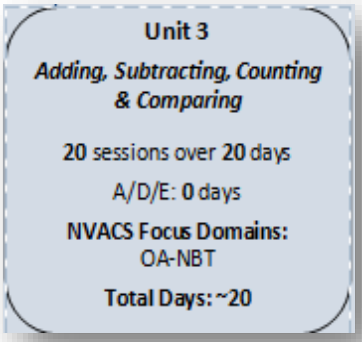
First Grade Unit 3: Adding, Subtracting, Counting & Comparing



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)

Read the Bridges Unit Overview/Introduction for Unit 3 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 3. 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.

Mathematical Background: Read Bridges Unit 3 Overview pages (pp. i-viii)	Essential Question for teacher consideration: How will I support students' development of fluency of key number facts within 10, and deepen understanding of relationships between numbers so students will be able to use flexibly a variety of strategies in their problem solving within 20?

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)

Van de Walle et al., (2014) quotes Howden (1989) describing *number sense* as a "good intuition about numbers and their relationships. It develops gradually as a result of exploring numbers, visualizing them in a variety of contexts, and relating them in ways that are not limited by traditional algorithms" (p. 11). This unit's big mathematical idea focuses on the 2nd phase of fluency development and supports the development of reasoning strategies to help students work towards security of key number facts up to 10, and begin to form number understanding of number relationships to 20. Students will be able to "see" subsets of numbers within larger numbers (hierarchical inclusion), and deepen conceptual understanding of part/whole reasoning.

The *Nevada Academic Content Standards (NVACS)* describe procedural fluency as the ability to apply procedures flexibly, accurately, efficiently, and appropriately; to transfer reasoning strategies to different problems and contexts; to build or modify procedures from other procedures; and to recognize when one strategy or procedure is more appropriate than another (2010, p. 6). Developing this flexibility and deep understanding of relationships between numbers, students are more likely to have accurate and flexible recall of all single-digit number facts. The expectation for Phase II fluency is using a strategy to determine a solution for a problem within about 3 seconds, not "just memorizing the facts" and being able to recall them instantly. Research indicates that teaching "drill and kill" procedures implemented with speed and accuracy is not successful for fact fluency for most children. "For some people, learning mathematics as procedures has been successful; but for the majority of our nation, knowledge of mathematical rules has not allowed them to use math confidently in their daily lives" (Parrish, 2010, p. 4). This also causes math anxiety, as discussed in the research introduced in *Unit 2* (Boaler, 2016).

Students' ability to visualize the relationship of the numbers within various interactions is key. Intentional support and child watching for the development of flexible relational understanding of number is the intention in *Unit 3* and of *Mathematical Practices 7* and *8* (NVACS, 2010, p. 8). Continue use of the instructional materials to engage students in authentic conversations around solving meaningful problems in real world contexts. Also, use the manipulatives and the *Work Place* games as support for students to visualize, work out, demonstrate, explain, and practice their understanding of the relationships and the connections within the mathematics as they move toward fluency within 10.

Unit 3 develops students' understanding of the commutative property (numbers can be added in any order) which has been explored in kindergarten. Eventually this understanding will extend to, "Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20" (NVACS, 2010, 1.OA.2). As students develop reasoning strategies, the power of the property becomes more evident when they are faced with 3 addends. Students also find that rearranging the 3 addends (applying the associative property), lends itself to making anchors of 5 or 10. Keep this trajectory of learning in the forefront of your mind to capitalize on opportunities to support this student understanding. Several lessons throughout this unit will have suggestions to extend this work.

Discussions with students and with the class are powerful tools to support and drive students' mathematical development. Support a culture where students are listening to each other and sharing-and-comparing their thinking and their work as opposed to just showing their work and then moving on. "Mathematical discourse includes the purposeful exchange of ideas through classroom discussion, as well as through other forms of verbal, visual and written communication" (NCTM, 2014, p. 29).

Unit 3 also reinforces and extends important place value understandings introduced in kindergarten as ten ones and some more ones. As stated in the Progression Documents, "In first grade, students learn to view ten ones as a unit called a ten. The ability to compose and decompose this unit flexibly and to view the numbers 11 to 19 as composed of one ten and some ones allows development of efficient, general base-ten methods for addition and subtraction. Students see a two-digit numeral as representing some tens and they add and subtract using this understanding." (K-5 Progression on Number and Operations in Base Ten, p. 6). Students will struggle with addition of two 2-digit numbers if unitizing understanding of 10 is not secure.

