

Bridges in Mathematics Second Edition Grade 2 Teachers Guide Unit 3 Sample Version

The Math Learning Center, PO Box 12929, Salem, Oregon 97309. Tel 1 (800) 575-8130 www.mathlearningcenter.org

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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Unit 3 Addition & Subtraction Within One Hundred

Overview

This unit focuses on strategies for multi-digit addition and subtraction within the range of 0 to 100. The first module emphasizes the number line model and encourages students to develop the strategy of using "skip-jumps" based on multiples of 5 and 10. The second module continues to use the number line as a computational tool through which students add and subtract 2-digit numbers. The third module focuses on addition and subtraction, but uses the base ten structure (collecting ones and tens). Finally, the fourth module requires students to determine the frequency with which various colored objects appear in a bag and to graph the data.

Planner

Module	Day	Session & Work Places Introduced	P&I	WP	Α	нс
Module 1 Tens & Ones	1	Session 1 Unit 3 Pre-Assessment		٠	٠	•
Students work with numbers in the range of 0 to 100. They count,	2	Session 2 Skip Trips	•	•		
ematical concepts such as place value and multiples of 5 and 10. They make "skip-jumps" on the number line. The teacher flashes images to help students quickly recognize benchmark amounts	3	Session 3 Introducing Work Place 3A Star Power Work Place 3A Star Power		٠		•
of 5 and 10 and then use those benchmarks to combine numbers	4	Session 4 Sticks & Bundles	•	•		
and find the total number of objects represented.	5	Session 5 Stick Flash Work Place 3B Five in a Row	•	•		•
Module 2 Adding & Subtracting on the Number Line	6	Session 1 How Much Older?	•	•		
In this module, students develop facility with the number line as a model for addition and subtraction within the range of 0 to 100. Students are asked to model and solve story problems that	7	Session 2 Solving Problems on the Open Number Line	•	•		•
require either addition or subtraction with double-digit numbers.	8	Session 3 Height & Length Problems	•	•		
They are encouraged to develop confidence with the "skip-jump" strategy by moving in both directions on the number line by increments of 1. 5. and 10.	9	Session 4 Introducing Work Place 3C Hit the Zone		•		•
	10	Session 5 Addition & Subtraction Checkpoint		•	•	
Module 3 Present & Parcel Story Problems with Two-Digit Numbers	11	Session 1 Introducing Presents & Parcels	•	•		•
Throughout these seven sessions, students work with 2-digit		Work Place 3D Base Ten Triple Spin				
(representing 1s) and parcels of presents (representing 10s).	12	Session 2 Solving Picture Problems	•	•		
Students learn to identify the key information in a story problem,	13	Session 3 Creating Picture Problems, Part 1	•	•		•
their own story problems, and then solve the problems created by	14	Session 4 Creating Picture Problems, Part 2	•	•		
their classmates. Two new Work Places, Base Ten Triple Spin and Target Twenty, give students practice with modeling, reading, and comparing 3-digit numbers, as well as solving addition facts to 20.	15	Session 5 Solving Student-Posed Story Problems Work Place 3E Target Twenty	•	•		•
	16	Session 6 Shopping for Story Problems			•	
	17	Session 7 Unit 3 Post-Assessment			٠	•
Module 4 Data & the Many Colors Project	18	Session 1 The Many Colors Project, Part 1	•	•		
In this module students investigate the frequency with which	19	Session 2 The Many Colors Project, Part 2	•	•		•
various colors show up in bags of objects. Counting the numbers of each color in individual bags, graphing, comparing, and then examining class data enable students to make predictions about the colors likely to turn up most frequently in all bags. When students graph the class data, they assign each box a value of more than 1.	20	Session 3 The Many Colors Project, Part 3	•	•		

P&I - Problems & Investigations, WP - Work Place, A - Assessment, HC - Home Connection

Mathematical Background

Concepts

One of the goals for second grade is that students develop a solid sense of our number system, as well as informal understandings of mathematical models that can be used to represent numbers, number relationships, and actions on numbers (e.g., addition and subtraction). Unit 3 has been written to address these goals, fostering the development of a foundation for later work in third grade.

Several significant mathematical concepts are central to the unit. First, the concept of "counting" should not be taken for granted. While some students count intuitively and naturally to 100 well before second grade, others must not only practice counting before it is internalized, they must also be led to understand the connection between counting and calculating. For example, counting by 10s is helpful for developing counting sequence fluency; it is also helpful for understanding that 2 groups of 10 is 20 (i.e., 10 + 10 = 20).

Such number patterns and sequences naturally lead to the development of an understanding of place value, a second critical mathematical concept embedded in the unit. Place value understanding includes the awareness that the placement of a digit within a given number determines the value, or the unit, that the digit represents. Both skip-counting and splitting strategies (explained below) depend heavily on the notion of place value. Within the unit, students use base ten concepts to orient their actions on the number line. They also work with objects and contexts that highlight the notion of "collecting" groups of 10 or 1.

Models

Two primary models are used repeatedly throughout this unit: the number line, and base ten models (e.g., sticks and bundles, packages and parcels).

The Number Line

The open number line is important because it promotes creative solution strategies and intuitive reasoning. A prevalent view in contemporary math education is that students should be given freedom to develop their own solution strategies. To be clear, this perspective does not mean that it is simply a matter of allowing students to solve a problem however they choose. Rather, the models being promoted by the teacher should themselves push the student toward more elegant, sophisticated, and reliable strategies and procedures. The number line not only can be used to model mathematical contexts, but also can represent student methods, thinking progressions, and solution strategies.

Base Ten Models

In addition to the open number line, students also have opportunities to use base ten models in Unit 3. These models facilitate thinking around groups of 10 and 1. Base ten models have long been used to illustrate our place value system, promoting the idea of groupings of like units. Examples of grouping models include tallying with bundled objects (sticks and bundles, packages and parcels, base ten blocks, etc.), or perhaps money units (\$1, \$10, \$100 bills). Tallying objects, and subsequently putting them into groups of 10, provides a strong link to counting. In contrast, money units tend to be much more abstract for students. In either case, students should be given many opportunities to count and organize objects into readily identifiable groupings of 10 objects.

It should be noted that asking students to use base ten models prematurely, without sufficient practice in counting by 10s and 1s on the number line, can lead to conceptual difficulties. For example, consider the statement that, "Ten ones makes 1 ten." While intuitively obvious to adults, perhaps, this concept can be difficult for students to grasp, rendering the use of base ten area pieces (or bundles, etc.) potentially problematic for those students who have not developed a strong sense of our number system. This is not to say that base ten models do not have value; they certainly do. Only, it is imperative that teachers recognize that base ten area pieces may not be as intuitively obvious and conceptually accessible to all their students.



Virtual Manipulatives

Web and mobile versions of the geoboard, number line, base ten pieces, and number rack are available from The Math Learning Center.

Math Vocabulary Cards

Similar to the Word Resource Cards included in Bridges kits, the Math Vocabulary Cards app (available for web and iOS) helps students deepen their conceptual understanding of key terms in mathematics. Each card features a math term, a representative example or model, and a concise definition.

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Strategies

Several primary strategies for addition and subtraction are noted and elaborated (to various degrees) in Unit 3.

Strategy	Example
Calculating by Counting Students may be tempted to continue to use this strategy given that it is probably the first and most natural method young children use to add and subtract (adding on by 1s; taking away by 1s). Supported by counters of various types, students become adept at calculating by simply combining groups of objects and counting them by 1s. Although this strategy may be prevalent among students at the beginning of second grade, it should be quickly discouraged in favor of more efficient strategies based upon more robust models (e.g., the open number line).	38 + 9 = 47 38 39, 40, 41, 42, 43, 44, 45, 46, 47
Skip-Jumping The "skip-jump" strategy for 2-digit addition and subtraction is based heavily on visual representations of number operations on a number line. When calculating by skip-jumping, students often make jumps of 10 or jump from one multiple of 10 to another.	38 + 29 = 67 Jump by 10 $+ 10 + 10 + 24 + 7$ $38 + 48 - 58 + 60 + 67$ Jump via multiples of 10 $+ 24 + 10 + 10 + 7 + 7$ $38 + 40 - 50 + 60 + 67$
Subtracting on the Number Line One of the great benefits of the number line is that strategies that work for addi- tion can also work for subtraction. The key for using the number line as a tool for subtraction is in helping students recognize subtraction as the process one uses to find the difference between two points on the number line. When they are able to think of subtraction in this way, then they may employ various methods to find the distance between the two numbers of interest – the same methods used for addition.	67 - 38 = 29 Jump by 10 $4 - 2 + -7 + -10 + -10$ $4 + 38 + 40 + 47 + 57 + 67$ Jump via multiples of 10 $4 + 2 + 10 + 10 + 7 + 7$ $4 + 38 + 40 + 50 + 60 + 67$
Splitting As students begin to calculate with 2- and 3-digit numbers, they can make sense of such problems by splitting (or "decomposing") the number into its component parts based on place values. For example, consider the problem $32 + 15$. A student using the splitting method would likely split 32 into 30 and 2 , and then split 15 into 10 and 5. Next, students combine the tens $(30 + 10 = 40)$, and then combine the ones $(2 + 5 = 7)$. As students model such numbers using base ten area pieces, they naturally see the different units (in this case, tens and ones), and then group and add like parts. Place value splitting is an important strategy, and can be thought of as a precursor to understanding the standard algorithm. The more adept students can become at using the splitting strategy in thoughtful ways, the more likely it is that they will develop a repertoire of strategies to apply to number operations.	32 + 15 = 47 30 + 10 = 40 40 + 7 = 47
Keeping One Addend Whole— Adding Friendly Numbers As students develop confidence with adding by (and via) 10s, they recognize the value of keeping one number whole, and operating from there. They can use the place value patterns to jump by friendly numbers, often multiples of 10.	Consider the problem 56 + 14. A student might start on 56 and then decompose (split) the 14 into a group of 10 and 4. Then she adds 10 to 56 to arrive at 66. Next, she adds 4 more to arrive at a total of 70. +10 $+456$ 66 70
Keeping One Addend Whole— Get to a Friendly Number With this variant of the splitting strategy, students keep one addend whole and then add enough to get to a friendly number (often to a multiple of 10 or landmark number like 25). From this new friendly number, they can then jump by a multiple of 10, or some other fruitful number.	Consider the problem 37 + 28. A student might start at 37, and add 3 to get to a friendly number of 40. From 40, he must add 25 more, which might be done in any number of ways (e.g., jump by 20, then 5 more; jump by 10, 10, and 5). +3 + 10 + 10 + 5 + 10 37 40 50 60 65

While these strategies might be thought of as distinct, they clearly compliment one another. For example, students might be using some variation of the splitting strategy, and find it necessary to record the steps of the strategy on an open number line. Likewise, skip-jumping along the number line might well be informed by students' comfort with splitting strategies. Throughout this unit, lessons are tailored to draw students into specific strategy usage. For example, the presents and parcels activities elicit the splitting strategy. Of course, the open number line is used to encourage students to think of skip-jumps as a viable way to calculate with 2-digit numbers. The development of a rich set of intuitive strategies that are based on the base ten and number line models is the intent of Unit 3.

Algebra Connections in This Unit

The algebra connections throughout this unit are linked to the use of the number line. The open number line is a model that is useful well into the typical algebra curriculum. Exposure to this important mathematical model in the primary grades is of paramount importance given the way in which it becomes a central feature in algebraic reasoning. In this unit, for example, students are exposed to a relational view of equality. For example, $19 + 28 = __+ 19$.

Teaching Tips

- Use base ten materials to model place value and splitting (regrouping) strategies. Use the open number line to model other strategies related to jumping by and via 10 on the number line.
- Subtraction modeled with the number line, as noted previously, is closely connected to addition. Subtraction may be thought of as finding the difference between two points on the number line. Subtraction with the splitting strategy is considerably more difficult using base ten models given the need for regrouping that is necessary in many problems such as 34 18.
- As students use an open number line, they should be encouraged to think of the line as a way to record their thinking on paper. That is, they should be encouraged to mark each point on the number line as reflective of their addition or subtraction strategy. Be aware that, although their number line representations may not be perfectly accurate, they are a proxy for the mental images students are developing (which are likely accurately scaled). The younger the child, the more likely it is that he or she will use the number line with some variability.
- With time and experience, encourage students to use the biggest skip-jumps that are manageable for them for each given problem.
- When students are using an open number line to subtract, they might find the difference by jumping up the number line or by jumping down the number line.

Skills Across the Grade Levels

The table below shows the major skills and concepts addressed in Unit 3. It is meant to provide a quick snapshot of the expectations for students' learning during this module, as well as information about how these skills are addressed in Bridges Grade 1; elsewhere in Grade 2, including Number Corner (NC); and also in Grade 3.

Major Skills/Concepts Addressed	Gr. 1	Unit 3	Gr. 2 Elsewhere	Gr. 3
2.0A.1 Solve one- and two-step addition and subtraction story problems with sums and minuends to 100 involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions	N/A	D	Units 1, 2, 4, and 7 NC Jan.–Mar.	R/E
2.OA.2 Fluently add and subtract with sums to 20 using mental strategies	I	D	Units 1 and 2 NC All months	R/E
2.NBT.1 Demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones	I	D	Units 2, 5, and 8 NC Dec., May	R/E
2.NBT.21a Demonstrate an understanding that 100 can be thought of as a bundle or group of 10 tens, called a hundred	I	D	Units 2, 5, and 8 NC Nov.	R/E

Encouraging Student Reflection

Learning Lines

At the end of an activity, have students each draw a line on a whiteboard or small piece of scratch paper and label it with three faces, as shown in the illustration. Then have them mark an X along the line to indicate how well they think they did with the skill, concept, or practice that was targeted for the lesson.



Sam I really like showing and solving problems on an open number line. I'm going to put my X by the smiley face.

Exit Cards

At the end of an activity or session, give students each a $3'' \times 5''$ index card or a small piece of scratch paper and ask them to respond to one final question or problem, or use quick sketches or words to show one thing they learned during math.



A Math Practices Observation Chart is included at the end of the Unit 3 Assessment Guide. Use this chart to track students' application of the CCSS mathematical practices.

Major Skills/Concepts Addressed	Gr. 1	Unit 3	Gr. 2 Elsewhere	Gr. 3
2.NBT.1b Demonstrate an understanding that multiples of 100 from 100 to 900 refer to some number of hundreds and 0 tens and 0 ones	N/A	1	Units 5 and 8 NC Nov.	R/E
2.NBT.2 Skip-count by 5s, 10s and 100s within 1000	N/A	D	Units 2, 5 and 8 NC Sep.–Feb., Apr., May	R/E
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, or the relationship between addition and subtraction	I	D	Units 2, 4, and 5 NC Jan.–Apr.	R/E
2.NBT.6 Add three or four 2-digit numbers	N/A	D	Unit 2 NC Sep., Dec., Jan., Mar.	R/E
2.NBT.9 Explain why strategies for adding and subtracting 2- digit numbers work, using place value and the properties of operations	I	D	Units 7 and 8 NC Jan.–Mar.	R/E
2.MD.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	N/A	М	Units 2, 5, 7, and 8 NC Sep.–Feb., Apr., May	R/E

I – Skill or concept is introduced or reintroduced

D – Skill or concept is developed

M – Skill or concept is expected to be mastered

R/E – Skill or concept is reviewed, practiced, or extended to higher levels

N/A – Skill or concept is not addressed

Assessments

There are three written assessments in Unit 3—a unit pre-assessment at the beginning of Module 1, a checkpoint at the end of Module 2, and a unit post-assessment at the end of Module 3. There is also a problem set in Module 3 that can be collected as a work sample. In addition to these, five Work Places introduced over the course of the unit offer teachers opportunities to observe students' skills in authentic settings. The following chart shows where and when assessment opportunities appear throughout the unit.

Skills/Concepts Assessed	Observational Assessments	Written Assessments
2.OA.1 Use addition and subtraction within 100 to solve one- and two-step story 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		M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S6-7 Presents & Parcels Story Problems Work Sample M3, S7 Unit 3 Post-Assessment
2.OA.2 Fluently add and subtract with sums to 20 using mental strategies	M1, S3 3A Star Power M2, S4 3C Hit the Zone M3, S5 3E Target Twenty	
2.NBT.1 Demonstrate and understand- ing that the digits in a 3-digit number represent amounts of hundreds, tens, and ones	M3, S1 3D Base Ten Triple Spin	
2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s	M1, S3 3A Star Power M3, S1 3D Base Ten Triple Spin	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment
2.NBT.3 Read and write numbers to 1,000 represented with base ten numerals and expanded form	M3, S1 3D Base Ten Triple Spin	



See the Unit 3 Assessment Guide at the end of the unit for scoring guides, answer keys, and intervention suggestions. Scoring guides are also available as Excel files; download them from the Implementation section of the Bridges Educator Site.

Skills/Concepts Assessed	Observational Assessments	Written Assessments
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, or the relationship between addition and subtraction	M1, S3 3A Star Power M1, S5 3B Five in a Row	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment
2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations		M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment
2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units		M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment
2.MD.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	M2, S4 3C Hit the Zone	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment

M – Module, S – Session

Differentiation

The following chart indicates which sessions contain explicit suggestions for differentiating instruction to support or challenge students, as well as to make instruction accessible to ELL students. When a Work Place is introduced, the differentiation suggestions for the Work Place game or activity are included on the Work Place Guide. In addition to these explicit suggestions, you'll find that many of the activities in this unit are open-ended enough that you'll be differentiating your instruction quite naturally.

