicitly taught) *indicates Word Resource Cards are available in the Bridges materials</small>	Review Academic Vocabulary: <small>(Vocabulary from Number Corner or previous units)</small>	
Data*	Add*	Less than*
Inch*	Addition	Long/Longer/Longest*
Information	Compare*	Multiple
Measure	Decade	Number line*
More than	Difference*	Scale
Open number line*	Double	Short/Shorter/Shortest*
	Equal*	Subtract*
	Equation*	Subtraction
	Graph	Sum or Total*
	Half*	Tens*
	Height*	Taller than

Additional terminology that students may need support with: strategies, minus, plus, predict, prediction, skip-jump problem

***Collaborative Team Conversations (CTC)**

Consider using **one** of the following as part of the formative assessment process at the lesson level to **collect student work** to analyze for **evidence of mathematical understanding**:

- Guiding question:**
- “What strategies are students using to solve addition and subtraction problem to 10 using the number line?”
 - “What evidence do student demonstrate to show mental manipulation of combinations with 10?”
 - “If needed, what intensification interactions will support the understanding and use of a variety of tools and strategies to solve for combinations to 10?”

Lesson	Evidence	Look for
U4M2S5 Numbers on a Line Checkpoint #3 & 4 TG pp. 23-25	Numbers on a Line Checkpoint #3 & 4 observation of student record sheet (TG U4M2S5 p. T5) Numbers on a Line Checkpoint Scoring Guide #3 & 4 (AG Bridges Unit Assessments pp. 38-39)	Focus CTC around conceptual understandings of the big idea and strategies used: <ul style="list-style-type: none"> adding combinations within 10 on the number line (counting on) with flexibility, accuracy, efficiency and appropriateness subtracting combinations within 10 on the number line (counting back) with flexibility, accuracy, efficiency and appropriateness visualizing the number structure visualizing and using quantities and number combinations
U4M3S5 Unit 4 Assessment #4 & 5 TG pp.25-28	Unit 4 Assessment #4 & 5 observation and student record sheet (TG U4M3S5 p. T18) Unit 4 Assessment Scoring Guide #4 & 5 (AG Bridges Unit Assessments pp. 41, 43-44)	Focus CTC around conceptual understandings of the big idea and strategies used: <ul style="list-style-type: none"> adding combinations within 10 on the number line (counting on) with flexibility, accuracy, efficiency and appropriateness subtracting combinations within 10 on the number line (counting back) with flexibility, accuracy, efficiency and appropriateness visualizing and using number structure (the number line) visualizing and using quantities and number combinations

Learning Cycle Assessments (summative)	Number Corner Checkup 1 #1, 2, 3 NC TG Vol. 1 October Assessment pp. 49-51, T10; AG Number Corner Assessments pp. 11, 14	Use <i>Number Corner Checkup 1 Scoring Guide</i> AG Number Corner Assessments p. 14
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Standards listed in **bold** indicate a focus of the lesson.