This unit's child-watching opportunities provide space to observe for students' secure understanding and identify those who are struggling with the kindergarten standard K.NBT.1 in order to provide intervention as necessary. The Standard load of this unit may feel heavy, however, as Van de Walle, Karp, Lovin, & Bay-Williams state, "There is no need to separate place-value instruction from computation instruction. Children's efforts with the invention of their own computation strategies will both enhance their understanding of place value and provide a firm foundation for flexible methods of computation." (2014, p.176).

On-going enrichment:
Continue noting the *Skills Across the Grade Level* chart in the *Introduction* section (*Unit 3* pp. iv-v). All 1.OA and most 1.NBT Standard are still being developed throughout this unit. The details of this chart are important for day-to-day professional instructional decisions made within each session as to what discussions or activities to extend or cut short or emphasize or skip or, etc.

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

Expect all students to engage in the math. For specific help or ideas for any unit *Module* or *Number Corner* routine the best place to look first is on the *Educator Site* under the *Resources* tab. Click on the numbers to the right of any particular *Module* or *Number Corner* month and it will give you specific supports and answers to many questions: https://bridges.mathlearningcenter.org/user.

Key Questions for *Number Corner* routines are a great resource for going deeper into the mathematical content through discussion! They are on this link under the *Resources* tab – *Number Corner* – November (or any desired month): https://bridges.mathlearningcenter.org/user.

Consistent motor strokes, gestures and using words and actions together support student understanding (E.g. for 5 - sweep under and across, for 10 - circle around).

Essential Academic Vocabulary Use these words consistently during instruction.	
New Academic Vocabulary: (first time explicitly taught) *indicates Word Resource Cards are available in the Bridges materials	Review Academic Vocabulary: (Vocabulary from Number Corner or previous units)
(No new vocabulary for Unit 3)	*Add** *Addition* *Compare** *Difference** *Double* *Equal** *Equation** *Even* *Graph* *Greater than** *Half** *Less than** *Odd* *Ones** *Subtract** *Subtraction* *Sum or Total** *Tens*

Additional terminology that students may need support with: strategies, minus, plus, combinations, problem solving

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 questions:
"What strategies are students using to solve addition and subtraction problems with combinations of 10?"
"How are students developing fluency with addition and subtraction combinations for 10 (flexibility, accuracy, efficiency and appropriateness)?"
"How are students seeing and understanding 10 and some more?"
"What interactions will support intensification for understanding of composing combinations to 10 if needed?"

Lesson	Evidence	Look for
U3M2S4 *Combinations of Ten Checkpoint* TG pp.20-21	*Combinations of Ten Checkpoint* observation and student record page (TG U3M2S4 p. T4) *Combinations of Ten Checkpoint Scoring Guide* (AG Bridges Unit Assessments pp.28-29)	Focus CTC around conceptual understandings of the big idea and strategies used: • adding combinations within 10 with flexibility, accuracy, efficiency and appropriateness • subtracting combinations within 10 with flexibility, accuracy, efficiency and appropriateness • using strategic behaviors (counting on, counting back, using known numbers or facts, recalling quickly) • identifying and using needed tools
U3M3S4 *Work Place 3F Fifty or Bust!* Observation TG pp.19-22, T3-T4	*Fifty or Bust! Record Sheet* observation and student record sheet (TG U3M3S4 p. T6)	Focus CTC around conceptual understandings of the big idea and strategies used: • grouping and counting objects by 10s and 1s • understanding that a 10 can be thought of as a new unit of 10 ones • understanding that numbers from 11-19 are composed of a 10 and some more 1s • coloring in cubes one by one, or an entire ten-train, or coloring in ones by using known combinations to make 10

Learning Cycle Assessments (summative)	*Unit 3 Assessment* - U3M3S5 TG pp. 23-26, T7-T8; AG Bridges Unit Assessments pp. 30-31	Use *Unit 3 Assessment Scoring Guide* AG Bridges Unit Assessment p. 32