		Мо	odul	e 1		Module 2			Module 3						Module 4					
Session	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	6	7	1	2	3
Challenge		•	•	•			•	•	•		•			•	•					
Support		•	•	•	•		•	•	•		•	•	•	•	•	•	•			
ELL			•								•			•		•			•	

Work Places as Assessments

In addition to the observational assessment opportunities afforded during Work Places, teachers can use the record sheets students complete in conjunction with the Work Place games and activities to inform instructional decisions.



Teachers Guide

GRADE 2 – UNIT 3 – MODULE 1



Module 1 Tens & Ones

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Session 2	Skip Trips	7
Session 3	Introducing Work Place 3A Star Power 1	3
Session 4	Sticks & Bundles 1	9
Session 5	Stick Flash2	25

Teacher Masters

Pages renumber with each module.	
Unit 3 Pre-Assessment	T1
Unit 3 Work Place Log	T5
2E Steps & Leaps Record Sheet	T6
Leap Tens Spinner	T7
Work Place Guide 3A Star Power	T8
Work Place Instructions 3A Star Power	Т9
3A Star Power Record Sheet	T11
Star Power Team Score Sheet	T12
Work Place Guide 3B Five in a Row	T13
Work Place Instructions 3B Five in a Row	T14

Student Book Pages

Page numbers correspond to those in the consumable books.	
Hit the Target	3

Home Connections Pages

Page numbers correspond to those in the consumable books.

Steps & Leaps	63
Puzzles & Shapes	69
Subtracting on the Line & Solving Story Problems .	71

Digital Resources	D1
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Module 1 Tens & Ones

Overview

Over the next five sessions, students will work with numbers in the range of 0 to 100. Both in the abstract, and with physical models (craft sticks), students count, combine, and organize objects and numbers based on mathematical concepts such as place value, multiples of 5 and 10, etc. While making "skip-jumps" on the number line, students focus on increments of 5 and 10. While organizing and counting a group of objects, students explore place value concepts into the hundreds. The teacher flashes images to help students quickly recognize benchmark amounts of 5 and 10 and then use those benchmarks to combine numbers and find the total number of objects represented.

Planner

Session & Work Places	P&I	WP	Α	нс
Session 1 Unit 3 Pre-Assessment Students take the Unit 3 Pre-Assessment today. They go out to Work Places as they finish their assessments. Finally, the teacher introduces and assigns the Steps & Leaps Home Connection.		•	•	•
Session 2 Skip Trips Students use "skip-jumps" of 1, 5, and 10 to reach a given target on the number line. The goal of the activity is to arrive at the intended target by using as few skip-jumps as possible. Students complete a related worksheet in their Student Books, and then spend any time remaining in the session at Work Places.	•	•		
Session 3 Introducing Work Place 3A Star Power In this session, the teacher introduces Work Place 3A Star Power, which is very similar to Steps & Leaps with one important difference: students can choose to take their steps and leaps in any order. Students play the game in pairs and then go out to Work Places. Finally, the teacher introduces and assigns the Puzzles & Shapes Home Connection.		•		•
Introducing Work Place 3A Star Power The game Star Power is a version of the Steps & Leaps game. Players take turns rolling two dice and spinning the spinner to move toward 100. Players write the numbers on all the spaces they land on along the way and circle any stars they land on. The game continues until one of the players reaches or crosses 100 and wins. Then the total number of Star Points are calculated by counting all the stars that are circled. Players add their Star Points and record them on a class score sheet to compare with other teams.				
Session 4 Sticks & Bundles Today students work together to estimate and then count a large collection of craft sticks, regrouping the sticks into hundreds, tens, and ones as needed. Then the teacher poses several double-digit addition problems to the class. Students solve each problem, and then share solutions and strategies. The teacher highlights the splitting strategy: first adding the tens, then the ones, and then adding the 10s and 1s to get the total. After solving several problems, the students go to Work Places.	•	•		
Session 5 Stick Flash During this session, students continue to develop the splitting strategy to add 2-digit numbers within 100. The teachers quickly flashes different quantities of bundles and sticks and ask students to report how many they saw. Next, the teacher briefly shows two collections of bundles and sticks at the same time and hides them, asking students to report the total. A new Work Place that involves double-digit addition is introduced. Finally, the teacher assigns the Subtracting on the Line & Solving Story Problems Home Connection.	•	•		•

P&I - Problems & Investigations, WP - Work Place, A - Assessment, HC - Home Connection

Materials Preparation

Each session includes a complete list of the materials you'll need to conduct the session, as well as notes about any preparation you'll need to do in advance. If you would like to prepare materials ahead of time for the entire module, you can use this to-do list.

Task		Done
Copies	Run copies of Teacher Masters T1–T12 according to the instructions at the top of each master.	
If students do not have their own Student Books, run a class set of Student Book pages 32–35.		
	If students do not have their own Home Connections books, run a class set of Home Connections pages 63–72.	
Work PlacePrepare students' Work Place folders, following the instructions at the beginning of Session 3, and store them in a box or tub. (Session 3)		
	Prepare the materials for Work Places 3A & 3B using the lists of materials on the Work Place Guides (Teacher Masters T6 and T11).	

Additional Resources

Please see the Resources section at the end of this module for a collection of resources you can use with students to supplement your instruction.

Session 1 Unit 3 Pre-Assessment

Summary

Students spend the first part of this session taking the Unit 3 Pre-Assessment. Those who complete the assessment before the end of the period turn in their papers, get their Work Place folders, and choose a Work Place to do quietly while their classmates finish the assessment. Finally, the teacher introduces and assigns the Steps & Leaps Home Connection.

Skills & Concepts

- Demonstrate an understanding that the digits in a 2-digit number represent amounts of tens and ones (1.NBT.2)
- Solve one- and two-step addition and subtraction story problems with sums and minuends to 100 involving situations of adding to, putting together, taking from, taking apart, and comparing with unknowns in all positions (2.OA.1)
- Skip-count by 5s and 10s within 1000 (2.NBT.2)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Add three 2-digit numbers using strategies based on place value and properties of operations (2.NBT.6)
- Solve addition story problems with sums to 100 involving lengths given in the same units (2.MD.5)
- Represent whole numbers as lengths on a number line (2.MD.6)
- Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)

Materials

Copies	Kit Materials	Classroom Materials		
Assessment				
TM T1–T4 Unit 3 Pre-Assessment	 1 bundle of 10 craft sticks, held together with a rubber band 3 loose craft sticks 			
Work Places in Use				
 1K Turn Them Over (introduced in Unit 1, Module 4, Session 3) 2A Scoop, Count & Compare (introduced in Unit 2, Module 1, Session 2) 2B The Subtraction Wheel (introduced in Unit 2, Module 1, Session 5) 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3 				
Home Connection				
HC 63–68 Steps & Leaps				

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Assessment

Unit 3 Pre-Assessment

1 Open the session by reviewing what a pre-assessment is and describing how you'd like students to work on the pre-assessment they will complete today.

Explain that a pre-assessment is a way for students to see what they will be learning in the next month or so. It is also a tool that helps you do a better job of teaching, because students' responses to the problems on the pre-assessment will help you learn about what they already know and what they still need to learn. For these reasons, there will be some problems on the pre-assessment that they will probably not be sure how to solve, and that's all right.

Explain that you would like students to do the following things as they work on the pre-assessment:

- Work independently.
- Raise your hand if you have a question.
- Try to answer all the problems, even those you don't fully understand.
- Explain how they solved a problem when the directions ask you to. You can use pictures, numbers, and words in your explanations.
- 2 Show students the craft sticks you have prepared—one bundle of 10 and 3 loose sticks. Tell them that they will see pictures of single and bundled sticks like these on the pre-assessment. They can be sure that there are always 10 sticks in the bundles pictured on the assessment sheets.

Remove the rubber band from the bundled sticks and count them with the students to confirm that there are 10. Then bundle them back up and display them with the loose sticks. Have students pair-share how many sticks there are in all, and say the number aloud on your signal.



- 3 Use the display copy of the Unit 3 Pre-Assessment to review the pre-assessment with the class.
 - Display your copy of the pre-assessment and give each student a copy.
 - Read each problem out loud, and clarify as needed.
 - Here are some things to be aware of as you review each of the problems with the class:
 - » As you review the first two problems with the class, you may need to remind students how to draw and label the length of their jumps by using arcs above the number line, and how to label the numbers on which they land on the number line itself. If so, model the process in a manner similar to what's described here.

Teacher To do problems 1 and 2, you're going to have to make and label jumps along the number line like we've been doing for the last week or two. Let's do a quick example together. I'm going to draw an open number line on the board and label it with 0 on the left side. Then suppose I want to make a jump of 15 and then another jump of 24 and see where I land. First I'll make the jump of 15. I'll label the jump, and also the place I land on the line.



See the Unit 3 Assessment Guide at the end of the unit for scoring guides, answer keys, and intervention suggestions.



Teacher Now I want to make a jump of 24, but do I have to make the whole thing at once? I could, but I think I want to make it easier, so I'm going to break it into pieces that are easy to add on to 15. Let's see... I'll go 10 more and label my jump. Where have I landed on the line? What's 15 plus 10?

Students Twenty-five.

Teacher OK, I'll take another jump of 10 and now I'm on what? Help me out so I can label where I landed on the line.

Students Thirty-five.

Teacher So I've jumped 20 of the 24. Now I think I can make the last jump of 4. Where have I landed on the line? What's 35 plus 4 more? **Students** Thirty-nine!



- » When you review problem 3 with the class, help students understand that they have to take jumps of 1, 5, and 10 to go from 0 to 47. They have to use at least one jump of each length, but they can just the lengths in any combination to get to 47. Help them understand that they have to draw an arc to show each jump, and label the jump with its length. They also have to label each number they land on along the line until they reach 47.
- » When you review problem 8 with the class, help students understand that they have to find the mark along the number line that shows each of Sara's lucky numbers and write the number below the mark on the number line.
- 4 Invite students to spend the rest of the period working on the pre-assessment and let them know that they can go to Work Places and work quietly if they finish early.

While students work independently, circulate to observe how they work and answer questions as needed. You might want to make note of students who appear to be relying heavily on by 1s counting, rather than working in 10s and 1s to solve the problems on this assessment. You might need to spend a bit more time working with these students in the weeks and months to come to promote more efficient strategies.

Work Places

- 5 As students finish the assessment, have them turn in their papers, get their Work Place folders, and choose a Work Place to use quietly.
- 6 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Take a few minutes to discuss the Unit 3 Pre-Assessment. Invite volunteers to talk about some problems that seemed easy to them, as well as some that seemed challenging or downright difficult right now.
 - Remind students that they will take a post-assessment again in a few weeks, and when they do, the kinds of problems that seemed hard today may seem easier.

🕮 Home Connection

- 7 Introduce and assign the Steps & Leaps Home Connection, which provides practice with the following skills:
 - Recall from memory all sums of two 1-digit numbers (2.OA.2)
 - Skip-count by 10s within 1,000 (2.NBT.2)
 - Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 100 (2.NBT.5)
- 8 This Home Connection includes a game and a related worksheet. Be sure students understand that they are to play the game Steps & Leaps twice with someone at home, and then do the related worksheet included in the assignment.
 - You might want to review the game instructions with the class so students will feel more confident teaching the game to someone at home.
 - Clarify which of the pages in the assignment you expect the students to return to school, and when.



The Grade 2 Assessment Guide includes a Work Places Differentiation Chart for each unit. If you like, you can use these charts to make notes about which students need support or challenge with the skills featured in each Work Place.

Session 2 **Skip Trips**

Summary

Students use "skip-jumps" of 1, 5, and 10 to reach a given target on the number line. The goal of the activity is to arrive at the intended target by using as few skip-jumps as possible. Teachers may vary the target, the starting point, and the skip-jump intervals to differentiate the activity. After working together as a class to solve some skip trip problems, students complete a related worksheet in their Student Books, and then spend any time remaining at Work Places.

Skills & Concepts

- Skip-count by 5s and 10s within 1000 (2.NBT.2)
- Select and use the appropriate tool for measuring the length of an object (2.MD.1)
- Represent whole numbers as lengths on a number line (2.MD.6)
- Represent whole-number sums up to 100 on a number line (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Use appropriate tools strategically (2.MP.5)

Materials

Copies	Kit Materials	Classroom Materials		
Problems & Investigations Skip Trips				
SB 33–36 Hit the Target		 blue masking tape (see Preparation) tape measure, yardsticks, or rulers student whiteboards, markers, and erasers (class set) 		
Work Places in Use				
 1K Turn Them Over (introduced in Unit 1, Module 4, Session 3) 2A Scoop, Count & Compare (introduced in Unit 2, Module 1, Session 2) 2B The Subtraction Wheel (introduced in Unit 2, Module 1, Session 5) 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Boll & Subtract (introduced in Linit 2, Module 2, Session 4) 				
2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3)				

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

To set the context for today's session, students will try to jump a distance of 5 feet. Prepare for this introductory activity by placing a 5-foot piece of blue masking tape on the floor.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

estimation measurement multiple

Problems & Investigations

Skip Trips

- 1 Set the stage for the session by explaining that students will working with the open, or empty number line in some interesting ways today.
- 2 Have students gather around the length of blue masking tape you put on the floor in preparation for the session. Ask them to pair-share, and then as a whole group, estimates for the length of the line of masking tape.

As students share their ideas, you may want to record some of them on the board. Notice the language students use as they share estimates. Do they give just numbers, such as 5, 10, 100, and so on, or do they talk in terms of non-standard units, such as Unifix cubes or craft sticks, or do they make reference to standard units, such as inches, feet, yards, meters, and so on?

3 Then solicit help from students to measure the length of the tape using a tape measure, rulers, or yardsticks.

Take the opportunity to compare and discuss the actual length (5 feet) with students' estimates.

- 4 Ask students if there is anybody in the class who thinks they could stand at one end of the blue masking tape and jump clear to the other end in a single jump of 5 feet.
 - Let a couple of volunteers try it as the others watch.
 - Reassure the rest of the students that when the session is over, you'll move the piece of tape to the gym or the playground so they can all give it a try.
- 5 Then share some history of the long jump and work with students to measure out the world record of 30 feet.
 - Explain that the long jump is one of the oldest recorded sporting events in human history. It is now a very popular event in track and field, and one of the highlights of the Olympics every four years. Tell the class that the world record for the long jump is nearly 30 feet (29 feet, 5 inches, set by Mike Powell in 1991).
 - Ask students to estimate how long 30 feet is.
 - As a group, decide how to measure and mark a distance of 30 feet.
 - Discuss the remarkable feat of being able to jump nearly 30 feet.
- 6 Next, introduce the idea of taking multiple skip-jumps of a given distance by telling students about another well-known track and field event called the "triple jump."

As you describe the event, link it to the students' experience with the blue masking tape. Chances are, at least one of the volunteers was able to jump a distance of 5 feet. As you talk with students, pose problems in which that particular student might take multiple jumps of 5 feet.

Teacher Did you know that there is another event in track and field (and the Olympics) where athletes get to jump three times in a row? They measure how far they can travel with three jumps. This event is called the Triple Jump, since triple is a word that stands for doing something three times. Let's think about this for a minute. We just saw that Marcus was able to jump 5 feet exactly. I wonder... If Marcus could jump 5 feet each jump, how far would he go if he did the triple jump?

About This Session

The teacher can easily adapt this activity to meet the needs of a variety of students—simplifying for some and extending for others. By changing the skip-jumps allowed, you can reinforce counting by various multiples (e.g., 2, 3, 5, 10). By changing the starting point, you can reinforce adding on from various points (e.g., adding on from 0 or 5 or 10). By changing the endpoint, you can encourage students to repeatedly add a given multiple over some distance (e.g., go from 0 to 30 with skip-jumps of 5). Encourage students to find more than one way to reach the intended target, such as by taking as few jumps as possible. Allowing forward and backward jumps reinforces both forward and backward counting. Over time, students will realize that sometimes the most efficient path to the target may be by jumping past the mark and then backtracking.

Thanh Fifteen feet!

Teacher How did you know that?

Thanh Well... I was thinking that the first jump he went five feet. The second jump would get him to ten. Then he would go 5 more feet to get to 15.

Teacher OK, let's all try DJ's idea. Let's count out loud together by 5s, and imagine what would happen if Marcus kept going jump after jump...

Students and Teacher 5...10...15...20...25...30...35.

7 Now move the discussion to making multiple jumps of longer distances, such as 10 feet, and even 30 feet. Link the idea of multiple jumps to skip-counting as you talk with the students.

Teacher Fantastic. I wonder ... Can we do the same thing with 10? What if Coach Harris could jump 10 feet. Let's see how far he would get if he jumped 5 times in a row. Let's count together.

Students and Teacher 10...20...30...40...50

Teacher Can we keep going to 100?

Students Yes!

Teacher Let's do it. Together now...

Students and Teacher 50...60...70...80...90...100!

Teacher Great! So ... That is what it means to skip-count. You keep jumping by the same amount. OK, now here is a tough one. I wonder ... What if Mike Powell came to visit our class. Mr. Powell can jump 30 feet! Amazing! Suppose he did the triple jump—three jumps, and each jump was 30 feet. Talk with a partner for a few moments. Can you figure out how far Mr. Powell would go if he jumped 30 feet, then another 30, and another 30? For those of you who want a challenge, what if Mr. Powell could jump 34 feet? How far would he go if he skip-jumped three times by 34?

8 At the board, model the idea of taking multiples jumps of 5, then 10, then 30 on the empty number line, similar to the illustration here.





Tools are not only physical devices, technological applications, and the like. The number line and the computational strategies it facilitates are also tools. By inviting students to make jumps of 5, 10, and 30, you are helping them become better able to use appropriate tools strategically.

Unit 3 Module 1 Session 2

- 9 Then introduce Hit the Target, an activity that involves moving from 0 to a given target number on the number line using the fewest jumps possible. Present the first example, jumping from 0 to 15, as something to be accomplished with multiple jumps of 5.
 - Draw an empty number line on the board, with 0 on the left end, and a target of 15 to the right.