NVACS (Content and Practices)	Mathematical Development of the Big Idea	Instructional Clarifications & Considerations
Module 1- Session 1: The Life-Sized Number Line		
<p>1.NBT.1</p> <p>MP.2 MP.4</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. Kindergarten students worked with the count sequence and comparing numbers. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding the number structure exploring addition and subtraction using the relationship between addition and subtraction <p>Securing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> counting on counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> Where does a number line start? <p>Instructional Notes:</p> <ul style="list-style-type: none"> The number line is a critical tool in 1st grade for understanding and visualization of number structure. Consider creating a more permanent option for a number line by affixing a retractable clothesline to a location at child's eye level. Tips and ideas are provided on the Bridges Educator Site. The digital tool for the number line may be useful throughout this unit. Found here. Read the About This Session in the margin (p. 4). As students are coming to understand the structure of our number system, resist the urge to provide too much support (for example, calling them up by numerical order) instead of letting them discover and problem solve. Watch for students' thinking that zero has to be all the way to the left on the line, that the amount of space between numbers must be exactly equal, and that cards cannot be moved to change the scale. Discuss the term "scale" to help children understand that the amount of space needed between numbers can change based on the two endpoints (or the measure). Consider purposely placing the cards in the wrong order on the number line to extend students problem solving. <p>Enrichment:</p> <ul style="list-style-type: none"> See Step 9 (p. 6). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students struggling with counting, identifying numerals, or determining the order and cardinality of numbers. Provide intensification work with a range of numbers appropriate to their instructional level.
Module 1- Session 2: What's in the Box?		
<p>1.OA.6 1.OA.8</p> <p>MP.2 MP.4</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. Kindergarten students worked with the count sequence and comparing numbers. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding the number structure understanding part/whole relationships solving for an unknown 	<p>Guiding Questions:</p> <ul style="list-style-type: none"> What do you know about numbers? How can a number line help you determine missing numbers? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Read the <i>About This Session</i> in the margin (p. 8). Students may struggle with the concept of finding a number "in the middle" if the number line does not start at zero. For example: if a number line shows 10 and 20 with a box in the middle, students must understand that "half" or "in the middle" is not based on the 20 alone, but on the midway point between the two identified numbers. This misconception can be a great classroom discussion. <p>Enrichment:</p> <ul style="list-style-type: none"> See Step 7 (p. 11). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students struggling with counting, identifying numerals, or determining the order and cardinality of numbers. Provide appropriate numbers for intensification work. Identify students having trouble justifying their reasoning and provide extra support.

Module 1- Session 3: Hopping Along the Number Line to Ten		
<p>1.OA.1 1.OA.5 1.OA.6</p> <p>MP.2 MP.4</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. Kindergarten students worked with the count sequence and comparing numbers with both discreet and interval counting. Connect to previous sessions' number line work. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding the number structure exploring addition and subtraction using the relationship between addition and subtraction <p>Securing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> counting on counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What different things can you do on our number line math tool? <p>Instructional Notes:</p> <ul style="list-style-type: none"> A misconception on the number line might be counting the lines (ticks) or numbers rather than counting the spaces or intervals between the ticks. Confirm understanding of the difference between interval counting and discreet counting of objects. For students who struggle to understand interval counting, consider having them actually hop along a life size number line. <p>Enrichment:</p> <ul style="list-style-type: none"> Consider challenging some students by increasing the number quantities in the stories and adjusting the number line accordingly. <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students who mistakenly count the starting number instead of the first hop, which will result in the answer being off by one number.
Module 1- Session 4: Introducing Work Place 4A The Frog Jump Game		
<p>1.OA.1 1.OA.5 1.OA.6</p> <p>MP.2 MP.4</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. Kindergarten students worked with the count sequence and comparing numbers with both discreet and interval counting. Connect to previous sessions' number line work. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> using the relationship between addition and subtraction comparing quantities counting all <p>Securing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> counting on counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What math stories can you show on a number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Online digital tools with the add and subtract spinner and cards are available on the <i>Bridges Educator</i> site. See the <i>Work Place Sentence Frames</i> for Unit 4 here. Arranging the cards to model a subtraction equation is an important part of this session. Consider focusing the conversation around what makes sense. After students have acted out problems concretely on the life size number line, consider moving into the representational phase by drawing a number line on the board and having students model thinking on it. <p>Enrichment:</p> <ul style="list-style-type: none"> See the <i>Game Variations on Work Place Instructions</i> (p. T4). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify which students are counting by 1s and which students are counting on. You will want this information for tomorrow's lesson. Identify students being confused about directions on the number line for addition and subtraction. Identify students struggling to identify a story with an addition or subtraction operation. Use <i>Work Place Guide</i> for suggestions to support (p. T2).
Module 1- Session 5: Add & Subtract on the Number Line		
<p>1.OA.5 1.OA.6</p> <p>MP.4 MP.5</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. Kindergarten students worked with the count sequence and comparing numbers with both discreet and interval counting. Connect to previous sessions number line work. 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What different ways can you solve problems on a number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Read the <i>Math Practices in Action</i> in the margin (p. 22). Observe students using the strategies of counting-by-1s and counting-on. Have one students share a counting all strategy, and name the strategy. Then strategically choose another student to share the counting-on strategy, and name that strategy. Discuss with students which is more efficient and why. Pay close attention to the recommendation in Step 9 (pp. 23-24).