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: Introducing Work Place 3A Drop the Beans		
1.OA.3 1.OA.6 1.OA.8 1.MD.4 MP.4 MP.7	Access Prior Learning: • Connect to all previous work and models for combinations within 10. Developing the Big Idea and key Strategic Behaviors: • understanding the commutative property • operating with fluency with combinations within 10 • collecting and graphing data	Guiding Question: • What information can you get from a graph? Instructional Notes: • Accurate vocabulary use of the terms "expression" and "equation" will support students. An expression is just the addends (3+4), whereas an equation includes the equal sign and the sum (3+4=7). • Consider utilizing the Work Place Sentence Frames found on the Educator Site to support students' communication. Enrichment: • Students may choose different target sums of 7, 8, 9, or 10. If you have students far beyond this in their math fluency, increase the target sum appropriately, and have them create their own game board. Child Watching: • The *Work Place Differentiation* chart found on page 26 in your *Assessment Binder* under the tab "Bridges Unit Assessment" may be a helpful tool for your *Work Place* Child Watching. • This *Work Place* supports perceptual and conceptual subitizing. Consider covering the beans after a short time (3 seconds), then asking students to tell what they saw. Uncover the beans and discuss how they might see groups of beans without counting (perceptual subitizing), and how they might combine groups together to reach a total (conceptual subitizing).
Module 1- Session 2: Introducing Work Place 3B Make the Sum		
1.OA.3 1.OA.5 1.OA.6 MP.2 MP.7	Access Prior Learning: • Connect to all previous work and models for combinations within 10. Developing the Big Idea and key Strategic Behaviors: • understanding the commutative property • understanding the associative property • counting on	Guiding Questions: • What are different ways can you compare numbers? • Does the order of numbers change the sum? Why? Why not? Instructional Notes: The big idea of the commutative and associative properties appears in this lesson. Support students in seeing that changing the order of numbers while adding (commutative property) does not change the total. We can also add any two adjacent numbers together (associative property) without changing the sum. Help students connect these properties to the benefit of grouping numbers in easier-to-add groups. For example, if they pull a 2, 4, 6, & 2, they can move the 2 cards next to each other and have a double, 2+2. Then students will have 4+4, which is another double. Capitalize on this instructional opportunity to discuss the commutative and associative properties deeply. *-continues on next page-*

	• operating with fluency with combinations within 10	• Some students may need support noticing that a sum can be created using more than two cards. Enrichment: • See *Game Variations* A, B, C & D on the *Work Place Guide* (p. T9). Child Watching: • Identify students who are still counting each dot on the cards. Ask them if they have to count them all in order to know how many dots there are. Practice with a few quick flash looks to help them subitize. • Identify students who move cards around (applying the commutative and associative property) to add. Highlight this strategy to other students.
Module 1- Session 3: Doubles, Evens & Odds		
1.OA.3 1.OA.6 MP.2 MP.7	Access Prior Learning: • Make connections to doubles understanding. Developing the Big Idea and key Strategic Behaviors: • understanding the number structure – odd and even • using doubles • operating with fluency with combinations within 10	Guiding Question: • What do you already know about doubles? Instructional Notes: • Read the *Math Practices in Action* in the margin (p. 16). • The idea of even and odd numbers is not a 1st grade but 2nd grade standard. The point of this lesson is to focus on the strategic use of doubles plus one, and doubles minus one as a reasoning strategy in the development of math fluency. • Research supports the use of fingers to create perception and representation of numbers as the somatosensory finger area, a specific region of our brain, is developing. "It is important to remove the stigma from counting on fingers and to see this activity as inherently important and valuable" (Boaler, n.d.). Encourage continued use of finger representations to develop this finger perception. Refrain from developing a climate where the use of fingers for problem solving is seen in a negative way. "6-year old's finger representation was a better predictor of future mathematics success than their scores on tests of cognitive processing" (Boaler, n.d.). Enrichment: • See Step 16 (p. 18) and *Game Variations A* on the *Work Place Guide* (p. T12). Child Watching: • Identify students who are struggling to double numbers or add 1 or subtract 1. Support them using the differentiation ideas (p. T11).
Module 1- Session 4: Introducing Work Place 3C Doubles Plus or Minus One		
1.OA.5 1.OA.6 MP.2 MP.7	Access Prior Learning: • Make connections to doubles understanding. Developing the Big Idea and key Strategic Behaviors: • understanding the number structure – odd and even • using doubles plus 1 and minus 1 • operating with fluency with combinations within 10	Guiding Question: • What happens when you add 1 or subtract 1 from a number? Enrichment: • See Step 5 (p. 21). Child Watching: • Watch for strategic behaviors - who is counting all by 1s; who starts from a number and counts on by 1s; who makes a 10 (5); who is counting back. • Have students share strategically, gradually building up from a lower strategic level of sophistication to a higher level. • Students may be confused with the two steps of the game because this is the first game that has two-step directions. Help students notice that if their answer is not on the board they missed a step. Be prepared to reteach this game. Offer peer support as needed.
Module 1- Session 5: Number Rack Story Problems		
1.OA.1 1.OA.4 1.OA.7 1.OA.8 MP.1 MP.4	Access Prior Learning: • Make connections to doubles understanding. Developing the Big Idea and key Strategic Behaviors: • making meaning of story problems • using doubles plus 1 and minus 1 • operating with fluency with combinations within 10	Guiding Questions: • How do math tools help you in solving problems in math? • How can the number rack help you solve story problems? Instructional Notes: • Revisit the poster for MP.1 and encourage a focus on making sense of a problem. • Read the *About This Session* note in the margin (p. 24). • This lesson is a great opportunity to reinforce the meaning of the equal sign meaning "the same as" and not "is the answer to". A balance scale and cubes can help students visualize this. Consider showing how 5+3 cubes on one side balances with 4+4 cubes on the other side. *-continues on next page-*