Tools for Modeling Mathematics

The Techno Tortoise Demonstrator shows a tortoise positioned at 0 along a number line marked in tens and ones. Each multiple of 10 through 120 is numbered. You can move the tortoise along the line in jumps of 1, 5, and 10 going forward, and jumps of 1 or 10 going backward. You might use this online tool to model the examples in step 9 and confirm students' thinking in steps 10-12.

This and other resources are listed in the Resources section at the end of the module.

Teacher So, how many jumps did we need to go from 0 to 15, jumping by 5?

Students Three.

• Now present the possibility of using jumps of 5 and jumps of 10 instead of multiple jumps of 5. If this is allowed, is it possible to get from 0 to 15 in fewer than 3 jumps?

Teacher Here's another question. What about this? What if you could choose—you could jump by either 5 or 10. Would that make the problem any shorter? Could we use fewer jumps to get from 0 to our target of 15?

Amanda Yes! You could first jump by 10, and then by 5.

- 10 Ask students to model and solve on their whiteboards the problem of getting from 0 to 7 using the fewest number of jumps of 5 and 1.
 - Have helpers distribute whiteboards, pens, and erasers.
 - Ask students to draw an empty number line across their board, make a hash mark at the left side of the line and label it 0, and then a second hash mark at the right side of the line with the number 7 in a circle below the mark.
 - Explain that 7 is their target, and the challenge is to get from 0 to 7 using the fewest jumps of 5 and 1 possible. Remind them to label their jumps, as well as the numbers on which they land each time.
 - Give them a minute to work. Then have them share, first in pairs, and then with the group, their solutions.

Cole I just took a hop of 5 and then 2 more hops of 1 to get to 7. That's 3 hops, but I don't think you can do it in less than that.

Unit 3 Module 1 Session 2



- 11 Now ask students to erase their boards and then model and solve the problem of getting from 0 to 9 using the fewest number of jumps of 5 and 1.
 - After most students have finished, have them pair-share their solutions and strategies.
 - Invite a volunteer to share his solution with the class. He likely will have solved the problem using a total of five jumps: one jump of 5 and four jumps of 1.
 - Ask if anyone has a different solution, and then challenge students to devise a solution that involves fewer than five jumps.
 - Let them wrestle with the problem for a minute, and then let them know that they can jump backward as well as forward by jumps of 5 or 1.
 - If no one comes up with the idea of making two forward jumps of 5 and then one backward jump of 1 to reach 9 in only three jumps, discuss the possibilities that emerge if it's possible to jump backward as well as forward.

Teacher Hmm. I am stumped. There has to be a quicker way to get from 0 to 9. So, here we are at the number 5, after one jump. Now, what options do I have? Remind me. What skip-jumps can I use?
Students Either 5 or 1.
Teacher Right. 5 or 1. I wonder ... Which would get me closest to 9? A jump of 5, or a jump of 1?
Tanisha You have to use 1 because jumping 5 would be too far. It would get you to 10.
Sean But I think we should jump by 5! Because when you jump by 5 you get right next to 9!
Teacher Where would we land if we jumped by 5 again?
Students On 10!
Marcos And then you can jump by 1, but you just have to jump backward!
Rachael And you said we can jump backward, right?

- Ask students to solve the problem again, knowing that they can take jumps of 5 and 1 backward, as well as forward.
- Have them pair-share their work. Then have a volunteer share her solution with the class.



- 12 Introduce and assign the Hit the Target Student Book pages.
 - Read the instructions at the top of the first page with the students, and examine the examples together.
 - Why did it only take 2 jumps to get to 15 on the second number line? Would it be possible to get to 15 in only 1 jump? Why or why not?
 - Discuss the first couple of problems to be sure students understand that they can only use jumps of 1, 5, or 10, and that the idea is to use the fewest jumps possible to solve each problem. Remind them that they can jump forward or backward, but only by 1, 5, or 10.
 - When students understand what to do, have them go to work independently or in pairs.
- 13 As students complete the assignment, have them share, compare, and reconcile their answers with at least one classmate.

SUPPORT To support students who struggle with this activity, you may begin by restricting them to a single skip-jump interval (e.g., you may only jump by 5), and correspondingly, choose starting and target points that match. For example, start at 0, with a target of 10. You may only use skip-jumps of 5. How many jumps to get to 10? To further scaffold the learning, you may choose to label the number line in increments that match the skip-jump interval. So returning to the previous example, to help a student jump from 0 to 10 in two jumps of 5, pre-label the number line with marks of 0, 5, and 10.

CHALLENGE Vary the starting and target points, as well as the jump lengths, to encourage specific strategies, and challenge students to work with skip-jump intervals creatively. For example, restrict students to jumps of 2 and 5, and ask them to start at 0, with 11 as a target. In order to land on an odd number (11) that is not a multiple of 5, they will need to strategically use both 5 and 2. In this case, although two jumps of 5 would land them very close to the target of 11, they will quickly find that 11 is unattainable from 10. Hence, they must approach the target of 11 (by skip-jumping 2) from either 5 or 15. In the first case, they will need 3 more jumps of 2 to get to 11. In the second case, they can jump backward twice to go from 15 to 11. This represents significant thinking for second grade students. You may also extend problems by choosing starting and target points that are not multiples of 5 or 10, or by restricting students to various multiples that do not include skip-jumps of 1, 5, or 10. For example, "Start at 13. Your target is 37. You may use skip-jumps of 2, 3, and 7. What is the fewest number of jumps required to go from 13 to 37?"

🖄 Work Places

- 14 Students who finish the assignment before the end of the session can get their folders and go to Work Places.
- 15 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Write one additional problem on the board: "Go from 0 to 14 in as few jumps as possible. Use skip-jumps of 1, 5, or 10." Have students solve on their whiteboards, and then invite two students to model different strategies at the board. Close the session by emphasizing that what they learned today was how to jump along the number line by a certain skip-jump amount. Remind them that it is always OK to think about skip-jumping in both directions—forward and backward (as evidenced in this final, closing example in which students will likely jump to 15, and then bounce backward by 1).

Session 3 Introducing Work Place 3A Star Power

Summary

In this session, the teacher introduces Work Place 3A Star Power by playing a demonstration game with the class and then having students play the game in pairs. Star Power is very similar to Steps & Leaps, which was introduced in Unit 2, with one important difference: students can choose to take their steps and leaps in any order. This promotes the strategy of anchoring on 10s because players collect a Star Point every time they land on a multiple of 10. While the primary goal of the game is still to be the first to reach or cross 100, a secondary goal is to collect as many Star Points as possible as a team. This game allows students to explore the associative and commutative properties of addition as well as providing opportunities for students to work toward breaking up addends to reach multiples of ten. Finally, the teacher introduces and assigns the Puzzles & Shapes Home Connection.

Skills & Concepts

- Recall from memory all sums of two 1-digit numbers (2.OA.2)
- Skip-count by 10s within 1000 (2.NBT.2)
- Write numbers within 1000 represented with numerals (2.NBT.3)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 100 (2.NBT.5)
- Reason abstractly and quantitatively (2.MP.2)
- Look for and make use of structure (2.MP.7)

Materials

Copies	Kit Materials	Classroom Materials		
Work Places Introducing Work Place 3A Star Power				
TM T5 Unit 3 Work Place Log TM T6 2E Steps & Leaps Record Sheet TM T7 Leap Tens Spinner TM T7 Work Place Guide 3A Star Power TM T8–T9 Work Place Instructions 3A Star Power TM T10 3A Star Power Record Sheet TM T11 Star Power Team Score Sheet	 1 Leap Tens Spinner spinner overlays, half-class set 2 dice numbered 1–6, per student pair 	 students' Work Place pocket folders (see Preparation) kidney or lima beans, 1 per student 		
Work Places in Use				
 2A Scoop, Count & Compare (introduced in Unit 2, Module 1, Session 2) 2B The Subtraction Wheel (introduced in Unit 2, Module 1, Session 5) 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in this session) 				
Home Connection				
HC 69–70 Puzzles & Shapes				

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

tens*

Preparation

Remove the Unit 1 Work Place Log from the front of each student's Work Place pocket folder, and move the Unit 2 Work Place Log from the back to the front of each folder. Then staple a copy of the Unit 3 Work Place Log at all 4 corners to the back of each student's folder. This will allow students to keep track of the number of times they have visited the Unit 2 Work Places that will remain in use during Unit 3, and also track their progress through the new Work Places as they're introduced in Unit 3.

In today's session, you will introduce Work Place 3A Star Power. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 3A (which replaces 1K, Turn Them Over), using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.

🖄 Work Places

Introducing Work Place 3A Star Power

- 1 Tell students that today they will learn a game that is very similar to Steps & Leaps. Ask students to summarize the rules and procedures for playing Steps & Leaps before you introduce the new game.
 - Display a copy of the 2E Steps & Leaps Record Sheet.
 - Have students talk in pairs to review the rules of the game.
 - Choose a volunteer to share her summary with the class.
- 2 Review how to record moves in Steps & Leaps by rolling two dice and spinning a Leap Tens Spinner.

Work with class input to write down the last number you land on when you take steps of 1, and every number you land on when you leap by 10s.

- 3 Keep the 2E Steps & Leaps Record Sheet on display while you give each student a copy of the 3A Star Power Record Sheet. Have students compare and contrast the two record sheets.
 - Give students a minute to examine the record sheets individually and then pair-share observations.
 - Ask several volunteers to share with the class.
 - Here are some questions you might ask during the discussion:
 - » How are the record sheets alike?
 - » How are they different?
 - » What patterns do students see in the placement of stars?
 - » What do they think the stars are for?
 - » Why might there be a star at the top of the page?

About This Session

What sets Star Power apart from Steps & Leaps is the opportunity to work with powerful properties of addition. By showing students that the order and grouping of steps and leaps doesn't change the final landing spot on the game board, you're giving them concrete examples of the associative and commutative properties in action. Don't be surprised if some students simply want to get to 100 and don't take the time to break up their rolls and spins to optimize their Star Points. It may take some gentle nudging or even a small prize to encourage students to work to win on a different level.



- 4 Introduce Star Power, using a copy of the 3A Star Power Record Sheet, 2 dice, and a Leap Tens Spinner.
 - Explain that this game is different from Steps & Leaps because the players can choose to step and leap in any order.
 - Another difference is that players will work together to land on as many stars as possible while playing. At the end of each game, teams will have Star Points that they can display and compare with other teams.
 - Tell students that they will play the game as a group against you first. Then they will play in pairs. They will see the game again in Work Places.
- 5 Summarize the game.

Players take turns rolling the dice and spinning the spinner to move toward 100. Players write the numbers on all the spaces they land on along the way and circle any stars they land on. The game continues until one of the players reaches or crosses 100 and wins. Then the total number of Star Points are calculated by counting all the stars that are circled. Players add their Star Points and record them on a class score sheet to compare with other teams.

- 6 Ask students to think about what might happen if they can take the steps and leaps in any order. Will that change the number they get to on any given turn? Give them a minute to share their ideas, first in pairs and then as a whole group.
- 7 Then use several copies of the 3A Star Power Record Sheet to model taking steps and leaps for a single turn in several different ways. As you do so, help students discover that the order in which they take steps and leaps in the game will not change where they land in the end.
 - Using the first copy of the record sheet, place a bean on 29. Ask student where the bean game marker is on the board and how they know.
 - Explain that a player is on 29 and has rolled a 2 and a 5 and has spun Leap 3 Tens. Record the information about the hypothetical roll and spin on the board so students can easily access it during the demonstration.
 - Walk through four different combinations of moves to show that the player will always land on 66. Let students know that unlike Steps & Leaps, they have to record every number they land on.

» Use your first copy of the record sheet to demonstrate stepping 2 and 5 first and then leaping 3 tens.

Teacher What happens if the player moves like we did in Steps & Leaps? **Petra** First you take 7 steps because 2 and 5 makes 7. Can I show? That puts you on 36, and you have to write the number in the box.

Teacher Actually, in Star Power, you have to write the numbers in all the boxes you land on, except for the multiples of 10, which you'll circle, like this. OK, now what happens?

Taylor Then you go 3 tens. I'll show, OK? See, 46, 56, 66, and you have to write those numbers in the boxes, like this.



» Use a second copy of the record sheet to step 2, then leap 3 tens, then step 5.

Teacher Let's try the same thing on another record sheet, but we'll take the steps and leaps in a different order. The player still starts on 29, rolls a 5 and a 2, and spins 3 tens. What will happen if we step 2, leap 3 tens, and then step 5? Will we still land on 66? Thumbs up if you think so. Thumbs down if you think we'll land on a different number. Thumbs sideways if you're really not sure. OK, let's try it.

- » Use a third copy of the record sheet to step 5, then leap 3 tens, then step 2.
- » Finally, use a fourth copy of the record sheet to leap 3 tens, then step 2 and 5.

Student We haven't tried leaping first.
Teacher OK, let me get a new record sheet so we can try. Where will the player be if he starts on 29 and leaps forward 3 tens?
Ivan 39, 49, 59. The player will be on 59.
Teacher Now let's step 2 and then 5.

Malika 60, 61. Stepping 2 gets the player to 61.

Shane And going 5 more puts the player on 66. No matter what we do, we are always on 66!

- 8 Explain that the reason players are allowed to use the two rolls and the spin in any order in Star Power is because part of the goal is to land on as many stars (multiples of 10) as possible. Then use several fresh copies of the 3A Star Power Record Sheet to demonstrate.
 - Place a game marker on 46.
 - Tell students that a player has rolled a 4 and a 2 and has spun Leap 1 Ten, and record that information on the board.
 - Ask students to share, first in pairs, and then as a whole group, which order would help the player land on the most stars.
 - Then walk through the different combinations of moves with students' input to show that stepping 4, then leaping 10, and then stepping 2 will earn the player the most Star Points.
- 9 Give each student a bean to use as a game marker and play Star Power against the class, using the Work Place Instructions 3A Star Power Teacher Master as needed.
 - You will need two fresh copies of the 3A Star Power Record Sheet, one for yourself, and one for the class.
 - Have students each write their own name on the 3A Star Power Record Sheet you gave them earlier in the session. Write your name on one of your record sheets, and "the class" on the other.
 - Invite different volunteers to spin, roll, and write on the display record sheet for the class.
 - Students should record each turn the class takes on their own record sheet and use their own marker to keep up with the game play.
 - While you play, model the following behaviors and strategies:
 - » Start your move with the number that will put you on a star if possible. That may mean using the number on one die first or using the leaps on the spinner.
 - » Give students many opportunities to share strategies for collecting the maximum number of Star Points each turn.
 - » Always write the numbers for steps taken on the game boards and circle any stars players land on.
 - When the game is finished, have the students write the total number of star points they
 got in the star at the top right corner of their sheet. Do the same on your record sheet.
 Then work with student input to add up all the star points earned during the game, and
 record the total on the Star Power Team Score Sheet Teacher Master.
- 10 Then assign partners or let students choose their own to play the game in pairs for about 10 minutes.
 - Each student pair will need a pair of dice numbered 1–6, a spinner overlay, and a paper copy of the spinner you have prepared by using the Leap Tens Spinner Teacher Master.
 - Have students use the 3A Star Power Record Sheet on the back side of the sheet you gave them early in the session. Show the class where and how they can access additional double-sided copies of the record sheet if they have time to play more than one game together.
 - Give students time to play in pairs.
 - Circulate to observe student pairs as they play.
 - As pairs finish each game, have them total the Star Points they earned and enter the information on one of the copies of the Star Power Team Score Sheets you have posted.

SUPPORT Some students may still be struggling to count leaps by 10s. Allow students to use a hundreds chart to help them count by 10s, especially when starting with a number that is not a multiple of 10.

ELL Play the game with ELL students, modeling how to play and what to do. Focus on showing students that the key to the game is that they have a choice in the order in which they move.

11 Now reconvene the class and discuss students' suggestions and strategies for getting the maximum number of Star Points.

Have students place any unused or partially used 3A Star Power Record Sheets in their Work Place folders for use later on, either today, or within the next few days during Work Places.

12 Before you send them out to Work Places today, show students that you have stapled a copy of the Unit 3 Work Place Log Teacher Master to the back of each of their Work Place folders, and moved the Unit 2 Log to the front of their folders.

Explain that you will be introducing five new Work Places, all listed on the Unit 3 Work Place Log, by 1s over the next several weeks. This means that students will continue to use some of the most recently introduced Work Places from Unit 2 for awhile, and will need to be able to see both sets listed in order to track how many times they have gone to each. Let them know that when they have used all the Unit 2 Work Places for the last time, you will remove the Unit 2 Work Place Log from the front of their folders, and move the Unit 3 Work Place Log from the back to the front of everyone's folder.

- 13 If time allows, invite students to spend the rest of the session at Work Places.
- 14 Close the session.
 - Have students clean up and put away the Work Place bins.
 - As students are cleaning up, have them practice counting by 10s from various starting points, all off the decade (e.g., 4, 14, 24, 34, 44, and so on; 8, 18, 28, 38, 48, and so on; 13, 23, 33, 43, 53, and so on).

Home Connection

- 15 Introduce and assign the Puzzles & Shapes Home Connection, which provides more practice with the following skills:
 - Fluently add and subtract with sums and minuends to 20 using mental strategies (2.OA.2)
 - Use strategies based on place value, properties of operation, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
 - Solve story problems involving quarters, dimes, nickels, and pennies (2.MD.8)

Session 4 Sticks & Bundles

Summary

Today students work together to estimate and then count a large collection of craft sticks, regrouping the sticks into hundreds, tens, and ones as needed. Then the teacher uses the sticks to pose several double-digit addition problems to the class. Students solve each problem, and then share solutions and strategies. The teacher highlights a strategy that is bound to come from at least some of the students, that of splitting, or first adding the 10s, then the 1s, and then adding the 10s and 1s to get the total. After solving several problems, the students go to Work Places.