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	<p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • using relationship between addition and subtraction • comparing quantities • using combinations to 10 <p>Securing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • counting on • counting back 	<p>Enrichment:</p> <ul style="list-style-type: none"> • Ask students to try more than one strategy on each problem. <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify and document which strategies students are using (for example - counting all, counting on, and counting back).
Module 2- Session 1: The Number Line to 120		
<p>1.NBT.1 1.NBT.5 1.MP.2 1.MP.8</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. • Connect to previous sessions number line work to 10, and then to 20. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number relationships to 120 • understanding the count sequence to 120 • determining an unknown number • using multiples of 5 and 10 	<p>Guiding Questions:</p> <ul style="list-style-type: none"> • What patterns do you see on the number line? • How can you use the patterns to identify different numbers on the number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • Read the <i>About This Session</i> in the margin (p. 4). • Highlight the relationship between 5 and 50 and 10 and 100 and their placement on the number line. • As stated in the K-5 Progression on Number and Operations in Base Ten, “The number words continue to require attention at first grade because of their irregularities. The decade words “twenty, thirty, forty” must be understood as indicating 2 tens, 3 tens etc. Many decade number words sound much like teen number words. For example, “fourteen” and “forty” sound very similar” (pp. 6-7). • When providing opportunities for students to find the “half way point” students need many opportunities to experience using the anchor of 5 (for example: halfway between 20 and 30 which would be 25). <p>Enrichment:</p> <ul style="list-style-type: none"> • See Step 6 (p. 6). <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students struggling with these scenarios with higher numbers. Provide experiences with instructionally appropriate number quantities if need be, and then make the explicit connection and relationship between 5 and 50 etc.
Module 2- Session 2: Find the Value		
<p>1.NBT.1 1.NBT.5 1.MP.2 1.MP.8</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Kindergarten students utilized the closed and open number line in both <i>Number Corner</i> and <i>Problems and Investigations</i>. • Connect to previous sessions’ number line work to 10, and then to 20. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number relationships to 120 • understanding number count sequence to 120 • determining an unknown number 	<p>Guiding Question:</p> <ul style="list-style-type: none"> • How does the placement of a card on the number line determine the value of the card? <p>Enrichment:</p> <ul style="list-style-type: none"> • See <i>Support</i> and <i>Challenge</i> in Step 6 (p. 11). <p>Child Watching:</p> <ul style="list-style-type: none"> • For students who may be struggling with these scenarios, encourage use of tools to support their understandings.
Module 2- Session 3: Hopping Along the Number Line to One Hundred		
<p>1.NBT.1 1.NBT.4 1.NBT.6 1.MP.7 1.MP.8</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Connect to previous sessions’ number line work to 10, and then to 20. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number relationships to 120 • making sense of story problems 	<p>Guiding Question:</p> <ul style="list-style-type: none"> • Do you always count the same way (by 1s) when hopping on the number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • Read the <i>Math Practices in Action</i> in the margin (p. 16). • Make the explicit connection and relationship between 5 and 50 etc. <p>Enrichment:</p> <ul style="list-style-type: none"> • Extend number quantities past 120. • Have students record the equations. <p style="text-align: right;"><i>-continues on next page-</i></p>