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- Refer to page 88 in the 2010 NVACS (right). This chart shows how the complexity of problems increases from left to right and top to bottom. Your students may struggle with the quick increase in complexity with the problems in this lesson. Consider framing your own problems, such as a Take From Result Unknown type, between problems 1 & 2. For example, *Amber gathered 20 acorns and put them by a tree, a squirrel ran away with 7. How many were left?* Then continue with problem 2. You might also scaffold support from left to right across the top. Do problem 1, followed with your own creation for Add To Change Unknown, *(11 acorns fell off the tree onto the ground. The wind picked up and more fell. Now there are 19 acorns. How many fell to the ground after the wind blew?)* Then try problem 4. Use this chart to help you create your own problems to support students.

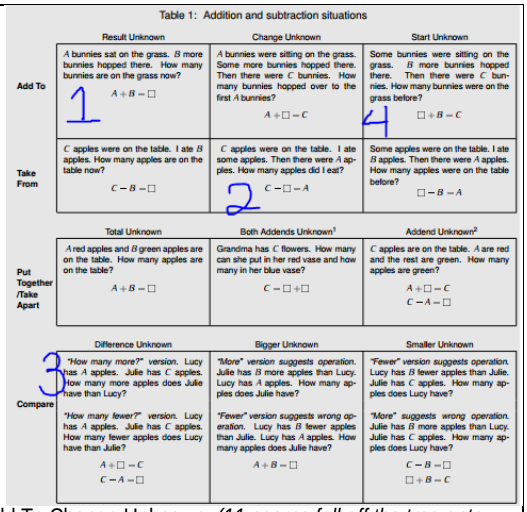
Table 1: Addition and subtraction situations

	Result Unknown	Change Unknown	Start Unknown
Add To	A bunnies sat on the grass. B more bunnies hopped there. How many bunnies are on the grass now? $A + B = \square$ (1)	A bunnies were sitting on the grass. Some more bunnies hopped there. Then there were C bunnies. How many bunnies hopped over to the first A bunnies? $A + \square = C$	Some bunnies were sitting on the grass. B more bunnies hopped there. Then there were C bunnies. How many bunnies were on the grass before? $\square + B = C$ (4)
Take From	C apples were on the table. I ate B apples. How many apples are on the table now? $C - B = \square$	C apples were on the table. I ate some apples. Then there were A apples. How many apples did I eat? $C - \square = A$ (2)	Some apples were on the table. I ate B apples. Then there were A apples. How many apples were on the table before? $\square - B = A$
	Total Unknown	Both Addends Unknown[1]	Addend Unknown[2]
Put Together /Take Apart	A red apples and B green apples are on the table. How many apples are on the table? $A + B = \square$	Grandma has C flowers. How many can she put in her red vase and how many in her blue vase? $C = \square + \square$	C apples are on the table. A are red and the rest are green. How many apples are green? $A + \square = C$ $C - A = \square$
	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare	*"How many more?" version.* Lucy has A apples. Julie has C apples. How many more apples does Julie have than Lucy? *"How many fewer?" version.* Lucy has A apples. Julie has C apples. How many fewer apples does Lucy have than Julie? $A + \square = C$ $C - A = \square$ (3)	*"More" version suggests operation.* Julie has B more apples than Lucy. Lucy has A apples. How many apples does Julie have? *"Fewer" version suggests wrong operation.* Lucy has B fewer apples than Julie. Lucy has A apples. How many apples does Julie have? $A + B = \square$	*"Fewer" version suggests operation.* Lucy has B fewer apples than Julie. Julie has C apples. How many apples does Lucy have? *"More" suggests wrong operation.* Julie has B more apples than Lucy. Julie has C apples. How many apples does Lucy have? $C - B = \square$ $\square + B = C$

Enrichment:

- Increase the complexity of problem types or quantities within the problem for students who need more of a challenge.