Skills & Concepts

- Demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones (2.NBT.1)
- Skip-count by 10s and 100s within 1000 (2.NBT.2)
- Read and write numbers to 1000 represented with numerals (2.NBT.3)
- Use strategies based on place value to add fluently with sums to 100 (2.NBT.5)
- Explain why strategies for adding 2-digit numbers work, using place value and properties of operations (2.NBT.9)
- Construct viable arguments and critique the reasoning of others (2.MP.4)
- Look for and express regularity in repeated reasoning (2.MP.8)

Materials

Copies	Kit Materials	Classroom Materials		
Problems & Investigations Sticks & Bundles				
	 craft sticks (see Preparation) 	 a half-sheet of construction paper or a handkerchief to screen collections of sticks student whiteboards, markers, and erasers (class set) rubber bands (see Preparation) 		
Work Places in Use				
 2A Scoop, Count & Compare (introduced in Unit 2, Module 1, Session 2) 2B The Subtraction Wheel (introduced in Unit 2, Module 1, Session 5) 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 				

3A Star Power (introduced in Unit 3, Module 1, Session 3)

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

Place 500–600 individual craft sticks in a bin and be sure that the sticks are not bundled in any way. There should be enough for each student pair to have between 30 and 40 later in the session. Place about 50 rubber bands in a small container to use for bundling the sticks into groups of 10. Set both containers near your discussion circle for use at the beginning of the session.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

ones*

place value* split strategy tens*

Problems & Investigations

Sticks & Bundles

- 1 Gather students in the discussion area and show them the container of craft sticks that you've prepared. Explain that they're going to estimate and count the number of sticks, and then do some double-digit adding with them.
- 2 Ask students to think silently and then share, first in pairs and then as a whole group, their estimates of how many sticks are in the bin.
 - Record students' estimates on the board.
 - If two or three students give the same estimate, underline the number rather than writing it again.
- 3 Have students pair-share strategies for determining how many craft sticks are in the bin. After a minute or so, invite volunteers to share their ideas with the class.

Students may suggest strategies such as counting each stick, counting by 5s, counting by 10s, or counting by 100s. Acknowledge the strategies shared by students and then guide them toward counting the sticks by 10s.

- 4 Then ask students to help you bundle the sticks into groups of 10.
 - Give each pair of students a handful of sticks (30–40 sticks) and 3–5 rubber bands.
 - Ask each pair to make as many bundles of 10 as they can, wrapping each bundle of 10 with a rubber band.
 - Tell them not to bundle the leftover sticks.

It is not important that students get a specific number of sticks or that all groups get the same number of sticks. In fact, it is better if each pair gets a different number of sticks, and that some sticks are left over after the bundles of 10 are made.

5 Now explain that you need to find out how many sticks there are in all. Ask students to discuss with their partners any ideas they might have for combining and counting their bundles and sticks.

Listen for strategies that begins with counting all the 10s first, and then counting the leftover 1s. If this strategy does not come from students, lead the class toward the idea of counting by 10s and 1s.

6 Choose one student pair to place their bundles and individual sticks in the middle of the discussion circle. Then, have additional pairs add their bundles and sticks as the class counts to determine the new total each time a new collection is added.

This will likely result in an opportunity for students to count by 10s off the decade, as well as opportunities to invite students to complete the 10, or "get to a friendly number," as demonstrated in this interaction.

Teacher Timmy and DJ, would you please put your bundles and sticks in the middle of our circle? How many do you have?
Rachael Two bundles and 3 sticks—that's 23.
Teacher Great! Let's have two more students add bundles and sticks to the collection. How many of each do you have?
Bo We have 3 bundles of 10 and 5 single sticks.

About This Session

The session begins with a counting activity to remind students that bundling objects makes counting more efficient—particularly important when counting large numbers. In this case, students are reminded that sticks can be bundled into groups of 10, and groups of 10 can be combined to make 100. Materials bundled into 10s help students model and develop the splitting strategy for addition, highlighted in the activity that follows. It asks students to progress from adding groups of sticks that are visible to adding groups of sticks that are screened from view. Screening encourages students to begin visualizing numbers by place value as they gradually move away from counting by 10s and 1s to using more sophisticated strategies for double-digit computation.

Teacher OK, I'd like you to add your bundles to the collection in the middle of the circle, one bundle at a time, while we count on from 23 by 10s.

Students and Teacher Thirty-three, 43, 53.

Teacher Alright, now please add your single sticks to the collection, and we'll all count as you do so.

Students and Teacher Fifty-four, 55, 56, 57, 58.

Teacher Well done. Can any of you add some sticks to get to a friendly number?

Amanda Yes! We have 2 sticks and 3 bundles. If we add the sticks first, we can get to 60. Then we can count by regular 10s.

Teacher All right. Go ahead and add your sticks to the collection in the middle of the circle, and then your bundles as we all count together.

Students and Teacher Fifty-nine, 60, 70, 80, 90.

7 Continue in this fashion until about half the students have added their sticks and bundles to the collection. Then invite students to revise their estimates, and remove any from the board that no longer seem reasonable.

Press students to explain their revised estimates, or justify eliminating a particular number from the estimates on the board.

Teacher About half of you have placed your sticks in the center of the circle. Please have a look at the estimates we recorded on the board earlier in the session. Do you see any you think we can get rid of? Does anyone want to give a new estimate, based on the sticks we can see? Cole I think we should cross out the 200 up there. Teacher Why? Cole Because we already have more than 200 sticks on the floor, and some of the kids haven't even put theirs down yet.

Brent I want to change my estimate to 600.

Teacher Why?

Brent Because I think there's about 300 sticks there on the floor, and about half the kids still have to put theirs down.

- 8 When all the students have added their bundles and sticks to the collection, work with their help to group the individual sticks into bundles of 10, and the bundles of 10 into sets of 100 so you can count and confirm the total.
 - After regrouping the sticks, finish the activity by choral counting the 100s, 10s, and 1s. Write the final total on the board.
 - Return to the chart of estimates on the board. Ask students to find the estimate that comes closest to the actual total and circle it.

CHALLENGE Have students find the difference between the closest estimate and the actual number of sticks.

- 9 Next, send students to their seats and introduce the Sticks & Bundles activity, using some of the bundles of 10 students have just counted.
 - Have helpers distribute whiteboards, pens, and erasers.
 - Explain that you're going to work together to add some collections of sticks now.
 - Tell students that in a minute, you're going to ask one of them to bring you 42 sticks. Ask students to pair-share what that collection would look like, and then call on a volunteer to share.

- 10 Ask a volunteer to fetch the 42 sticks and count them with the class to confirm that there are 42. Write 42 on the board, and ask students to do the same on their whiteboards.
- 11 Then ask a volunteer to bring you 25 sticks from the collection and ask students to determine how many sticks there are in all.
 - Confirm with the class that there are 25 in the set.
 - Then set the collection of 42 and the collection of 25 side-by-side.
 - Do not group the 10s and 1s together yet.
 - Write 42 + 25 = ____ on the board, and have students do the same on their individual whiteboards.





- First, have students work toward the answer on their own. Monitor student progress by circulating throughout the room.
- Next, have students pair-share their solutions and strategies.
- 12 Reconvene the class and invite students to share their answers.
 - At this point, do not have students share their strategies.
 - Continue to ask if there are any different answers without revealing the correct answer.

The reason we ask students to share their answers first, without explaining them, is that we often get more than one answer. The fact that there may be 2, 3, or even more solutions on the board, with no signal from the teacher as to which one is correct sets up a genuine need, interest, and curiosity among the students to defend their own solution and listen carefully to the explanations of others.

- 13 When all the different answers are recorded on the board or chart paper, solicit solution strategies from students. Then highlight the splitting strategy.
 - Acknowledge all the strategies shared, which may include variations of a splitting strategy wherein students add the 10s, add the 1s, and then add the 10s and 1s to get the total; jumping by multiples of ten and one on the open number line; counting on by 10s and 1s from 42 (i.e., 42, 52, 62, 63, 64, 65, 66, 67); and possibly counting on by ones from 42.
 - Highlight the splitting strategy by modeling it on the board using a diagram similar to the one shown here.


- 14 Make sure the class agrees that the correct answer is 67, and that each student has written 42 + 25 = 67 on his or her whiteboard.
- 15 Repeat steps 10-14 with the problem 13 + 36.
- 16 Next, begin a new problem: 56 + 43, but screen the first addend from students' view this time.
 - Work with students to count out 56 sticks (5 bundles and 6 sticks), and have students record the number on their whiteboards.
 - Place a piece of construction paper or a cloth over the 56 sticks so that students cannot see them.
 - Then work with the class to count out and display 43 more sticks beside the screened collection.



23



17 Write "56 + 43 =" on the board, as students do the same on their whiteboards. Then have them determine how many sticks there are in all.

SUPPORT If students struggle with the fact that some of the sticks are screened, flash the sticks by removing the screen temporarily and then placing it back on the sticks or simply remove the screen altogether.

- 18 After students have had a minute to work and pair-share solutions and strategies, list their answers on the board. Then invite volunteers to share their strategies with the class.
 - Again, acknowledge all strategies shared, but highlight the splitting strategy by modeling it on the board using a diagram similar to the one shown here.



🖞 Work Places

- 19 Invite students to spend any time that remains in the session at Work Places.
- 20 Close the session.
 - Have students clean up and put away the Work Place bins.

Extension

- During Work Places today or another day soon, invite students working at roughly the same level to play a game called the Wheel of Sticks. For this activity, students work (with a partner if numbers allow) to create 2-digit addition problems for other students to solve. Arrange work spaces (desks, floor space, etc.) in a circle, ensuring that students can move between the work spaces easily. There should be one work space for each student or pair of students.
- Assign each pair of students to a work space and ask them to build with bundles and sticks an addition problem for another pair to solve. For example, a student or a student pair might use 3 bundles and 5 sticks to build 35, and 2 bundles and 3 sticks to build the second number, 23.
- Once all pairs have set up a problem in the work space, have them rotate to the next work space and solve the problem in that work space, working on their whiteboards.
- Next, students must create a new problem, and then prepare to rotate again to solve a problem left by their peers.
- As students complete successive rounds, you can choose to have them create problems that include either one or two screens. You can change the situation for each round. For example, in Round 1, both quantities may be visible. In rounds 2–4, perhaps one number is screened. In round 5, both numbers may be screened.
- Place students, when possible, in appropriate circle groups. Some students may struggle with the screened problems. Therefore, they may be grouped with students at a similar level, in which the group may not use screens at all. When possible group students so that they can experience success with the problem.

Session 5 **Stick Flash**

Summary

During this session, students continue to develop the splitting strategy to add 2-digit numbers within 100. First, the teacher presents a quick images activity, where several different quantities of bundles and sticks are shown for a few seconds, and then hidden as students report how many they saw. After a few examples, the teacher briefly shows two collections of bundles and sticks at the same time, and hides them, asking students to report the total. Then the teacher introduces Work Place 3B Five in a Row, which involves double-digit addition. Finally, the teacher introduces and assigns the Subtracting on the Line & Solving Story Problems Home Connection.

Skills & Concepts

- Fluently add and subtract within 100 using strategies based on place value (2.NBT.5)
- Reason abstractly and quantitatively (2.MP.2)
- Look for and express regularity in repeated reasoning (2.MP.8)

Materials

Copies	Kit Materials	Classroom Materials		
Problems & Investigations Stick Flash				
	 craft sticks, loose and bundled in tens 	 2 screens (9" × 12" sheets of construction paper or cloth handkerchiefs) 2 student whiteboards 		
Work Places Introducing Work P	Work Places Introducing Work Place 3B Five in a Row			
TM T13 Work Place Guide 3B Five in a Row TM T14 Work Place Instructions 3B Five in a Row	 1 deck Five in a Row Cards Five in a Row Game Board 1 set of game markers, 20 red and 20 blue 	 student whiteboards, markers, and erasers (class set) 		
Work Places in Use				
 2B The Subtraction Wheel (introduced in Unit 2, Module 1, Session 5) 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in this session) 				
Home Connection				
HC 71–72 Subtracting on the Line & Solving Story Problems				

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

In today's session, you'll introduce Work Place 3B Five in a Row. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 3B (which replaces 2A, Scoop, Count & Compare), using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

ones* place value* split strategy tens*

Problems & Investigations

Stick Flash

- 1 Gather students in your discussion circle and explain what they will do today.
 - First they will practice reading and adding 2-digit numbers.
 - They will play a flashing game as a class.
 - Next, you will introduce a new Work Place game and then send students out to Work Places.
- 2 Working under a paper or cloth screen, build a 2-digit number by placing some bundles of 10 and single sticks on display. Tell students that you are going to quickly remove the screen and then replace it again and they have to tell you what number they see.
 - When constructing numbers to flash, vary the arrangement of the bundles and single sticks. Organize them in familiar patterns (dice patterns) or randomly, based on groups of 10 and single sticks.



In a Pattern

Randomly

- Do not present more than 5 single sticks. Research has shown that people have difficulty instantly recognizing (subitizing) collections of objects larger than 5 or 6.
- You can vary the quickness of the flash depending on how students are doing with the length of time the sticks are visible. Begin with a two-second flash and adjust the flash time according to how the students respond.
- If necessary, ask students to raise their hand if they need to have a quantity flashed again.
- Ask students to describe what they saw—how many sticks where there in all?
- 3 Repeat step 2 several times with different quantities of bundles and sticks.
- 4 Then hide two groups of sticks and bundles under two whiteboards and ask students to determine how many sticks there are in all.
 - Place 32 sticks (3 bundles of 10 and 2 single sticks) under the first whiteboard and write 32 on top of the whiteboard.
 - Under the second whiteboard, place 25 sticks (2 bundles of 10 and 5 single sticks) under the whiteboard and write 25 on that whiteboard.
 - If students are struggling, you may choose to flash or completely reveal the sticks under one or both of the whiteboards to facilitate the activity.
- 5 Ask students to share their strategies.

About This Session

This session encourages students to move away from relying on physical materials toward visualizing the quantity of numbers by 10s and 1s. The opening activity involves quick visual recognition of several different arrangements of craft sticks. Each arrangement is "flashed" so that students are forced to visualize the quantity and keep track of the 10s and 1s separately. Then the teacher models several addition problems with bundled sticks before screening them from view so that students begin to be able to visualize quantities organized in 10s and 1s.



By presenting the bundles and sticks, you are helping students make the transition from reasoning quantitatively to reasoning abstractly. The bundles still represent the quantities, but by quickly flashing the bundles, you are pressing students to think in terms of 10s and 1s, which strengthens their place value understandings.

Unit 3 Module 1 Session 5

- Pay close attention to students who use a splitting strategy. When it comes up, remind the students that this is the strategy that they were working on in the last session.
- 6 Repeat this activity as many times as you feel necessary.
 - The purpose of this activity is for students to begin using the splitting strategy through visualization of 10s and 1s without needing to see or touch the sticks. Additional problems to model include 43 + 13, 72 + 25, and 50 + 34.
 - You might need to reveal the bundles and single sticks under the whiteboards for students to be able to add the numbers. Quickly flash the sticks and then replace the screens if necessary. Keep in mind that you want students to be able to add the numbers using the splitting strategy without having to see the sticks.

🖄 Work Places

Introducing Work Place 3B Five in a Row

- 7 Introduce Five in a Row by displaying the game board.
 - Ask students to examine the game board, and pair-share observations.
- 8 Then summarize the game.

Players take turns drawing two cards from a deck of 2-digit numbers, adding the two numbers, finding the sum on the game board, and covering it with a game marker. The first player to cover five numbers in a horizontal, vertical, or diagonal row on the game board wins.

- 9 Work with students to set up the game, and let them know that they're going to play as a team against you.
 - Have helpers pass out the whiteboards, pens, and erasers.
 - Keep the Five in a Row Game Board on display where everyone can see it.
 - Have a helper mix the cards and place them in a stack, face-down, where both you and the students have access to them.
 - Separate the game markers into two piles by color, and place them near the game board.
- 10 Play the game once through with the class, using the instructions on the Work Place Instructions 3B Five in a Row Teacher Master as needed.
 - Have a student draw the top two cards in the stack and show them to the class.
 - Have students write the two numbers on their whiteboards, as you do so at the board, and then work with a partner to determine the sum.
 - As students complete the problem, ask volunteers to share their answers.
 - Then invite a few of the students to share their strategies. Take the opportunity to highlight any version of the splitting strategy that comes up, or share it yourself if it doesn't.
 - Once students agree on the answer, have them look for the sum on the game board and cover it with a marker if it is there.
 - Take your turn now, working with input from the students. Use a different colored marker to cover your sum if you find it on the game board.
 - If one team gets a sum that has already been covered by the other team, the second team to get the sum gets to capture it, exchanging the marker for their own. That team gets another turn as well.
 - If the cards run out before one team covers five numbers in a row, reshuffle the discard pile and continue drawing.

- 11 Invite students to spend the rest of the period at Work Places.
- 12 Close the session.
 - Have students clean up and put away the Work Place bins.

Home Connection

- 13 Introduce and assign the Subtracting on the Line & Solving Story Problems Home Connection, which provides more practice with the following skills:
 - Fluently subtract with minuends to 20 using mental strategies (2.OA.2)
 - Model and describe multiplication situations in which sets of equal size are joined (supports 2.OA)
 - Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)
 - Solve money story problems involving dollar bills (2.MD.8)



Teacher Masters

GRADE 2 – UNIT 3 – MODULE 1



Unit 3 Pre-Assessment page 1 of 4

Answer the following questions. Show your work.