	<ul style="list-style-type: none"> counting forward and backward adding and subtracting with multiples of 10 recording equations 	<p>Child Watching:</p> <ul style="list-style-type: none"> Identify students struggling with counting by tens, or struggling to determine which direction to move on the number line. Have students act out the problem if needed. Watch for the misconception of counting the first number (discreet vs. interval counting).
Module 2 Session 4: Introducing Work Place 4B Super Frogs		
<p>1.NBT.1 1.NBT.2c 1.NBT.4 1.NBT.6</p> <p>1.MP.2 1.MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to previous sessions' number line work to 10, and then to 20. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding number relationships to 120 counting forward and backward by multiples of 10 writing addition and subtraction expressions 	<p>Guiding Question:</p> <ul style="list-style-type: none"> How can you compare expressions on a number line? <p>Instructional Note:</p> <ul style="list-style-type: none"> See the digital tools for this <i>Work Place</i> on the Bridges Educator Site. <p>Enrichment:</p> <ul style="list-style-type: none"> <i>Work Place Game Variations</i> (p. T3). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students struggling with counting by 10s, or struggling to determine which direction to move on the number line. Have students act out the problem if needed. Watch for the misconception of counting the first number (discreet vs. interval counting).
Module 2- Session 5: Add & Subtract on the Number Line to One Hundred		
<p>1.NBT.2c 1.NBT.4 1.NBT.6</p> <p>MP.2 MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to previous sessions' number line work to 10, and then to 20. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding number relationships to 120 adding and subtracting by 10s counting on counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> How do you show your thinking on a number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> See the online Digital Display materials on the Bridges Educator Site. All student work pages are also available on this site. The <i>Assessment Binder</i> under the <i>Bridges Unit Assessment</i> tab provides the scoring guide for this checkpoint (p. 39). <p>Child Watching:</p> <ul style="list-style-type: none"> Use the scoring guide for assessing students and informing your instruction. Watch for students struggling to count forward and particularly backward by 1s.
Module 3- Session 1: Lily Pads		
<p>1.NBT.1 1.NBT.2c 1.NBT.5</p> <p>MP.2 MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to previous sessions of number line work focusing on number system structure. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding the number structure - decades comparing "how many more" counting on counting back 	<p>Guiding Questions:</p> <ul style="list-style-type: none"> How does the structure of the number line help you to solve problems? How do you move on the number line to show addition and subtraction? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Several of the recommended questions suggest counting how many leaps. Ensure that when students are communicating about the number of leaps in this scenario, each leap represents 10, not 1. Pair the language "three leaps" with "3 leaps equal 30 inches" continuously. Note that although the term "inches" is used here to represent the amount of space between each lily pad, inches as a unit of measure are not a first grade, but 2nd grade, standard. Focus on the intended mathematical understanding of counting forwards and backward by 10s, and using the inches for creating a setting for the story line. See the digital tools for <i>Frog Path 4C Work Place</i> on the Educator Site. <p>Enrichment:</p> <ul style="list-style-type: none"> See the <i>Work Place Game Variations</i> (p. T9). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students struggling to determine whether they move forward or backward on the number line. Identify students struggling with counting by 10s. Watch for the misconception of counting the first number (discreet vs. interval counting).
Module 3- Session 2: Chase the Fly		
<p>1.NBT.1 1.NBT.2c 1.NBT.3 1.NBT.5</p> <p>MP.2 MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to previous sessions of number line work focusing on number system structure. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> understanding number structure to 100 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What do you already know about skip counting using 5s or 10s? <p>Instructional Notes:</p> <ul style="list-style-type: none"> You can use the digital number line rather than drawing your own. Use the tools on the bottom of the number line to change the count to 5s. You can also adjust the spacing of the number ticks as well. Read the <i>Math Practices in Action</i> in the margin (p. 11). Utilize accountable talk and classroom discourse throughout the discussions. <p style="text-align: right;"><i>-continues on next page-</i></p>

	<ul style="list-style-type: none"> • counting by 5s and 10s • comparing “how many more” • counting up • counting back 	<ul style="list-style-type: none"> • Step 3 asks you to have students come up and place their number card on the line. The power of this task comes from random ordering. Refrain from the “who has 0? Who has 5? Who has 10?” method of placement. Instead, use the phrasing, “Johnny says he has 10. Where on the line do you think it should be placed?” <p>Enrichment:</p> <ul style="list-style-type: none"> • See Step 13 (p. 13). <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students struggling to determine 10 less or 10 more. • Students may struggle connecting the chart to the number line. Have a child point to the chart simultaneously while another points to the number line.
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Module 3- Session 3: Frog Races