Child Watching:

- Help students act out the problems if they struggle with understanding what the problem is asking. Consider having students' direct model with concrete manipulatives.
- Watch for strategies students are using.
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<td colspan="3">Module 2- Session 1: Introducing Work Place 3D Tower Race</td>
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<td>1.OA.6
1.OA.8

1.MP.2
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<td>Access Prior Learning:

- Students worked with decomposing numbers less than or equal to 10 into pairs in more than one way in kindergarten.

Developing the Big Idea and key Strategic Behaviors:

- operating with fluency with combinations within 10
- decomposing numbers less than 10 in multiple ways
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<td>Guiding Question:

- What many different combinations can you make from a set of cubes?

Instructional Note:

- The big idea of this game is to give students the opportunity to engage in decomposing numbers to support their fluency with combinations within 10. Modify rules as needed.

Enrichment:

- See the Work Place Guide Assessment & Differentiation Chart (p. T1).

Child Watching:

- Identify students struggling to see different combinations within numbers.
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<td colspan="3">Module 2- Session 2: Flash Attack</td>
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<td>1.OA.6

MP.5
MP.7</td>
<td>Access Prior Learning:

- Connect with prior subitizing.

Developing the Big Idea and key Strategic Behaviors:

- subitizing
</td>
<td>Guiding Question:

- What parts can you see within a number?

Instructional Note:

- If students need a second flash, show them again. However, refrain from just showing them the beads for a longer time. This encourages them to count, which is the behavior you want them to change. Rely on other students sharing their strategies for "seeing" the numbers to support those who may be struggling.

Enrichment:

- See the extensions in the margin and consider increasing the quantity of beads within 20 if your students are ready for this (p. 13).

Child Watching:

- Identify students still counting all beads by ones. See the support note (p. 13).
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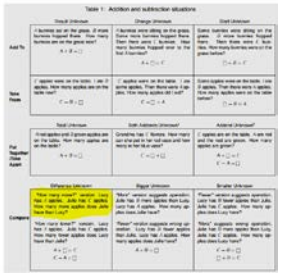
Module 2- Session 3: Make Ten		
1.OA.1 1.OA.3 1.OA.6 1.OA.8 1.NBT.4 MP.7 MP.8	Access Prior Learning: • Students decomposed numbers less than or equal to 10 into pairs in more than one way in kindergarten. Developing the Big Idea and key Strategic Behaviors: • operating with fluency with combinations within 10 • decomposing numbers less than 10 in multiple ways	Guiding Question: • What do you know about the number 10? Instructional Notes: • Read the About this Session in the margin (p. 16). • Encourage students to write their equations horizontally as well as vertically on the student workbook pages 13-14. • Consider choosing a few students who showed their work on #4 to share. This will help other students see ideas on communicating their thinking in writing. Enrichment: • See Step 3 - extend to combinations of 15, then 20 (p. 16). • See the Challenge problem # 5 of student book (p. 14). Child Watching: • Identify students struggling with combinations within 10. Adjust the quantity to within 5, if needed.
Module 2- Session 4: Hot Air Balloons		
1.OA.1 1.OA.3 1.OA.6 1.OA.7 1.OA.8 MP.1 MP.7	Access Prior Learning: • Connect back to Module 1 Session 5, Number Rack Stories. • Identify existing schema about hot air balloons. Developing the Big Idea and key Strategic Behaviors: • understanding of part/whole relationships • counting on • counting back	Guiding Questions: • What do you know about finding the total? • What do you know about finding the parts of a whole? • How many different ways can you think of? Instructional Notes: • The Assessment Binder under the Bridges Unit Assessment Tab provides the scoring guide for the Combinations of Ten Checkpoint (p. 29). • Continue to provide more learning opportunities around 1.OA.3, by using the "Hot Air Balloon" problem to create another story problem that includes 3 addends. For example, "*There are 10 hot air balloons. Some are black, some are white, but others are red. Create an equation representing the possible numbers of each color. Explain your equation with objects, drawings and equations.*" Other variations of this problem could include providing students with the numbers of each color balloon and asking students to find the sum. *There are 3 red, 5 white, and 2 black balloons. How many balloons are there in total?* Choose numbers that encourage students to find anchors of 5 and 10, and order them in ways that encourage rearrangement. • Consider having students model multiple ways to show equations for each discussed balloon race problem. 10- ?= 8, 10-2= ?, 10= 2 +8 and so on. • Consider having multiple tools available for students to choose. Students may find working with unifix cubes or number racks helpful. Students should regularly be given choices for tool selection. • Remind students of Math Practice 1. Help them understand that mathematicians make sense of a problem by visualizing, acting out, or modeling problems in mathematics. Enrichment: • See the *Work Place Game Variations* (in each *Work Place Guide*). Child Watching: • Any students who does not demonstrate security in their working knowledge of key number facts and fact strategies for single-digit addition and subtraction may need extra teacher support. See the *Support and Intervention* page under the *Bridges Unit Assessment* tab (p. 35). • Use the *Combinations of Ten Checkpoint* to formatively assess students.
Module 2- Session 5: Number Rack Subtraction		
1.OA.1 1.OA.6 1.NBT.3 1.MD.3 1.MD.4 MP.4 MP.5	Access Prior Learning: • Solving addition and subtraction word problems, and adding and subtracting within 10 were addressed in kindergarten. Developing the Big Idea and key Strategic Behaviors: • understanding part/whole relationships • comparing to find the difference	Guiding Question: • How does the number rack help you see number relationships? *-continues on next page-*