1 Bob raced his toy car three times in a row. The car went 10 feet, 12 feet, and 13 feet. How many feet did the toy car travel in all?

DATE

- Mark each distance the car raced on this number line.
- Label the number it ended on.



Bob raced the toy car _____ feet in all.

2 Bambam the kangaroo did the triple jump. She jumped 32 feet, 33 feet, and 35 feet. How many feet did Bambam jump in all?

Mark Bambam's jumps on this number line.

Label the number she ended on.



Bambam jumped _____ feet in all.

(continued on next page)

T1

Unit 3 Pre-Assessment page 2 of 4

NAME

3 Start at 0 and make jumps of 1, 5, and 10 to get up to 47. You have to use at least one jump of each length; you cannot make 47 jumps of 1.

____ Draw your jumps on the number line.

____ Write the length of each jump.

____ Label 47.



4 Juanita counted sticks. Every time she got to 10, she made a bundle with a rubber band. How many sticks does Juanita have in all?



Juanita has ______ sticks in all.

5 Ana has some sticks on the table. She has 23 more sticks under the cloth. How many sticks does Ana have in all? Show your work.



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Ana has ______ sticks in all.
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(continued on next page)

Unit 3 Pre-Assessment page 3 of 4

6 Natasha is 7 years old. Her Aunt Jen is 20 years old. How much older is Aunt Jen? Use the number line to solve the problem.

| DATE



Jen is _____ years older than Natasha.

7 Adam is 10 years old. His grandfather is 78 years old. How much older is his grandfather? Use the number line to solve the problem.



His grandfather is _____ years older than Adam.

8 Sara has three lucky numbers: 21, 37, and 85. Find each of these numbers on the number line and label it to show where each of Sara's three lucky numbers are.



(continued on next page)

Т3

Unit 3 Pre-Assessment page 4 of 4

9 Each big box holds 10 gifts, and single gifts are wrapped with ribbons. How many gifts are there in all in this picture?



There are _____ gifts in all in this picture.

10 Zach's presents are on the table and under it. Bart's presents are in the closet. Who has more presents, Zach or Bart? How many more? Show your work.





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👑 Unit 3 Work Place Log
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T5

| DATE









T7



Summary

The game Star Power is a version of the Steps & Leaps game. Players take turns rolling two dice and spinning the spinner to move toward 100. Players write the numbers on all the spaces they land on along the way and circle any stars they land on. The game continues until one of the players reaches or crosses 100 and wins. Then the total number of Star Points are calculated by counting all of the stars that are circled. Players add their Star Points and record them on a class score sheet to compare with other teams.

Skills & Concepts

- Recall from memory all sums of two 1-digit numbers (2.OA.2)
- Skip-count by 10s within 100 (2.NBT.2)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 100 (2.NBT.5)

Materials

Copies	Kit Materials	Classroom Materials
TM T6 Work Place Guide 3A Star Power TM T7–T8 Work Place Instructions 3A Star Power TM T9 3A Star Power Record Sheet TM T10 Star Power Team Score Sheet	 3 Leap Tens Spinners 6 dice numbered 1–6 	 lima beans or other small objects to serve as game markers

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that	Differentiate	Example
Students are counting by 1s rather than leaping by 10s.	SUPPORT Allow these students to use a hundreds chart to help count by 10s, especially when starting with a number that is not a multiple of ten.	Say a student is on 29 and rolls a 3 and a 4, and spins 2 tens. She decides to take the 3 steps first and lands on 32. She decides to take the 2 leaps of 10 next, but does so by moving her marker one space at a time for 20 spaces, rather than leaping from 32 to 42, and then to 52. Encourage her to use a hundreds chart to help count by 10s off the decade.
One or most students are struggling with the idea of breaking up the steps and leaps effectively.	SUPPORT Meet with these students in small groups, and play the game with them. You might invite 1 or 2 students to play on your team, and 2 or 3 students to play on the opposing team. Be sure students understand that they can take the two numbers they rolled and the number of 10s they spun in any order. Each time you take your turn, share your thinking aloud and work with their input to make your moves.	Suppose you're on 36. You roll a 4 and a 3, and spin Leap 3 10s. Have the students count with you to see that you're 4 steps away from 40. If you land on 40, you can circle the star. Then you can take 3 more leaps of 10, landing on and circling the 50, 60, and 70. From there, you have to take the rest of your steps—3 more.
Some students are very comfortable playing this game, and might benefit from a challenge.	CHALLENGE Have students consider how many Star Points a team of two players could get in a single game. CHALLENGE Pair students working at roughly the same level and invite them to try game variation A. Ask them whether they think this variation will make it possible to land on even more stars, and then have them experiment to find out.	 Ask questions such as: How many stars are on the board? So how many Star Points could one player get in a single game? How many Star Points could a team of two players get in a single game? Is it possible to get that many Star Points? Why or why not? Can you give an example of the rolls and spins a player would need to get the most points possible?

Work Place Instructions 3A Star Power

- 1 Each player needs a record sheet and a game marker. Players share a pair of dice and a spinner.
- 2 Players roll the dice to determine who will go first.
- 3 The first player rolls the dice and spins the spinner one time to see how many steps and leaps he gets to take. The player can take the steps and leaps in any order to get as many Star Points as possible.
- 4 The player writes the numbers on all the spaces he lands on along the way and circles any stars he lands on.



I was on 26. I rolled a 3 and a 4, and then I spun 2 tens. First I used the 4 to get to the nearest star. Then I jumped 2 tens to get two more stars. After that, I had to use up the rest of my steps, so I moved 3 more spaces.

- 5 Players take turns rolling, spinning, and writing on their own record sheets until one player lands on or crosses over 100. That player is the winner.
- 6 At the end of the game, each player counts how many stars she circled and writes this number in the star at the top of her record sheet. These are her Star Points.
- 7 Players add their Star Points together to get a total for their team. Then they write their names and their total points on the Star Power Team Score Sheet posted near the Work Place.
- 8 Players can play the game as many times as they like, using a new record sheet each time. They should write their team's total Star Points on the Team Score Sheet every time they play a game.

(continued on next page)

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T9

Work Place Instructions 3A Star Power

Game Variation

A Instead of using the two numbers rolled and the number of 10s spun in any order, players add the two numbers rolled to get the total number of steps, and then split that total in any way they want. For example, if a player rolls a 3 and a 5, he can add those numbers to get 8, and then split 8 in any way he chooses. If he's on 24, for example, he might use six of the eight steps to get to the nearest multiple of 10. Then he can take the number of leaps of 10 spun, and finally take the last two steps.



| DATE

NAME







Star Power Team Score Sheet

Team (Both Players' Names)	Date	Star Points





Summary

Players take turns drawing two cards from a deck of 2-digit numbers, adding the two numbers, finding the sum on the game board, and covering it with a game marker. The first player to cover five numbers in a horizontal, vertical, or diagonal row on the game board wins.

Skills & Concepts

- Fluently add and subtract within 100 using strategies based on place value (2.NBT.5)
- Reason abstractly and quantitatively (2.MP.2)

Materials

Copies	Kit Materials	Classroom Materials
TM T11 Work Place Guide 3B Five in a Row TM T12 Work Place Instructions 3B Five in a Row	 3 decks of Five in a Row Cards 3 Five in a Row Game Boards 3 sets of game markers, 20 red and 20 blue markers per set 	• student whiteboards, erasers, and markers (6 of each) OR scratch paper

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that	Differentiate	Example
Students are struggling to add the numbers	SUPPORT Allow these students to model the combinations with bundles and sticks. Encourage them to combine and count the bundles and then the individual sticks, regrouping the individual sticks into bundles of 10 when necessary.	The student draws a 37 and a 48. Have her set out 3 bundles and 7 sticks, and 4 bundles and 8 sticks. Then have her count the 10s and then the 1s. When she finds that there are more than 10 individual sticks, have her bundle 10 with a rubber band, and then combine all the 10s and the remaining 1s to find the total.



Work Place Instructions 3B Five in a Row

- 1 This game may be played by an individual, in pairs, or as a competition between two teams. If playing individually, the player needs a Five in a Row Game Board, a deck of Five in a Row Cards, and half a set of game markers. If playing in pairs or as two teams, players need a game board, a deck of cards, and a complete set of game markers to share.
- 2 Players shuffle the cards and place them in a pile face-down. If more than one person is playing, the players each draw a card from the top of the pile and read it to determine its value. The player with the number of greater value goes first. Players bury their cards in the deck.
- 3 The first player draws two cards from the top of the face-down stack and reads the words or numerals, or counts the bundles and sticks pictured to determine the value of each card.



- 4 The player records the addition equation on her whiteboard or piece of scratch paper (for example, 24 + 37 = ____), determines the answer, finishes the equation, and places the two cards in a discard pile.
- 5 Once the player has determined the sum, she searches the game board. If she sees the sum on the game board, she places her colored marker on the number.
- 6 When playing in pairs or as teams, if one player or team gets a sum that is already marked out by the other player, the first player gets to capture that sum, exchange the marker for her own, and take another turn.
- 7 If the cards run out before a player covers five numbers on the game board, players should reshuffle the discard pile and continue playing until someone gets five in a row.



Student Book

GRADE 2 – UNIT 3 – MODULE 1



Hit the Target page 1 of 4

Use skip-jumps on the number line to go from 0 to the circled target number in each problem.

| DATE

- Use the fewest jumps of 1, 5, or 10 possible for each problem.
- You can jump forward or backward, but only by 1, 5, or 10.
- Label your jumps and also the points on the number line where you land.

ex



(continued on next page)

Hit the Target page 2 of 4



(continued on next page)

| DATE

Hit the Target page 3 of 4



| DATE

Challenge Problems

Go from 13 to 27 in as few jumps as possible. Use skip-jumps of 1, 5, or 10. 9



Bridges in Mathematics Grade 2 Student Book SAMPLE VERSION

Hit the Target page 4 of 4

10 Go from 21 to 38 in as few jumps as possible. Use skip-jumps of 1, 5, or 10.



- **11** Make up your own problems on the three blank number lines below. You can start with any number you want, and end with any number you want.
 - Write the starting number under the first mark on the line
 - Write the ending target number in the circle at the end of the line.
 - Go from your starting number to your ending number in as few jumps as possible. Use skip-jumps of 1, 5, or 10.





Home Connections

GRADE 2 – UNIT 3 – MODULE 1



Steps & Leaps page 1 of 6

Note to Families

This Home Connection is a game that students have been playing at school. In Steps & Leaps, players work on separate sheets to try to be first to reach or cross the 100th space. They take turns rolling two dice to determine the number of small steps to take forward and spinning a spinner to leap forward by 10s. As you play, encourage your student to find ways to count by 5s or 10s to move forward on the board.

Materials

- Steps & Leaps pages 1–6
- pencil and paperclip to make a spinner
- 2 dice numbered or dotted 1-6
- 2 small objects (beans, buttons, etc.) for game markers

Instructions

- 1 Give each player a game board (one of pages 3–6) and a game marker. Write your name on your game board and roll the dice to choose which player will go first.
- 2 Have the first player roll the dice and spin the spinner to move around his or her game board.
 - Roll the dice. Move forward that many spaces, and record the number of the square on the space where you land.
 - Spin the spinner on the next page using a pencil and paperclip. Leap forward by that many 10s. Record the numbers of the squares where you land each time you take a leap of 10.



I was on 31. I rolled 11 and stepped to 42. I spun 2 tens, so I took 2 jumps by 10s and landed on 52 and 62.

- 3 After the steps and leaps are recorded, the other player rolls, spins, and records their steps and leaps on their own game board. The first player to reach or cross over 100 is the winner.
- 4 Using the other two game boards, play the game again. Then complete the problems on page 2 and return this sheet to school.

(continued on next page)

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Steps & Leaps page 2 of 6



Count by 10s to fill in the blanks.

1	10, 20,,	, 50,, 70,,	90,	
2	14, 24,,	, 54,, 74,,	94,, 114, 124	
3	26,,, 56	, 66,,,,	, 106,,	_
4	CHALLENGE,	,,,,	, 99,,	_,,
5	Add to solve each con 43 + 10 = 24 + 20 =	mbination below. 56 + 10 = 21 + 20 =	87 + 10 = 45 + 30 =	72 + 10 =
6	Subtract to solve each 15 – 10 = 56 – 20 =	n combination below. 19 – 10 = 88 – 30 =	23 – 10 = 97 + 40 =	34 - 20 =
7	CHALLENGE Solve the $120 + 50 + 20 - 40 = -$ 500 - 50 - 40 - 20 + 120 = -	equations below. 20 =	330 - 20 + 50 - 60 = _	

(continued on next page)

Steps & Leaps page 3 of 6



Steps & Leaps page 4 of 6



Steps & Leaps page 5 of 6



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Steps & Leaps page 6 of 6


Puzzles & Shapes page 1 of 2

1 Fill in the missing numbers to solve these equations. Use the pictures to help.

| DATE



2 Fill in the missing numbers to solve these equations.



3 **CHALLENGE** Fill in the missing numbers to solve these equations.

90 - 30 = 20 + _____ 143 - 11 = 127 + ____ 160 - 18 = _____ + 15

(continued on next page)

NAME

Puzzles & Shapes page 2 of 2



4 How much does this shape picture cost? Circle the coins you could use to pay for it.



5 Draw a vehicle (car, boat, truck, plane, scooter, bike, skateboard) that costs 75¢. Label your picture with the prices. Add the numbers to check your work.



а

14 – 7 = _____

Subtracting on the Line & Solving Story Problems page 1 of 2

| DATE

DJ Hopper says you can use what you know about making 10 to help subtract.

If the fact is 15 - 8, you can think about making 10 (8 + 2 = 10) and then adding 5 more to get to 15. DJ likes to show his work on the number line, like this.



1 Make hops on the number line and label them to solve subtraction problems.



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Subtracting on the Line & Solving Story Problems page 2 of 2

2 Jose, Matt, and Dani went to the library. They each checked out 5 books. How many books is that in all? Show your work.



Jose, Matt, and Dani checked out _____ books in all.

- **3 CHALLENGE** Show your work on each problem. Four granola bars cost \$2.00.
 - **a** How much does 1 granola bar cost? _____

b How much do 2 granola bars cost? _____



C How much do 5 granola bars cost? _____





Digital Resources

GRADE 2 – UNIT 3 – MODULE 1



Unit 3 Module 1 Digital Resources

These resources, selected from the curated collection at the Bridges Educator site, can be used to extend instruction and support students during this module.

Apps by The Math Learning Center

Number Pieces

This app allows students to manipulate base ten pieces and write on the screen. One advantage to these virtual base ten pieces is that students can group units to make strips, and strips to make mats—something not possible with physical base ten pieces. You might make the Number Pieces Basic app available to students to use in modeling and solving the story problems posed throughout the unit, especially in activities that involve physical sticks and bundles or base ten pieces.

catalog.mathlearningcenter.org/apps/number-pieces

Additional Resources

Techno Tortoise

The Techno Tortoise Demonstrator shows a tortoise positioned at 0 along a number line marked in tens and ones. Each multiple of 10 through 120 is numbered. You can move the tortoise along the line in jumps of 1, 5, and 10 going forward, and jumps of 1 or 10 going backward. You might use this online tool to model the examples in Module 1, Session 2.

www.ictgames.com/technowithflock.html

Base Ten

If some of your students need practice using base ten pieces to build different 2- and 3-digit numbers, consider having them use the online Base Ten activity. This web-based activity shows different 2- or 3-digit numbers out of sequence and invites students to build each using units, strips, and mats. As they add pieces to their collection, a number line at the bottom of the screen shows the total, supporting students learning to read and understand numbers to 100 or 1,000. The activity also encourages students to move from one quantity to the next, adding to or subtracting from their collection of pieces, rather than clearing the screen each time.

www.learningbox.com/Base10/BaseTen.html

Saucer Sorter

Count numbers in any sequence (counting by 2s, 5s, and more) up to 200. The teacher tool allows you to cover numbers or move numbers around in a given sequence.

www.ictgames.com/saucerSorter.html

Connect the Dots: Multiples

In these connect the dot pictures, players set the counting sequence. Set the pictures to practice counting by 1s, 5s, 10s, or set your own number to practice multiples. This individual activity might be used to support students who are still learning to count fluently by 10s.

www.abcya.com/super_connect_the_dots_kids_game.htm





Virtual Manipulatives

Additional apps, including the Number Rack, Number Line, and Geoboards, are available free from the Math Learning Center for web, iOS and other platforms.

Math Vocabulary Cards

The Math Vocabulary Cards app (available for web and iOS) helps students deepen their conceptual understanding of key terms in mathematics. Each card features a math term, a representative example or model, and a concise definition.

Bridges Educator Site Resources

The following resources are available to Bridges classrooms at the Bridges Educator site.

Interactive Whiteboard Files

Interactive whiteboard files in SMART Notebook and IWB formats for the teacher masters in each module.

Family Overviews

Brief overviews of each Bridges unit, designed to be sent home to families. Available in English and Spanish.

Support & Intervention

Targeted instruction and support, addressing Tier 2 within the Response to Intervention framework. Each volume contains activities, games, and practice pages that can be used for reteaching, practice, and progress monitoring.