<p>1.OA.5 1.NBT.4 1.NBT.5</p> <p>MP.7 MP.8</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Connect to previous sessions of number line work focusing on number system structure. • The previous sessions focused on counting forward and backward by 5 & 10 consistently on a decade number. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number structure to 100 • counting by 1s, 5s, and 10s on and off the decade • counting up • counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> • How does skip counting change when you start at various numbers? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • Read the <i>Math Practices in Action</i> in the margin (p. 16). • This lesson addresses counting by 10s off the decade (34, 44, 54). • See this game from the Bridges Educator site to support counting by groups. • You can use the digital number line rather than drawing your own. Use the tools on the bottom of the number line to change the count to 10s. • Provide students many opportunities to work with closed and open number lines to develop understanding of counting off the decades. The number line provides support for a stronger mathematical trajectory as opposed to the hundreds grid. The linear model of the number line provides students the opportunity to use the model flexibly to support thinking strategies. A hundreds grid can actually limit strategies, and create a more “procedures” based approach by “just moving down one.” This can prevent students from developing flexible understanding of the relationships between numbers. <p>Enrichment:</p> <ul style="list-style-type: none"> • Extend the counting sequence beyond 120. <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students struggling to determine 10 less or 10 more on and off the decade.
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Module 3- Session 4: Hit the Pad

<p>1.NBT.4 1.NBT.5 1.NBT.6</p> <p>MP.2 MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Connect to previous sessions of number line work focusing on number system structure. • Previous sessions focused on counting forward and backward by 5 & 10 consistently on a decade number. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number structure to 100 • counting by 1s, 5s, and 10s on and off the decade • counting up • counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> • Does skip counting change when you go forward or backward? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • See the online Digital Display materials https://bridges.mathlearningcenter.org/digital-materials/session-4-hit-pad • Read the <i>About This Session</i> in the margin (p. 22). <p>Enrichment:</p> <ul style="list-style-type: none"> • This game is very challenging and students may need multiple times playing it with the teacher. <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students struggling with determining 10 less or 10 more on and off the decade. • Identify students struggling to determine whether they move forward or backward on the number line. • Identify students struggling with counting by 10s. • Identify students counting the numbers rather than the spaces resulting in an inaccurate answer.
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Module 3- Session 5: Unit 4 Assessment

<p>1.NBT.4 1.NBT.5 1.NBT.6</p> <p>MP.2 MP.7</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Connect to previous sessions of number line work focusing on number system structure. • Previous sessions focused on counting forward and backward by 1s, 5s, & 10 consistently on and off the decade. 	<p>Instructional Notes:</p> <ul style="list-style-type: none"> • The <i>Assessment Guide</i> under the <i>Bridges Unit Assessments</i> tab provides the scoring guide for the <i>Unit 4 Assessment</i> (p. 43). • See the digital tools for this <i>Work Place</i> on the Educator Site.
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	<p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding number structure to 100 • counting by 1s, 5s, and 10s on and off the decade • counting up • counting back 	<p>Child Watching:</p> <ul style="list-style-type: none"> • Provide extra support for students struggling with one or more of the following (see <i>Assessment Binder, Bridges Unit Assessment</i> tab, p. 35 for more information): counting to 100 by 10s; counting backward from various numbers between 1-100; counting to 120 starting from any number less than 120; counting on and counting back to solve addition and subtraction combinations to 20; understanding that 10 can be thought of as a bundle of 10 ones; and understanding that the numbers from 11 to 19 are composed of a ten and 1-9 ones.
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Module 4- Session 1: Going to Antarctica