		Instructional Notes: • The Number Rack Subtraction problems delve directly into Compare Difference Unknown problem types, as seen again in the NVACS (2010, p. 88) or in K-5 Progression on Counting and Cardinality and Operations and Algebraic Thinking (p. 7). • These are some of the most difficult problem types for students to work with, as there is no action to model. "The challenge of comparison problems comes from the fact that two quantities are being described by language that can be complex for children. Fewer, less than, more, bigger and greater than are the terms typically used to describe the relationships in comparison problems." (Van de Walle, 2014, p. 131).  • Support students by connecting to comparison situations they are familiar with, such as siblings comparing the number of cookies, or toys. Children understand the idea of "who has more" in this context. • Consider using the question "how many more to catch up" as another way of understanding comparison problems. • Use the Number Rack app to modify the bead string to use only one string if needed. • Consider making explicit use of the *Difference Word Resource Card* and posting this vocabulary in an easy access location. Enrichment: • See the *Work Place Game Variation* (p. T7).
Module 3- Session 1: Ten & Some More		
1.OA.6 1.NBT.1 1.NBT.2 1.NBT.2a 1.NBT.2b 1.NBT.3 1.NBT.4 MP.5 MP.6	Access Prior Learning: • Students in kindergarten worked with knowing number names and counting the sequence. • Kindergarten students also worked with numbers 11-19 to gain foundations for place value. Developing the Big Idea and key Strategic Behaviors: • understanding 10 and some more • understanding place value • writing equations	Guiding Question: • What do you know about teen numbers? Instructional Note: • It is important to refer to numbers by their quantity and by their numeral names. For example, frequently refer to thirteen as both 13 and "one ten and 3 ones." As indicated 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. Many decade numbers sound much like teen number words. For example, 'fourteen' and 'forty' ……and because the number words 'eleven' and 'twelve' do not cue students that they mean '1 ten and 1 one'" (pp. 6-7). Enrichment: • See game variations on *Work Place Guides.* Child Watching: • Identify students who may be struggling with identifying 10s and 1s, or representing numbers with 10s and 1s separately. Support them by having them make the number in ones only, and physically construct a tower of 10.
Module 3- Session 2: Fifty or Bust! Day 1		
1.OA.6 1.NBT.1 1.NBT.2a 1.NBT.2b 1.NBT.3 1.NBT.4 MP.5 MP.6	Access Prior Learning: • Students in kindergarten worked with knowing number names and counting the sequence. • Kindergarten students also worked with numbers 11-19 to gain foundations for place value. Developing the Big Idea and key Strategic Behaviors: • understanding 10 and some more	Guiding Questions: • If you have an older brother or sister, how many years older are they than you are? • How many years would it take you to catch up to how old they are now? • How can what you know about 10 help you? Instructional Note: • Continue to ask students, "How many more do you have?" and "How many more do you need to get to 50?" and/or "How many to catch up?" Model this language so students will also ask these questions during this independent Work Place. Enrichment: • Ask students to record the equations as they answer the questions throughout game play. Child Watching: • Identify students operating on 10s and 1s separately. Do they count by 10s then add on by 1s, or are they counting every cube individually by 1s? Do students color in the next 10 train each time, even if it means leaving holes to fill in later? (See Step 9).