Teachers Guide

GRADE 2 – UNIT 3 – MODULE 2



Module 2 Adding & Subtracting on the Number Line

Session 1	How Much Older?	3
Session 2	Solving Problems on the Open Number Line	.7
Session 3	Height & Length Problems	13
Session 4	Introducing Work Place 3C Hit the Zone	19
Session 5	Addition & Subtraction Checkpoint	23

Teacher Masters

Pages renumber with each module.	
The Jimenez Family	T1
Comparing Ages	T2
Open Number Line Problems	T3
David's Problem	T4
Work Place Guide 3C Hit the Zone	T5
Work Place Instructions 3C Hit the Zone	T6
3C Hit the Zone Record Sheet	T7
3C Hit the Zone Blank Game Board	T8
3C Hit the Zone Blank Triple Spinners	T9
Addition & Subtraction Checkpoint	T10

Student Book Pages

Page numbers correspond to those in the consumable books.	
Open Number Line Record Sheet	. 37
Length Problems on the Open Number Line	.38
3C Hit the Zone Record Sheet	.39

Home Connections Pages

Page numbers correspond to those in the consumable books.
Family Age Number Line73
Adding, Counting & Solving Problems75

Digital Resources	5 D1
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Module 2 Adding & Subtracting on the Number Line

Overview

In this module, students develop facility with the number line as a model for addition and subtraction within the range of 0 to 100. Additionally, students are asked to model, and sub-sequently solve, story problems that require either addition or subtraction with double-digit numbers. Students are encouraged to develop confidence with the "skip-jump" strategy by moving in both directions on the number line by increments of 1, 5, and 10.

Planner

Session & Work Places	P&I	WP	Α	НС
Session 1 How Much Older? Students use the number line to add and subtract within the range of 0 to 100. Specific focus is placed on subtraction as students compare the ages of family members in story problem contexts.	•	•		
Session 2 Solving Problems on the Open Number Line In this session, students use the open number line to model and solve three double-digit story problems. Students move from counting by ones to making jumps of 10 on the open number line. The session ends with a visit to Work Places if time allows. Finally, the teacher introduces and assigns the Family Age Number Line Home Connection.	•	•		•
Session 3 Height & Length Problems Students work as a group with the teacher to compare and contrast three differ- ent solutions to a story problem involving length using the open number line. Students then work in pairs or individually to solve two related story problems using the open number line. Students do Work Places as they finish and then come back together as a class to discuss solutions.	•	•		
Session 4 Introducing Work Place 3C Hit the Zone The teacher introduces a new Work Place game featuring subtraction on the number line, by playing against the class and having students track all the moves and results for their team in their Student Books. Then the teacher sends students out to do Work Places, including the one just introduced. Finally, the teacher introduces and assigns the Adding, Counting & Solving Problems Home Connection.		•		•
Introducing Work Place 3C Hit the Zone Each player begins by writing his initials at the top of the game board to claim one of four lines that run the length of the board. Next, players take turns rolling a die to determine which of six zones on the board they need to reach in order to win. Players then take turns spinning a numbered spinner that determines how far they can move along their line. After three spins each, using a different spinner each time, the player who comes closest to hitting his or her designated zone wins the round.				
Session 5 Addition & Subtraction Checkpoint This session provides a checkpoint for much of the content covered in the first two modules of Unit 3. Students locate, mark, and identify numbers on a line, use the open number line to model and solve double-digit subtraction prob- lems, use the fewest skip-jumps of 1, 5, and 10 to reach different points on the number line, and solve several double-digit addition problems. When finished with the assessment, students turn in their work and go out to Work Places.		•	•	

P&I - Problems & Investigations, WP - Work Place, A - Assessment, HC - Home Connection

Materials Preparation

Each session includes a complete list of the materials you'll need to conduct the session, as well as notes about any preparation you'll need to do in advance. If you would like to prepare materials ahead of time for the entire module, you can use this to-do list.

Task		Done						
Copies	Run copies of Teacher Masters T1–T12 according to the instructions at the top of each master.							
	Run a single copy of Student Book page 37.							
	If students do not have their own Student Books, run a class set of Student Book pages 36–38.							
	If students do not have their own Home Connections books, run a class set of Home Connections pages 73–76.							
Work Place Preparation	Prepare the materials for Work Place 3C using the list of materials on the Work Place Guide (Teacher Master T5).							
Paper Cutting	Cut an 18-inch length of adding machine tape for each student to use in completing the Home Connection for Session 2.							
Special Items	Prepare several baskets of craft sticks bundled into sets of 10, as well as indi- vidual sticks for students who want to use these tools during the assessment.							



Please see the Resources section at the end of this module for a collection of resources you can use with students to supplement your instruction.

Session 1 How Much Older?

Summary

Students use the number line to add and subtract within the range of 0 to 100. Specific focus is placed on subtraction as students compare the ages of family members in story problem contexts.

Skills & Concepts

- Solve one-step subtraction story problems with minuends to 100 involving situations of comparing, with unknowns in all positions (2.OA.1)
- Skip-count by 5s and 10s within 1000 (2.NBT.2)
- Represent whole numbers as lengths on a number line (2.MD.6)
- Represent whole number differences from minuends up to 100 on a number line (2.MD.6)
- Model with mathematics (2.MP.4)
- Use appropriate tools strategically (2.MP.5)

Materials

Copies	Kit Materials	Classroom Materials							
Problems & Investigations How Much Older?									
TM T1 The Jimenez Family TM T2 Comparing Ages		 student whiteboards, markers, and erasers (class set) a piece of copy paper to mask portions of the teacher master 							
Work Places in Use									
 2B The Subtraction Wheel (in 2C Number Line Race (introdu 2D Pick 2, Roll & Subtract (introduced 2E Steps & Leaps (introduced in 3B Five in a Row (introduced 	troduced in Unit 2, Module 1, So uced in Unit 2, Module 2, Sessio roduced in Unit 2, Module 2, Se in Unit 2, Module 3, Session 3) Unit 3, Module 1, Session 3) Unit 3, Module 1, Session 5)	ession 5) n 1) ssion 4)							

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Problems & Investigations

How Much Older?

- 1 Gather students to your discussion circle and let them know that they will do some subtraction on the number line today, using people's ages as a context.
- 2 Engage students in discussion about the ages of some of the people in their family. As students share, list 10–15 of the ages they mention on the board. The following discussion prompts may be helpful.
 - How many years old is the oldest person that you know?
 - Who is the youngest person that you know?
 - How old is your mom or your dad?

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* difference* subtract* 3 Draw an open number line on the board. Mark and label 0 at the left end. Work with input from the students to mark and label 8–10 of the numbers you just listed on the board, starting with the greatest to help establish the scale of the number line.

The following prompts may help guide discussion.

- You said your great grandmother is 98 years old! Where should we put that number on our number line?
- Some of you disagree on where the number 98 should be placed. Is there one exact place where we have to put 98?
- If we want to also include some other numbers on our number line, how far away from 0 should we place 98?

Although the age of the oldest person on your list could go anywhere to the right of 0, talk with students about the wisdom of leaving ample space between 0 and that number to fit additional numbers on the number line. If students suggest a location that is too close to 0 to be able to easily place a wide range of numbers on the line, follow up by asking them to put their own age on the number line. If they struggle to do so, it will motivate the need for a larger scale on the number line.

- 4 Then display the Jimenez Family Teacher Master, give students a few moments to examine the information quietly, and then ask students to mark the age of each person in the family on the number line.
 - Read the instructions at the top of the page with the class.
 - As you choose each student, have him or her come up to the display and make a mark along the number line for one of the Jimenez family members, using the multiples of 5 as anchor points.
 - Label each mark with the family member's name.



5 Next, discuss the display with the class, noting in particular the various ages of the family members.

Here are some questions you may want to pose:

- How many people are in this family? (10 people)
- Who is the oldest member of the family? How old is Grandma Jimenez? (Grandma Jimenez, 80 years old)
- Who is the youngest member of the family? How old is Carlos? (Carlos, 6 years old)
- Who is older, Nick or Maria? (Maria)
- Who is older in the Jimenez family, Mom or Dad? (Dad)

About This Session

Here, students return to the idea of subtraction as a process of finding the difference between two quantities rather than taking one quantity away from another. Within this framework, it's likely that students will begin with the subtrahend (the smaller number) and actually "count up" to arrive at the minuend (larger number). Throughout the session, students will be invited to find the difference between two numbers going in both directions—building from the subtrahend to the minuend, as well as starting with the minuend and subtracting toward the subtrahend.

- 6 Now explain that you are going to pose some problems about the differences in ages between some of the members of the Jimenez family. Start by displaying just the first number line, labeled The Jimenez Children on the Comparing Ages Teacher Master. Keep the other two number lines on the teacher master covered for now.
 - Have helpers distribute whiteboards, pens, and erasers to all the students.
 - Pose the following problem to the class regarding the information on the first number line: Ana is older than Carlos. How much older? (3 years older)



- » Ask students to use labeled sketches and numbers on their whiteboards to find the answer.
- » Give students a minute to solve it on their boards.
- » Have students share, first in pairs and then as a whole group, their solutions and strategies.
- » Record students' thinking on the board, making use of the open number line, as does the teacher in this dialog.

Teacher How much older is Ana than Carlos, everyone?

Students Three! Three years older.

Teacher It sounds like everyone agrees that Ana is three years older than Carlos. Would someone be willing to show us how they figured it out?

Maya I just knew it was 3 because 6 + 3 = 9.

Brent I counted up from 6. I went 7, 8, 9, so I knew it was 3.

Teacher I'm going to use the open number line to show your thinking. Maya said she added 3 to 6 to get 9. I'll show that by taking a hop of 3 from the 6 up to the 9. Then DJ said he counted up by 1s from 6. I'm going to show that by making 3 hops of 1, and labeling each of them.



- 7 Next, pose the additional problems listed here regarding the Jimenez children. Continue to model students' responses on the board. Guide them toward using hops of 1, 5, or 10 on an open number line to model and solve the problems.
 - Nicholas is older than Ana. How much older? (6 years older)

Once you have modeled a couple of the problems using hops on the open number line, look for students to do the same thing on their whiteboards. Model jumps in both directions so students understand that a subtraction problem, when thought of as the difference

Tools for Modeling Mathematics

Show labeled jumps of any size with the Number Line Jump Maker. You can use this simple online tool to model students' thinking from step 6 through 9 instead of, or in addition to, drawing on the teacher master. For example, once you've asked students to figure out how many years older Ana is than Carlos, you can set the slider on the Number Line Jump Maker to 6, and easily model 3 jumps of 1 and 1 jump of 3 to confirm and model students' responses.

This and other resources are listed in the Resources section at the end of the module.

between two numbers, can be solved by either adding up (from the subtrahend), or taking away (from the minuend).



- Nicholas and Carlos are brothers. Nicholas is older. How much older? (9 years older)
- Maria is older than Carlos. How much older? (14 years older)
- 8 Then display the second line, labeled The Jimenez Grandparents on the Comparing Ages Teacher Master, keeping the third line covered. Pose the problems listed here regarding the Jimenez grandparents.
 - How much older is Grandma than Grandpa? (5 years)
 - Grandma always said she wanted to live to be 100 years old. How many more years is that? (20 years)
 - How old will Grandpa be 10 years from now? (85 years old)
 - How old was Grandma 6 years ago? (74 years old)
 - » Give students a minute to solve each and pair-share their solutions and strategies.
 - » Ask students to share their answers as a whole class.
 - » Invite volunteers to share their strategies with the class. Choose students who have modeled and solved the problem on an open number line, using forward or backward hops of 1s, 5s, or 10s.
- 9 Finally, display the third line, labeled The Jimenez Adults on the Comparing Ages Teacher Master. Pose the problems listed here regarding the Jimenez adults.
 - Grandpa is older than Dad. How much older? (20 years older)
 - Dad is older than Mom. How much older? (6 years older)
 - Aunt Elsa is older than Uncle Leo. How much older? (12 years older)
 - Dad is older than Uncle Leo. How much older? (27 years older)
 - How old was Uncle Leo 9 years ago? (19 years old)
 - How many years from now will Mom be 100 years old? (51 years)

Work Places

- 10 Invite students to spend any time that remains in the session at Work Places.
- 11 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Display the Jimenez Family Teacher Master again.
 - Ask for a volunteer to point to the place where he or she would be on the number line, and mark the location.

Session 2 Solving Problems on the Open Number Line

Summary

In this session, students use the open number line to model and solve three double-digit story problems. The teacher presents the first problem to the entire class and uses it to illustrate how counting by 1s on the open number line is an accurate, but inefficient strategy. Then the class works together to group the jumps of one into larger groups of 10 to find the solution and to find their own ways of getting from 38 to 75 on an open number line. After this group work, students work in pairs to solve two more problems presented to the whole class. The session ends with a visit to Work Places if time allows. Finally, the teacher introduces and assigns the Family Age Number Line Home Connection.

Skills & Concepts

- Solve one-step addition story problems with sums to 100 involving situations of adding to, with unknowns in all positions (2.OA.1)
- Solve one-step subtraction story problems with minuends to 100 involving situations of comparing, with unknowns in all positions (2.OA.1)
- Represent whole-number sums and differences within 100 on a number line (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Construct viable arguments and critique the reasoning of others (2.MP.3)

Materials

Copies	Kit Materials	Classroom Materials							
Problems & Investigations Solving Problems on the Open Number Line									
TM T3 Open Number Line Problems SB 37 Open Number Line Record Sheet		 a piece of paper to mask portions of the display 							
Work Places in Use									
 2B The Subtraction Wheel (introd 2C Number Line Race (introduced 2D Pick 2, Roll & Subtract (introdu 2E Steps & Leaps (introduced in Uit 3A Star Power (introduced in Unit 3B Five in a Row (introduced in Uit 	uced in Unit 2, Module 1, Sessio in Unit 2, Module 2, Session 1) ced in Unit 2, Module 2, Session nit 2, Module 3, Session 3) 3, Module 1, Session 3) nit 3, Module 1, Session 5)	n 5) 4)							
Home Connection									
HC 73–74 Family Age Number Line	 adding machine tape (see Preparation) 	 a paperclip for each student 							

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

Cut an 18-inch length of adding machine tape for each student to use in completing the Home Connection.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

open number line

Problems & Investigations

Solving Problems on the Open Number Line

1 Display the first problem on the Open Number Line Problems Teacher Master and read it with the class. Explain that today students will use open numbers lines to solve problems like this one.

Unit 3 Module 2 Session 2 1 copy for display
Open Number Line Problems
1 Josh and his dad are driving to the city. It is 75 miles away. They have already gone 38 miles. How many more miles do they have to drive?

2 Ask students to share, first in pairs and then as a whole group, ideas about what the problem is asking, and how they would go about solving it.

Be sure that the ideas of counting on from, or adding to 38 to reach 75, and counting backward from 75 to find out how many miles remain are discussed. Summarize both approaches by writing equations.

Amanda You have to figure out how much farther they have to drive. You could keep going, like count up from 38 to 75.

Teacher I wrote 38 + box equals 75 to show that idea. What does the box mean in this equation?

38 + = 75

Brent It means the part you have to figure out. It's where you write the answer.

Cole It's like the problem you have to solve. 38 plus how many more to get to 75?

Teacher Yep. So, does anyone have any other ideas about how we might solve this problem?

Devon You could go maybe go backward from 75 down to 38.

Teacher OK. Let's write an equation to represent your idea, Damien.



- 3 Draw an open number line on which to model the problem. Mark 38 at one end and 75 at the other. Then propose to solve the problem by making hops of 1 all the way from 38 to 75.
 - Give students time to discuss the idea, and then model it.

While this process is almost painfully tedious, it serves several purposes. The first is to honor students who are still counting by 1s. The second is to set the stage for grouping the single hops by 10s, with all students fully cognizant of where they came from. The third is to encourage students to work efficiently rather than relying on a process that has worked in the past, but is becoming fast outmoded as the numbers get bigger.

Tools for Modeling Mathematics

Consider using the online Number Line Jump Maker to model computation starting in step 3. This tool allows you to make labeled jumps of any size more easily. The jumps will also be more uniform and more easily read than when drawing them on the board. You can show jumps of different sizes simultaneously by clicking on the start point a second time and making a jump of a different size.

This and other resources are listed in the Resources section at the end of the module. Sean But you could go faster if you made bigger hops. Like, you could just take a hop of 2 and get to 40, and then you could go by 10s.

Teacher That's true, but let's try it this way and see what happens. I need you all to help me. I'm going to make a hop and label it with a +1 each time until we get all the way to 75. Ready?

Students Thirty-nine, 40, 41, 42, 43, 44 [...] 75!

Sean That took forever!

Teacher Let's go back and label the places we landed along the line. I need your help again with this job.

Students Thirty-nine, 40, 41, 42, 43, 44 [...] 75!

	+	\sim	\vee	$\overset{ }{\sim}$	\sim	\sim	\sim	\sim	$\bigvee^{ _+}$	\sim	$\checkmark^{ +}$	\sim	$\overset{ _{+}}{\checkmark}$	\sim	\sim	$\bigvee^{ +}$	$\bigvee^{ +}$	$ _+$	$ _+$	$ _+$	$ _+$	$\stackrel{ _{+}}{\checkmark}$	$ _+$	$\overset{ _{+}}{\checkmark}$	$\stackrel{ _{+}}{\checkmark}$	$\stackrel{ _{+}}{\checkmark}$	 \											
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	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75

4 Now ask students how many hops it took to go from 38 to 75. After some discussion, go back and loop the single hops into groups of 10 to make them easier to count.

Teacher Whew! That was a lot of work. So, how many more miles do Josh and his dad have to drive to get to the city?

Carlos We don't know. There's just a bunch of hops, but we don't even know the answer!

Monique Now we have to go back and count how many hops there are!

Chase It's 37. I already counted them.

Teacher I have an idea. Max says it's 37; Danielle says we have to go back and count them to be sure. What if we count the hops by 10s, instead of 1s, like this?



Teacher Now that we've got 10, 20, 30, do we need more? Shane Yes, we didn't make it all the way to 75 yet. Carlos There are 7 jumps left. See, it did turn out to be 37. Tristan Can I circle them?