<p>1.NBT.1 1.NBT.3 1.MD.2 1.MD.4 MP.5 MP.6</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Kindergarten students worked with describing and comparing measurable attributes of objects such as length and weight. • Kindergarten students also directly compared two objects with a measurable attribute in common to see which object had "more of"/"less of" the attribute and described the difference. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • understanding the relationships between numbers • ordering numbers • measuring height 	<p>Guiding Questions:</p> <ul style="list-style-type: none"> • What do you notice about a measuring strip? • How is it similar to a number line? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • Inches and feet are part of the story context for this session. The focus, however, is using the number lines vertically as a measuring tool. • It is valuable to provide the time for students to construct their own measuring strips. The act of constructing this tool will aide in the development of understanding about measuring tools, how they work, and how iterated unit lengths are connected together. It also presents opportunities to observe for misconceptions around measurement. Some common misconceptions include leaving gaps between units, overlapping units, and using units that are not of equal size. Students learn the importance of attending to precision through experience. If a student's constructed measuring strip has many overlaps in the gluing, allow this to be discovered by having two students measure the same student using their two different tools. When they arrive at different answers, they can question why that might be. • Consider making a measuring strip (prior either to the session or by cutting and putting together with class input) that can be taped to a wall area and used as a common measure for all students. This class measuring can be done while students are building their own measuring strips. • A blog titled A Penguin Proposal provided on the Educator Site contains ideas to enrich this module. <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students who leave gaps, glue with overlaps, or cut off too much paper creating a shorter length of unit when they are creating their measuring strips. • Identify students who do not make the connection between their string and their measuring strip.
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Module 4- Session 2: Rockhopper Penguins