Module 3- Session 3: Fifty or Bust! Day 2		
1.OA.6 1.NBT.1 1.NBT.2a 1.NBT.2b 1.NBT.3 1.NBT.4 MP.5 MP.6	Access Prior Learning: • Students in kindergarten worked with knowing number names and counting the sequence. • Kindergarten students also worked with numbers 11-19 to gain foundations for place value. Developing the Big Idea and key Strategic Behaviors: • understanding 10 and some more	Guiding Questions: • How do you know when to stop so you do not go over 50? • How can what you know about 10 help you to figure it out? Instructional Notes: • Carefully model aloud your thinking and strategy as you play the game. • See this game from the resources on the Bridges Educator site as another tool. • See Math Practices in Action, p. 17. Enrichment: • For more challenge, play with cards face down in the pocket chart. Child Watching: • Identify students operating on 10s and 1s separately. Do they count by 10s then add on by 1s, or are they counting every cube individually by 1s? Do the students color in the next 10 train each time, even if it means leaving holes to fill in later? (See session 2, Step 9).
Module 3- Session 4: Introducing Work Place 3F Fifty or Bust!		
1.OA.6 1.NBT.1 1.NBT.2 1.NBT.2a 1.NBT.2b 1.NBT.3 1.NBT.4 MP.5 MP.6	Access Prior Learning: • Students in kindergarten worked with knowing number names and counting the sequence. • Kindergarten students also worked with numbers 11-19 to gain foundations for place value. Developing the Big Idea and key Strategic Behaviors: • understanding 10 and some more	Guiding Questions: • How do you know when to stop so you do not go over 50? • How can what you know about 10 help you to figure it out? Enrichment: • See game variations on *Work Place Guide* (p. T5). Child Watching: • Identify students operating on 10s and 1s separately. Do they count by 10s then add on by 1s, or are they counting every cube individually by 1s? Do the students color in the next 10 train each time, even if it means leaving holes to fill in later? (See session 2, Step 9).
Module 3- Session 5: Unit 3 Assessment		
1.OA.6 1.OA.8 1.NBT.2 1.NBT.2a 1.NBT.2b MP.2 MP.6	Access Prior Learning: • Students in kindergarten worked with knowing number names and counting the sequence. • Kindergarten students also worked with numbers 11-19 to gain foundations for place value. Developing the Big Idea and key Strategic Behaviors: • understanding 10 and some more • using direct modeling • using counting strategies • using reasoning strategies	Instructional Notes: • The *Assessment Guide* under the *Bridges Unit Assessments* tab provides the scoring guide for the Unit 3 Assessment (p. 32). • This is the teacher's opportunity to formatively assess students' use of reasoning strategies, and determine what phase students are working towards for fluency development. • There may be confusion in the practice problem because 5 beads are showing and 5 beads are hidden. Consider doing an additional practice problem to confirm students understand they are determining the beads hidden rather than the amount shown. • Section 2 of the assessment asks students to draw a line indicating the last answer they were able to complete within 3 minutes. The purpose of this is to help teachers determine who is using counting strategies rather than using reasoning strategies. Throughout the unit, teachers have been child watching and likely have a strong idea through anecdotal observations of the strategies used by students. If your child watching observations have provided you with enough information to determine student strategy use, it may not be necessary for this section of the assessment. Child Watching: • Observe how students are using tools. • Observe students drawing the missing beads on the assessment, and then counting them by 1s. • Are students using the unifix cubes with 10s and 1s separately? Are they trusting in the ten (using conservation) and counting on? Are they recounting by 1s? If you see students are recounting the 10, provide support by developing concept of conservation.
Module 4- Session 1: Equivalent Names: Sixes & Sevens		
1.OA.3 1.OA.6 1.OA.7 MP.2 MP.4	Access Prior Learning: • Several standards in Kindergarten call for "drawing an equation" (NVACS, 2010, K.OA.3, K.OA.4, K.NBT.1). Developing the Big Idea and key Strategic Behaviors: • understanding the commutative property	Guiding Questions: • How can cubes help you find different combinations for numbers? • How can they help you write different expressions and equations? *-continues on next page-*