- 5 Then read the problem aloud again, have students pair-share answers, using the information on the board, and then state the answer aloud on your signal.
- 6 Next, draw a new number line on the board, labeled with 38 at one end and 75 at the other, and ask students how they might solve the problem if they could take hops greater than 1.
- 7 Have students share ideas, first in pairs, and then with the whole group. Invite a couple of volunteers to explain their ideas to the class as you work at the board to draw them.
 - Draw and label a new line for each strategy shared.



CHALLENGE Some students may be ready to consider a strategy that has them taking one long jump past 75 to 78 and then jumping back 3. Draw an open number line showing one long jump of 40 from 38 to 78 and then a jump back to 75. Discuss how this number line models the situation and encourage students to write an equation to match.

- 8 Discuss the strategies students have shared, in terms of the original problem. Here are some questions you might ask:
 - How much farther did Josh and his dad have to drive to get to the city?
 - How do you know? Can you show us on the open number line?
 - Does this give us the answer to the problem?
 - Did we add or subtract to find the answer?

Shawn They had to go 37 more miles because if you add up all the hops, it's 10, 20, 30, then 32 plus 5, and that's 37.

Jamal It's right because 38 and 37 really is 75, I checked it.

Ana I don't get it, Jamal. Why are we adding when it should be take away?

Tristan You can add to find the answer to a subtraction problem, like 14 - 7 is 7 because 7 + 7 is 14.

Elisa Also, the problem is kind of like adding. You have to find out how much more they need to go, right?

9 Ask students to find the Open Number Line Record Sheet page in their Student Books, and solve problem 1. Have them use one of the strategies (other than hopping by 1s) on the board, or generate yet another on their own.

Ask students to:

- Record the two equations from the board at the top of the first box.
- Show how they would make hops to get from 38 to 75 on the number line.
- Label their work.
- 10 Then display the second story problem on the Open Number Line Problems Teacher Master and read it with the class.
 - Ask students to share, first in pairs and then as a whole group, ideas about what the problem is asking, and how they would go about solving it.
 - Then work with students' input to record on the board two different equations to match the situation, as they do so in their Student Books.

Math Practices in Action 2.MP.3

By asking students to reflect upon the variety of strategies they have shared, you are helping them learn to construct viable arguments and critique the reasoning of others. In the process, they are developing greater fluency with multi-digit computation strategies. **2** Maria Jose wants to buy a bike that costs 72 dollars. So far, she has saved 26 dollars. How much more money does she need to save?

11 Leave the problem on display and have students work in pairs to solve it in their Student Books. Remind them to label their work.

As you circulate and talk to students about their work, take note of the different strategies students are using. Look for pairs using efficient strategies to share their work in the next step. **SUPPORT** If you find students continuing to count by 1s, let them mark 10 or even 20 small steps. Then stop them, and ask them to loop their hops of 1 into groups of 10. You may have to do this more than once, but it's important to start where students are, and help them work from their current strategies to methods that are more efficient.

12 Draw several open number lines on the board, and ask three different pairs of students to come up to the board to share and explain their work.



13 Repeat steps 10 through 12 with the last story problem on the teacher master. Give students time to share answers.

Work Places

- 14 Invite students to spend any time that remains in the session at Work Places.
- 15 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Draw an open number line with 33 and 81 marked. Ask students to think of equations to represent the display and offer possible ways to solve the equations.

Home Connection

- 16 Introduce and assign the Family Age Number Line Home Connection, which provides more practice with the following skills:
 - Solve one-step addition story problems with sums to 100 involving situations of adding to, with unknowns in all positions (2.OA.1)
 - Solve one-step subtraction story problems with minuends to 100 involving situations of comparing, with unknowns in all positions (2.OA.1)
 - Represent whole numbers as lengths on a number line (2.MD.6)
 - Represent whole-number sums and differences within 100 on a number line (2.MD.6)
- 17 Review this assignment carefully before sending it home with students.
 - Give them each an 18-inch length of adding machine tape to use for the first part of the assignment.
 - Have them fold the strip in half and then half again, and paperclip it to the assignment.

Session 3 Height & Length Problems

Summary

Students work as a group with the teacher to compare and contrast three different solutions to a story problem involving length. The discussion of the different solutions gives the class another opportunity to observe and discuss methods of using the open number line to solve problems. Students then work in pairs or individually to solve two related story problems using the open number line. Students go out to Work Places as they finish and then come back together as a class to discuss solutions.

Skills & Concepts

- Solve one-step subtraction story problems with minuends to 100 involving situations of comparing, with unknowns in all positions (2.OA.1)
- Measure the length of an object in inches using a measuring tape (2.MD.1)
- Estimate length in inches (2.MD.3)
- Determine exactly how much longer one object is than another (2.MD.4)
- Express the difference between two lengths in terms of a standard unit of length (2.MD.4)
- Solve subtraction story problems with minuends to 100 involving lengths given in the same units (2.MD.5)
- Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Construct viable arguments and critique the reasoning of others (2.MP.3)

Materials

Copies	Kit Materials	Classroom Materials							
Problems & Investigations Height & Length Problems									
TM T4 David's Problem SB 38* Length Problems on the Open Number Line	 measuring tape marked in inches 	 a piece of paper to mask portions of the overhead student whiteboards, markers, and erasers (class set) 							
Work Places in Use									
 2B The Subtraction Wheel (int 2C Number Line Race (introdu 2D Pick 2, Roll & Subtract (intro 2E Steps & Leaps (introduced i 3A Star Power (introduced in L 3B Five in a Row (introduced in 	roduced in Unit 2, Module 1, Ses ced in Unit 2, Module 2, Session oduced in Unit 2, Module 2, Sess in Unit 2, Module 3, Session 3) Jnit 3, Module 1, Session 3) in Unit 3, Module 1, Session 5)	sion 5) 1) ion 4)							

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

*Run 1 copy of this page for display.



Vocabulary An asterisk [*] identifies those terms for which Word Resource Cards are available.

difference* height* length*

Problems & Investigations

Height & Length Problems

1 Explain that students will be thinking about problems of height and length today. Ask the what they know about the words *height* and *length*.

What do you know about those two words? Have you ever measured the length of something? If so, what units did you use? Have you ever measured the height of something? Has anyone ever measured your height? If so, in what units?

2 Display the problem at the top of David's Problem Teacher Master, keeping the rest of the sheet covered for now. Read the problem out loud and ask students to think about what it is asking.

Also, have students think about the heights of the two boys mentioned in the problem. Which one of the two, David or Matt, is probably closer to them in height? Is Matt quite a bit taller than David, or just a little? How old do they think these two boys might be?

Unit 3 Module 2	Session 3 1 copy for display
Davi	id's Problem
David is 49	inches tall. His big brother, Matt, is 76 inches tall. How many inches will
David have	to grow to be as tall as his big brother?

3 Then have students help you measure and mark both heights, 49 and 76 inches, on the board using the measuring tape.



4 Ask students to work in pairs to estimate how many inches David will have to grow to catch up with his brother. Have a few volunteers share their estimates with the class.

Student A If David grew 10 inches, he would be up to 59.
Student B It's more than 20 because 49 + 20 is only 69.
Student C I agree with you, Sergio. I think it's close to 25. 49 is close to 50 and 50 plus 25 is 75.

About This Session

Even though second graders haven't yet had formal instruction in measuring with standard units, many, if not most, have encountered the idea outside of school. Some might keep an ongoing record of their height at home or know the length of a new baby in the family. This session poses problems in the context of such familiar situations and may be regarded as an informal lead-in to Unit 4, when students will learn more about measuring in U.S. customary units (inches, feet, and yards).

5 Work with students' input to write two different equations on the teacher master to represent the situation.



Teacher I think we all agree that this problem is asking us to figure out how many inches David has to grow to catch up with Matt. What equations can we write that will show what we have to do?

Tasha We have to go up from 49 to 76, so we could do one like 49 plus box equals 76.

Nikki What does the box mean again, Tasha?

Tasha It is the number we don't know. The equation says we need to take 49 and add a number to it to get 76.

Teacher Any other ideas? Would it work if we went the other way? What about 76 minus box equals 49?

Noah I think it would be the same. It's like you are on 76 and you jump down some to get to 49.

Hannah It's still the same number of inches between David and Matt, whether you go up or down.

6 Explain that you are going to show some solutions to David's problem from other second graders. Reveal the first solution, give students a few moments to study it quietly, and then discuss the work.



Megan That kid hopped 1 to get to 50. Then he went 10 more and 10 more to get up to 70. Then he took a big hop of 6 to get to 76.

Zachary So how do we use that to find the answer? It's just a bunch of hops?

Serge You can add the hops together to figure it out. One plus 10 plus 10 plus 6 equals 27.

Ariel David needs to grow 27 inches to be as tall as his brother.

- 7 Next, ask students to record solution 1 on their whiteboards and add the results.
 - Give students each a whiteboard, pen, and an eraser.
 - Record the length of each of the hops from Solution 1 on the board as students do so on their whiteboards.
 - Then give the class a few moments to add the numbers and report the results.
 - Press them to explain how this equation relates to David's problem.

Teacher Please tell the person next to you what you got when you added 1 + 10 + 10 + 6. OK, now you can all tell me when I clap once. **Students** 27! **Teacher** What does 27 have to do with David's problem? **Sam** That's how many inches David has to grow to catch up with his brother. Rosa That's a lot of inches, I think. Matt is pretty tall. He's probably in high school or something. Teacher Where did those numbers even come from? Amanda Lynn Those are the numbers from the hops that kid made. They show how far it is from 49 to 76.

8 Reveal each of the other two solutions, one at a time. In each case, ask students to write an equation on their boards that shows the hops.



Sam This kid tried to jump by 10s first. She jumped as many 10s as she could and then switched.

Rosa I wonder why she jumped 1 and then 6.

Amanda Lynn I think she did it to make getting to 76 easier. It's easier to figure out how far you need to jump from 70 than from 69.

Roberto The equation for this one is 10 + 10 + 1 + 6 equals 27. Hey, the answer is the same even though the picture is different!



Zane Whoa! That kid took a big leap from 50 to 75. How did they know how to do that?

Hannah I bet they were thinking of money... like quarters.

Shawn When you take a big jump like that, the work is faster. The equation is 1 plus 25 plus 1 equals 27.

9 Then ask students to compare and contrast the equations on their boards. Guide them to the observation that the order in which two numbers are added [commutative property] and how the numbers are grouped in addition [associative property] will not change the sum.

Cole They all make 27. David has to grow 27 more inches.

Yuki The one at the top and the next one have the same numbers, but they're mixed up.

Teacher Is that OK?

Tamra It still turns out the same every time. You can switch numbers, like 2 + 3 is the same as 3 + 2.

Alonso Sometimes it's easier to switch the numbers around. Like on the first one, you have to go 1 + 10 is 11. Then 11 + 10 is 21, and then plus 6 is 27. The other one is just 10 and 10 is 20, plus 7 is 27.

Teacher What about the last equation?

Thanh Well, it's weird, but it works. It's kind of like if you chop a 5 out of the 6 in the first equation. You give that 5 to the 2 tens, you have 25, and then 2 more. No matter how you add up the numbers, you still get the same answer.

- 10 Next, collect the boards, pens, and erasers and have students find the Length Problems on the Open Number Line page in their Student Books.
- 11 Display your copy of the Student Book page and read both problems with the students. When they understand what to do, let students go to work individually or in pairs.
 - As students work, circulate to observe their strategies.
 - » Check to see if they're using hops of 5, 10, and possibly other numbers, rather than hops of 1. See Support suggestions for students who are hopping only by 1s to solve the problems.
 - » Take note of students who are using interesting or efficient strategies. Ask these students to share their work when the class comes back together to review.
 - Put David's Problem back on display and encourage students to review the three different solutions to get ideas for solving these new problems.

SUPPORT If you have students counting by 1s, model their work for them on a number line, showing them every single jump in their work. Then, as they are ready, use the number line to help them group numbers by circling sets of 10.

Allow students who are struggling with the open number line model to use base ten area pieces instead. Encourage students to build the smaller number in the problem, add enough 1s to get to the nearest multiple of 10, and then add as many 10s as they can before adding any more pieces.

CHALLENGE Ask early finishers to turn the sheet over to write their own open number line problem for a partner to solve.

Work Places

12 Have students share and compare their answers when they finish the Student Book page, and then invite them to go to Work Places.

Remember to save 10 minutes at the end of the session to have students share their solutions and strategies.

- 13 When most students have completed the page, reconvene the class to share and compare answers and strategies.
 - Ask students to share their answers to the first problem. List all responses on the board.
 - Invite a few students to explain and justify their answers.
 - Repeat this with the second problem.

Don't shy away from asking a student who has given the wrong answer to share his strategy. Students often discover their own mistakes as they share with the group. Handled with respect, mistakes often turn out to be fruitful, illuminating common misconceptions, and reassuring students that it's OK to take a risk and make a mistake, especially if we can learn something from it.

While there are many unique ways to approach these problems, some strategies are worth highlighting if you observe students using them. Look for the following:

Common Strategies for Problem 1	47 + x = 82	82 - x = 47	82 - 47 = x
Description	Visual	``````````````````````````````````````	·
1. Add to get to a multiple of 10, then keep adding 10s until you can't add any more. Then count on for the rest of the 1s.	+ 3 + 10 47 50 3 + 10 + 10 + 10 + 2 =	+ 10 + 10 + 10 60 70 35, so 47 + 35 = 82	+ 2 + 10 + 2 + 2 + 2 + 2 + 2 + 80 80 82
2. Add to get to a landmark number and take a larger jump to get to the next landmark number. Then jump to the next multiple of 10 and count on for the rest of the 1s.	+3 47 50 3+25+5+2=35, so	+ 25	+2 +5 75 80 82
3. Take a large jump beyond the target using a multiple of 10. Then subtract to get to the desired number. (This is an advanced approach for most second graders.)	 47 40 - 5 = 35, so 47 + 35 	+ 40	82 87
	1		[
Common Strategies for Problem 2	84 + x = 120	120 - x = 84	120 - 84 = x
Description	Visual		
1. Add to get to a multiple of 10, then keep adding 10s until you reach a landmark number. Then add the needed 10s and 1s in one jump to finish.	+6 + +6 + 84 90 6+10+20=36, so 84	+ + + + + + + + + + + + + + + + + + +	20
2. Add 10s until you can't add any more without going past your target. Then count on for the rest of the 1s.	+ 10 + 10 84 94 10 + 10 + 6 = 36,	+ 10 + 1 + 104 so 84 + 36 = 120	0 +6 + +6 + + + + + + + + + + + + + + +

Session 4 Introducing Work Place 3C Hit the Zone

Summary

The teacher introduces Work Place 3C Hit the Zone, which features subtraction on the number line. The teacher plays several rounds with the class and asks students to track all the moves and results for their team in their Student Books. After playing the game with the class, the teacher sends students out to Work Places, including the one just introduced. Finally, the teacher introduces and assigns the Adding, Counting & Solving Problems Home Connection.

Skills & Concepts

- Fluently add and subtract with sums and minuends to 20 using mental strategies (2.OA.2)
- Represent whole-number sums as lengths on a number line (2.MD.6)
- Represent whole-number sums up to 100 on a number line (2.MD.6)
- Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)
- Reason abstractly and quantitatively (2.MP.2)
- Model with mathematics (2.MP.4)

Materials

Copies	Kit Materials	Classroom Materials			
Work Places Introducing Work Place 3C Hit the Zone					
TM T5 Work Place Guide 3C Hit the Zone TM T6 Work Place Instructions 3C Hit the Zone TM T7 3C Hit the Zone Record Sheet SB 39 3C Hit the Zone Record Sheet	 Hit the Zone Game Board Hit the Zone Spinner 1 die numbered 1–6 	 2 fine-tip erasable markers, each a different color paper towel or eraser for erasable marker 			
Work Places in Use					
 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in this session) 					
Home Connection					
HC 75–76 Adding, Counting & Solving Problems					

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

In today's session, you'll introduce Work Place 3C Hit the Zone. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 3C (which replaces 2B, The Subtraction Wheel), using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

addition subtraction sum or total*

Work Places

Introducing Work Place 3C Hit the Zone

- 1 Gather students to your discussion circle and let them know that you will introduce a new Work place game today and then they will go to Work Places for the remainder of the session.
 - Display the Hit the Zone Game Board where everyone can see it clearly.
 - Give students a minute to examine the board quietly and then share, first in pairs and then as a whole group, their mathematical observations.
 - » What do they notice about the game board? Do they have any predictions about how this game might be played?



About This Session

The Hit the Zone game provides students with practice modeling and solving subtraction problems on a number line in the range 0–30. There's also a limited opportunity for students to add numbers, depending on the spinner result. This twist adds intrigue to the game and also gives students a greater variety of starting points from which to subtract.

- Draw students' attention to the 4 lines that run the length of the game board, and explain that Hit the Zone is a game for 2, 3, or 4 players.
- To teach them how to play the game, you're going to have students play as a team against you, so you will just use the first two lines on the game board.
- 2 Then summarize the game.

Each player begins by writing his initials at the top of the game board to claim one of four lines that runs the length of the board. Next, players take turns rolling a die to determine which of six zones on the board they need to reach in order to win. Players then take turns spinning a numbered spinner that determines how far they can move along their line. After three spins each, using a different spinner each time, the player who comes closest to hitting his or her designated zone wins the round. Players total their wins, losses, and ties after four rounds to determine the overall winner.

3 Play the first round of the game with the class, using the Work Place Instructions 3C Hit the Zone Teacher Master as needed.

- Have students each find the 3C Hit the Zone Record Sheet page in their Student Books and invite them to record the game moves in their books while you do so on one of the display record sheets.
- Take the first turn to spin, mark the game board with an erasable marker, and record the move on your record sheet. Invite a volunteer to make the first spin for the class and mark the game board. Use your second copy of the record sheet to show students how to record the results of the first spin on their sheets.
- At the conclusion of the first round, demonstrate how to write a subtraction equation to show the difference between their target zone and their landing zone. The team with the lower difference wins the round.