<p>1.NBT.1 1.NBT.2c 1.NBT.3 1.NBT.4 1.NBT.6 1.MD.2 MP.5 MP.6</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> • Kindergarten students worked with describing and comparing measurable attributes of objects such as length and weight. • Kindergarten students also directly compared two objects with a measurable attribute in common to see which object had "more of"/"less of" the attribute and described the difference. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> • measuring height • comparing measurements (greater than and less than) 	<p>Guiding Question:</p> <ul style="list-style-type: none"> • How does gathering and organizing information help you? <p>Instructional Notes:</p> <ul style="list-style-type: none"> • Use the students' strings from the previous session to create the "Rockhopper" string length. • Utilize the instructional note for the previous session. • The Rockhopper Penguin poem can also be found on the Educator Site. • The act of creating a length of string to compare measurement length is an action that supports the idea of transitivity, which is developed throughout the year. (See K-6 Progression on Measurement and Data (Measurement Part, p. 3)). • The use of strings allows students to understand length as a straight line between two points. This addresses misconception of measuring around an object, which results in an inaccurate length measurement. • Consider making a life-sized cutout of the penguin for this session (and all the penguins in the following sessions also) from black butcher paper. This give the students a visual representation for the height of the penguin if needed. <p>Enrichment:</p> <ul style="list-style-type: none"> • Students can explore measuring other objects. <p>Child Watching:</p> <ul style="list-style-type: none"> • Identify students not keeping the length of string straight and students not lining the beginning of their string up with the beginning of their measuring tool. These actions lead to inaccurate measurements and measurement misconceptions. Highlight the misconception by having two students compare their length of strings and discover they are not the same and revisit their measuring strategies to flesh out the misconception.
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Module 4- Session 3: King Penguins		
<p>1.OA.8 1.NBT.1 1.NBT.2c 1.NBT.3 1.NBT.4 1.NBT.6 1.MD.2</p> <p>MP.5 MP.6</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to understanding developed in the previous sessions. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> measuring height comparing measurements (greater than and less than) 	<p>Guiding Question:</p> <ul style="list-style-type: none"> How does gathering and organizing information help you? <p>Instructional Note:</p> <ul style="list-style-type: none"> See Session 1 and Session 2 Instructional Notes. <p>Enrichment:</p> <ul style="list-style-type: none"> See Step 5 in the lesson (p. 16). <p>Child Watching:</p> <ul style="list-style-type: none"> Identify students not keeping the length of string straight and students not lining the beginning of their string up with the beginning of their measuring tool. These actions lead to inaccurate measurements and measurement misconceptions. Highlight the misconception by having two students compare their length of strings and discover they are not the same and revisit their measuring strategies to flesh out the misconception.
Module 4- Session 4: Comparing Rockhopper & King Penguins		
<p>1.OA.1 1.OA.8 1.NBT.1 1.NBT.2c 1.NBT.3 1.NBT.4 1.MD.2</p> <p>MP.1 MP.5</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to understanding developed in the previous sessions. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> determining difference understanding part/whole relationships counting up counting back 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What can you find out by comparing measurements? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Comparison and difference unknown problems are some of the most difficult problem types 1st graders will encounter. See page 88 in the NVACS for this chart. See Step 4 for suggestions if students struggle with understanding what the problem is asking (p. 21). Encourage students to access multiple tools, such as unifix cubes and number lines, to support their thinking and reasoning. Some students will want to construct 18 and 36, match up the towers, snap off the difference and count them. If students using cubes attempt to match their measurement with the measuring strip they will find that the cubes are not each an inch in length, resulting in 18 cubes being less than 18 inches. Various strategies may be used: counting up by 1s from 18 to 36, counting by 1s to 20 then hopping from 20 to 30, counting by 10s from 18 to 28 then by 1s from 28 to 36, counting off the decade (18, 28, 38) then hopping back 2 to compensate. Resist associating counting by 1s as a negative strategy, as it remains an appropriate strategy when numbers are close together (ex: 18 to 20). Engage in conversations about when it is an efficient and appropriate strategy. Consider permanently posting the penguins' strings next to the labeled measuring strip. This will support students who need a concrete model, allowing them to connect the concrete string to the abstract label on the measuring strip, and support further direct comparisons. <p>Enrichment:</p> <ul style="list-style-type: none"> See Step 8 (p. 22). <p>Child Watching:</p> <ul style="list-style-type: none"> Students still counting by 1s should be encouraged to move to a more efficient strategy. During student sharing, strategically order student justifications from the lowest sophistication to the highest sophistication in order to highlight this progression. This give all students an entry point into the problem solving and challenges all students to try a different strategy than they are using.
Module 4- Session 5: Me & the Penguins		
<p>1.OA.1 1.OA.8 1.NBT.1 1.NBT.3 1.NBT.4 1.MD.1 1.MD.2</p> <p>MP.1 MP.5</p>	<p>Access Prior Learning:</p> <ul style="list-style-type: none"> Connect to understanding developed in the previous sessions. <p>Developing the Big Idea and key Strategic Behaviors:</p> <ul style="list-style-type: none"> determining difference understanding part/whole relationships counting up counting back ordering three numbers writing inequality statements 	<p>Guiding Question:</p> <ul style="list-style-type: none"> What do you find out when you compare three different things? <p>Instructional Notes:</p> <ul style="list-style-type: none"> Read the <i>About This Session</i> in the margin (p. 26). Seriation, ordering a set on objects by length (MD.1), is explored in this lesson. "Such sequencing requires multiple comparisons. Initially, students find it difficult to seriate a large set of objects that differ only slightly in length" (K-6 Progression on Measurement and Data (Measurement Part, p. 6)). Transitivity (if \underline{a} is longer than \underline{b}, and \underline{b} is longer than \underline{c}, then \underline{a} must be longer than \underline{c} also) is a big idea for students in 1st grade and may require class discussion for understanding.

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		<p>Enrichment:</p> <ul style="list-style-type: none"> • See Step 2 (p. 26). • See Step 10 (p. 28). • Transition routines offer opportunities for providing students with continuous experiences comparing heights (for example, excusing students to line up based on how their height compares to a chosen student's height). <p>Child Watching:</p> <ul style="list-style-type: none"> • Continue to observe student strategies for comparing lengths as noted in the previous session.
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