	• understanding the associative property • writing equivalent expressions for 6 and 7	Instructional Notes: • Focus on the big idea that there are multiple equivalent names, and that the equal sign means "the same as." • Use the term expression (5+2) to show the operation, but the term equation (5+2=7) to represent the idea of equivalence. Phrases such as "the same number as" and "becomes" can help solidify the understanding of the equal sign definition. • Consider pulling out a balance scale again to represent how each side is the same. • Use trains with both two and three colors. Continue to develop students' understanding of the commutative and associative properties by having students rearrange the colors in different order(s) and record different possible equations for each train. • Class discussion can center on the orders that are easier to add. Child Watching: • Identify students who understand and utilize the idea of commutativity (3+4, 4+3). • Identify students exploring 3 addends and using associativity.
Module 4- Session 2: Equivalent Names: Nines & Tens		
1.OA.3 1.OA.6 1.OA.7 MP.2 MP.4	Access Prior Learning: • Several standards in Kindergarten call for "drawing an equation" (K.OA.3, K.OA.4, K.NBT.1). • Connect to the work done in the previous lesson with 6s and 7s. • Review terms true and false. Developing the Big Idea and key Strategic Behaviors: • understanding the commutative property • understanding the associative property • writing equivalent expressions for 9 and 10	Guiding Questions: • How can cubes help you find different combinations for numbers? • How can they help you write different expressions and equations? Instructional Notes: • Having students examine equations and identify true/false statements encourages them to evaluate the equations. You may need to discuss the meaning of true and false beforehand. • The balance scale can be helpful again to determine true/false. • This online resource suggested on the Bridges Educator Site provides a useful digital scale (Select the "Number Balance Activity"). • Use trains with both two and three colors. Continue to develop students' understanding of the commutative and associative properties by having students rearrange the colors in different orders and record different possible expressions and equations for each train. • Class discussion can center on the orders that are easier to add. Enrichment: • Using 3 colors to create 3 addends is more challenging. Child Watching: • Observe for misconceptions regarding the meaning of the equal sign, specifically if the sum is presented first in an equation. • Identify students who understand and utilize the idea of commutativity (3+4, 4+3). • Identify students exploring 3 addends and using associativity.
Module 4- Session 3: Comparing Cube Trains		
1.OA.1 1.OA.7 1.OA.8 1.NBT.3 MP.2	Access Prior Learning: • Connect to students' previous learning utilizing the comparison symbols (<, >, =) from the 50 or Bust Work Place. Developing the Big Idea and key Strategic Behaviors: • understanding numbers and their relationships • comparing quantities • writing inequality equations	Guiding Question: • What do you already know about comparing quantities? Instructional Notes: • Utilize dots for support for drawing the greater than and less than symbols rather than the "alligator gimmick". This keeps the focus on the mathematics and not on remembering gimmicks in order to do math. The larger quantity of dots (2) is nearer the greater number. The smaller number of dots (1) is nearer the smaller number. • Have unifix cube trains available for students who need to compare actual quantities using concrete materials.   Enrichment: • See Step 13 in the lesson (p. 17). Child Watching: • Identify students' strategies for determining "How many to catch up?" Are they counting on from the larger number or the smaller number, or counting back? Are any students using their knowledge of fact families? Encourage students to share responses and rationale.

Module 4- Session 4: Comparing Cube Towers		
1.OA.1 1.OA.7 1.OA.8 MP.2 MP.4	Access Prior Learning: • Remind students of previous learning utilizing the comparison symbols (<, >, =) from the last session. Developing the Big Idea and key Strategic Behaviors: • comparing quantities • finding the difference • solving for an unknown	Guiding Question: • What do you already know about comparing quantities? Instructional Notes: • Explicitly use the vocabulary resource card for *difference.* Note that difference in this lesson is comparison, not the action of removing or "taking away" although it is represented with a minus symbol. • Directly modeling compare problems supports students as they develop this understanding. Comparison/difference unknown problems are some of the most difficult problem types 1st graders will encounter. See page 88 in the NVACS for this table (2010). Enrichment: • See Step 14 (p. 22). Child Watching: • Identify students struggling with problem solving with larger quantities and reduce the quantity to 6 or less. Provide opportunities to match or directly compare with connecting cubes (match, match, match, leftovers).
Module 4- Session 5: Number Rack Detectives		
1.OA.6 1.OA.7 1.OA.8 MP.2 MP.4	Access Prior Learning: • Students have used a variety of strategies (direct modeling, counting strategies, and using a known fact) previously. • They are also familiar with solving for an unknown. Developing the Big Idea and key Strategic Behaviors: • understanding part-whole relationships • solving for an unknown • using reasoning strategies	Guiding Questions: • What do you already know about the parts of numbers • How do you find a missing part? Enrichment: • See Step 8 (p. 26). Child Watching: • Note as utilize the support suggestions in Step 8 (p. 26) as needed.

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