👹 3C Hit the Zone Blank Game B	👑 3C Hit the Zone Record Sheet	👑 3C Hit the Zone Record She	et
	Zone 1 26–30 Zone 3 16–20	Zone 1 26–30 Zone 3 16–2	0 Zone 5 6–10
Mr.G class	Zone 2 21–25 Zone 4 11–15	Zone 2 21–25 Zone 4 11–15	Zone 6 0–5
$/I^{30}$ $/I^{30}$	Round 1	Round 1	Round 2
·	My Target Zone 2	My Target Zone +	My Target Zone
-10 T	Spin 1 30 - 10 = 20	Spin 1 30 - 5 = 25	Spin 1
25	Spin 2 20 + 3= 23	Spin 2 25 - 10 = 15	Spin 2
	Spin 3 23 - 10 = 13	Spin 3 15 - 7 = 8	Spin 3
=+3\(I / I	Landing Zone 4	Landing Zone 5	Landing Zone
	Zone Difference 4 - 2 = 2	Zone Difference 5 – 4 = 1	Zone Difference
_IO T ²⁰ T ²⁰	Win?	Win?	Win?
Zone 3	Tes NO	Tes No	Tes NO
	Round 3	Round 3	Round 4
1^{15} /1 ¹⁵	My Target Zone	My Target Zone	My Target Zone
⊈ \ + _7 (+	Spin 1	Spin 1	Spin 1
	Spin 2	Spin 2	Spin 2
	Spin 3	Spin 3	Spin 3
	Landing Zone	Landing Zone	Landing Zone
i I J	Zone Difference	Zone Difference	Zone Difference
× i	Win?	Win?	Win?
+5 +5	Yes No	Yes No	Yes No
	Score Wins	ScoreWins	LossesTies

4 Then play three more rounds of Hit the Zone with the class.

Pose questions like the following to promote discussion of subtraction concepts and notation while you play:

- What numbers are included in your target zone?
- How far are you from the closest number of your target zone right now?
- What number would you most like to come up on the spinner for this turn? Why?
- Every spinner has a subtract 10 as one of the numbers you can spin. Is it always good to spin a subtract 10? When is it not lucky to get a subtract 10 in this game?
- What sign do we need to use to show the difference between our target zone and our landing zone?
- Do you think it's possible for a team to land exactly in their target zone? Why or why not?

While playing the game:

• Encourage students to mark and label each move on the game board as clearly and neatly as possible.

- Be sure students understand that the game board can only be marked with a special erasable marker.
- Reinforce the importance of recording the results of each spin on the record sheet.
- Be aware that the recording process will seem complex to some students. Take time to fill in your own record sheet carefully, and ensure that students fill in their record sheets carefully and completely for each spin and each round of the game.
- 5 Then work with students to determine the winning team and show them the contents of the Work Place bin.
- 6 Give students their folders and allow them to spend the rest of the period at Work Places.
- 7 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Remind students that Hit the Zone will be available during Work Places for several weeks to come.

🕮 Home Connection

- 8 Introduce and assign the Adding, Counting & Solving Problems Home Connection, which provides more practice with the following skills:
 - Solve one-step addition and subtraction story problems with sums and minuends to 100 involving situations of putting together and comparing, with unknowns in all positions (2.OA.1)
 - Fluently add with sums to 20 using mental strategies (2.OA.2)
 - Skip-count by 5s within 1000 (2.NBT.2)
 - Solve money story problems involving quarters and dimes (2.MD.8)

Session 5 Addition & Subtraction Checkpoint

Summary

This session provides a checkpoint for much of the content covered in the first two modules of Unit 3. The ten problems in this checkpoint ask students to locate, mark, and identify numbers on a line, use the open number line to model and solve double-digit subtraction problems, use the fewest skip-jumps of 1, 5, and 10 to reach different points on the number line, and solve several double-digit addition problems using pictures of craft sticks in bundles and singles. When finished with the assessment, students turn in their work and go out to Work Places.

Skills & Concepts

- Solve one-step addition and subtraction story problems with sums and minuends to 100
 involving situations of adding to and taking from with unknowns in all positions (2.OA.1)
- Skip-count by 5s and 10s within 1000 (2.NBT.2)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Represent whole numbers as lengths on a number line (2.MD.6)
- Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)

Materials

Copies	Kit Materials	Classroom Materials			
Assessment Addition & Subtraction Checkpoint					
TM T10–T12 Addition & Subtraction Checkpoint	craft sticks (see Preparation)				
Work Places in Use					
 2C Number Line Race (introduced in Unit 2, Module 2, Session 1) 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 					

HC – Home Connection, SB – Student Book, TM – Teacher Master

Copy instructions are located at the top of each teacher master.

Preparation

Prepare several baskets of craft sticks bundled into sets of 10, as well as individual sticks for students who want to use these tools during the assessment.



Assessment 🖉

Addition & Subtraction Checkpoint

- 1 Introduce the Addition & Subtraction Checkpoint.
 - Give each student a copy of the checkpoint.
 - Display 1 copy and use it to review and clarify the tasks.
 - When you review problem 2, be sure students understand that they will need to make and label new marks for some of the numbers, while for others, they'll simply need to label marks that have already been made on the line.
 - When you are review problems 5–8 with the class, let students know that they can use actual bundles and sticks to help model and solve the problems if they need them. Explain how, where and when students can access these materials.
 - When you review problems 9 and 10, be sure students understand the task in both cases is to move from 0 to the destination point using the fewest jumps, but that they can only use jumps of 1, 5, and 10. Remind them that it's fair to jump backward as well as forward along the line if that will result in fewer jumps. Remind them, too, that they cannot simply jump by 1s along the line.
 - Let students know that they can turn in their papers when they finish and go to Work Places.
- 2 Give students time to work on the checkpoint.

觉 Work Places

- 3 As students finish their assessments, have them turn in their papers, get their Work Place folders and find one of the Work Place games or activities to do quietly until everyone has finished.
- 4 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Ask students to pair-share how they felt about the assessment, and have a couple of volunteers share their thoughts and feelings with the class.

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See the Unit 3 Assessment Guide at the end of the unit for scoring guides, answer keys, and intervention suggestions.


Teacher Masters

GRADE 2 – UNIT 3 – MODULE 2



The Jimenez Family

Here is a list of the people in the Jimenez family. The list shows how old each person is. Make and label a mark along the number line for each person in the family.

- Carlos (6)
- Ana (9)
- Nicholas (15)
- Maria (20) Uncle Leo (28)
 - Aunt Elsa (40)
 - Mom (49)
- Dad (55)
- Grandpa (75)
- Grandma (80)





Open Number Line Problems

1 Josh and his dad are driving to the city. It is 75 miles away. They have already gone 38 miles. How many more miles do they have to drive?



2 Maria Jose wants to buy a bike that costs 72 dollars. So far, she has saved 26 dollars. How much more money does she need to save?

3 Pablo had 39 baseball cards. He got some more baseball cards for his birthday. Now Pablo has 63 baseball cards. How many baseball cards did Pablo get for his birthday?





David's Problem

David is 49 inches tall. His big brother, Matt, is 76 inches tall. How many inches will David have to grow to be as tall as his big brother?

Equations:

Solution 1



Solution 2



Solution 3





Summary

Hit the Zone is a game for 2–4 players. Each player begins by writing his initials at the top of the game board to claim one of four lines that runs the length of the board. Next, players take turns rolling a die to determine which of six zones on the board they need to reach in order to win. Players then take turns spinning a numbered spinner that determines how far they can move along their line. After three spins each, using a different spinner each time, the player who comes closest to hitting his designated zone wins the round. Players total their wins, losses, and ties after four rounds to determine the overall winner.

Skills & Concepts

- Fluently add and subtract with sums and minuends to 20 using mental strategies (2.OA.2)
- Represent whole-numbers as lengths on a number line (2.MD.6)
- Represent whole-number sums up to 100 on a number line (2.MD.6)
- Represent whole-number differences from minuends up to 100 on a number line (2.MD.6)

Materials

Copies	Kit Materials	Classroom Materials
TM T5 Work Place Guide 3C Hit the Zone TM T6 Work Place Instructions 3C Hit the Zone TM T7 3C Hit the Zone Record Sheet TM T8 Hit the Zone Blank Game Board (optional, as needed) TM T9 Hit the Zone Blank Triple Spinners	 2 Hit the Zone Spinners 2 Hit the Zone Game Boards 2 dice numbered 1–6 clear spinner overlay (optional, needed for Challenge suggestion) 	 6 erasable markers 6 erasers or pieces of paper towel

Assessment & Differentiation

If you see that	Differentiate	Example
Students are having difficulty remembering the steps.	SUPPORT Have students who are struggling play the game with students who are playing confidently. You might pair high and low here, or place a struggling student with a group of three others who are more confident with the steps and the recording process.	
A few students are struggling to fill in the record sheet.	SUPPORT While Hit the Zone is a fairly simple game, the record sheet may be difficult for some students. You might consider letting these students play multiple rounds of the game without the record sheet, just to get the benefit of modeling addition and subtraction on a number line.	
Many, if not most of the students are struggling to fill in the record sheet.	SUPPORT If problems with the record sheet are wide-spread, demonstrate how to play the game and track the action on the record sheet by playing again, or perhaps several times, with the whole class. Have all the students fill in a record sheet for the class, while you fill in record sheets for yourself and the class.	
Students are playing the game with confidence and ease, and might benefit from a challenge.	CHALLENGE Since there are four lines of play on the game board, some students might enjoy playing two lines at once, and keeping two record sheets as they go. This definitely takes the game to new levels of complexity.	
A few students seem to take particular interest in the game.	CHALLENGE You might encourage such students to make their own versions of the game board and spinners. Use the Hit the Zone Blank Game Board and Blank Spinners Teacher Masters for this purpose.	Students might number the four lines in multiples of 10 or 20 instead of 5. In either case, the value of each of the small hash marks increases as well, to 2 and 4 respectively, instead of 1. These students might change the numbers and even the operations on the spinners, increasing the magnitude of the numbers, and including fewer that are multiples of 5 and 10.

Work Place Instructions 3C Hit the Zone

- 1 Two, three, or four players can play this game. Each player needs a record sheet, wipe-off pen, and eraser. Players will share a spinner, a game board, and a die.
- 2 Players start by writing their initials at the top of the game board to claim one of the four lines that runs the length of the board.
- 3 Each player rolls the die to determine which zone she needs to land in or get closest to, in order to win Round 1. That is her target zone, and she records it at the top of the Round 1 box on her record sheet.
- 4 Players each begin at 30, and work their way toward their designated zone by spinning the spinner three times. Each player takes a turn to spin the first spinner on the Hit the Zone Triple Spinner and mark the game board with a wipe-off pen to show the result. Then she records the move on her record sheet.
- 5 Players take turns spinning twice more, using the second and then the third spinner. If a player makes a spin that will force her to move off the game board, she takes another spin using the designated spinner until she is able to move.
- 6 After the third spin, players record their landing zone, along with a subtraction equation to show how close they got to their target zone. The player who got closest to her target zone wins the first round, and each player circles yes or no at the bottom of the Round 1 box to show whether or not she won. Players erase the game board and get ready to play the next round.

Unit 3 Module 2 Session 4 opt onal copies as needed	Unit 3 Module 2 Session 4 2 copies for displa NAME Alana	Unit 3 Module 2 Session 4 2 copies for display and a class s	et plus more as needed stored n the Work Place bin DATE
👹 3C Hit the Zone Blank Game	👹 3C Hit the Zone Reco	👹 3C Hit the Zone Record She	et
SR AF	Zone 1 26–30 Zor Zone 2 21–25 Zor	Zone 1 26-30 Zone 3 16-2 Zone 2 21-25 Zone 4 11-1	20 Zone 5 6–10 5 Zone 6 0–5
5/ + -5/ +	Round 1	Round 1	Round 2
	My Target Zone 6	My Target Zone 4	My Target Zone
× I I I	Spin 1 30-5=25	Spin 1 30-5=25	Spin 1
25 25	Spin 2 25 - 0 = 5	Spin 2 25-5=20	Spin 2
$\frac{1}{2}$ / $\frac{1}{2}$ -5/ $\frac{1}{2}$	Spin 3 5 – 7 = 8	Spin 3 20+2=22	Spin 3
	Landing Zone 5	Landing Zone 2	Landing Zone
	Zone Difference 6 - 5 =	Zone Difference 4-2=2	Zone Difference
	Win?	Win?	Win?
	Yes No	Yes No	Yes No
	Round 3	Round 3	Round 4
	My Target Zone	My Target Zone	My Target Zone
4 + +	Spin 1	Spin 1	Spin 1
Ř t	Spin 2	Spin 2	Spin 2
-7	Spin 3	Spin 3	Spin 3
	Landing Zone	Landing Zone	Landing Zone

7 Players complete three more rounds and record their win, loss, and tie totals at the bottom of the record sheet to determine the overall winner.

🕮 3C Hit the Zone Record Sheet

Zone 1	26–30
Zone 2	21–25

Zone 3 16–20 **Zone 4** 11–15

Zone 5 6–10 **Zone 6** 0–5

Round 1			Rou	nd 2
My Target Zone		My Target Zone		
Spin 1		Spin 1		
Spin 2		Spin 2		
Spin 3		Spin 3		
Landing Zone		Landing Zone		
Zone Difference		Zone Difference		
Win?			Wi	n?
Yes	No	Yes		No

Round 3				
My Targ	et Zone			
Spin 1				
Spin 2				
Spin 3				
Landiı	Landing Zone			
Zone Difference				
Win?				
Yes No				

Round 4				
My Targ	et Zone			
Spin 1				
Spin 2				
Spin 3				
Landir	ng Zone			
Zone Difference				
Win?				
Yes No				

Score

Wins

Losses

Ties







1 Fill in the missing numbers on the number line.



| DATE

2 Write each number where it belongs on the number line. You will need to make new marks for some of the numbers.





3 Use the number line to solve the problem. Show all your work. Then write your answer in the box.



4 Use the number line to solve the problem. Show all your work. Then write your answer in the box.

Γ

Addition & Subtraction Checkpoint page 2 of 3

5 How many sticks in all? ____



- **6** Look at the two collections of sticks.
 - **a** How many sticks are in each collection? Write your answers on the lines.

| DATE



- **b** If you put the collections together, how many sticks are there in all?
- 7 Julia has 4 bundles and 3 sticks. If her friend gave her 2 more bundles and 9 more sticks, how many sticks would she have in all? Show your work.



8 Richard has 5 bundles and 8 sticks. If he gave his friend 3 bundles and 2 sticks, how many sticks would Richard have left? Show your work.



(continued on next page)



| DATE

Addition & Subtraction Checkpoint page 3 of 3

9 Use jumps of 10, 5, or 1 to go from 0 to 36. Take as few jumps as you can. Label your jumps. You can try again on the second number line if you see a way to do it in fewer jumps.



10 Use jumps of 10, 5, or 1 to go from 0 to 44. Take as few jumps as you can. Label your jumps. You can try again on the second number line if you see a way to do it in fewer jumps.



Student Book

GRADE 2 – UNIT 3 – MODULE 2



Show how you solve the story problems below.

Problem 1



| DATE

Problem 2



Problem 3



Length Problems on the Open Number Line

Use the open number line to solve each of these problems. Be sure to label your work and show the answer.

1 Little Inch Worm is going to visit her grandma. Her grandma lives 82 inches away. Little Inch Worm has already crawled 47 inches. How many more inches does she have to crawl?

47 Little Inchworm has to crawl _____ more inches.

2 We have 2 jump ropes. The red one is 120 inches long. The blue one is only 84 inches long. How many inches longer is the red rope than the blue rope?



🖄 3C Hit the Zone Record Sheet

Zone 1 26–30	Zone 3 16–20	Zone 5 6–10
Zone 2 21–25	Zone 4 11–15	Zone 6 0–5

Rou	nd 1	Round 2		nd 2
My Target Zone		My Target Zone		
Spin 1		Spin 1		
Spin 2		Spin 2		
Spin 3		Spin 3		
Landing Zone		Landing Zone		
Zone Difference		Zone Difference		
Win?			Wi	in?
Yes	No	Yes		No

Round 3					
My Targ	My Target Zone				
Spin 1					
Spin 2					
Spin 3					
Landiı	Landing Zone				
Zone Difference					
Win?					
Yes No					

Round 4				
My Targ	et Zone			
Spin 1				
Spin 2				
Spin 3				
Landir	ng Zone			
Zone Difference				
Win?				
Yes No				

Score

____ Wins

_____ Losses

___ Ties



Home Connections

GRADE 2 – UNIT 3 – MODULE 2



Family Age Number Line page 1 of 2

Note to Families

Students have been learning how to use the number line to solve subtraction problems. In this assignment, your child will use a length of adding machine tape to make a number line that shows the ages of some of the people in your family, and then use the number line to solve some problems.

Materials

- Family Age Number Line, pages 1–2
- · length of adding machine tape (brought home from school)
- pencil and crayons or colored markers

Making the Number Line

1 In the table below, write the names and ages of 5 to 7 family members. This can include children, adults, grandparents, cousins, aunts, uncles, or even pets.

Name	Age

2 Now write the ages you listed above in order, from youngest to oldest, on the lines below. (There are 7 lines, but you only have to use as many as you need.)

	,	,	,	,	,
least					greatest

- **3** Get the length of adding machine tape you brought home. Write a 0 at the far left side and the age of the oldest person you listed on the right side. Here is an example.

4 Now write the rest of the ages you listed where they belong on the adding machine tape.

(continued on next page)

67

0

Family Age Number Line page 2 of 2

Solving Problems on the Number Line

5 Use your adding machine tape number line to help figure out the difference between the oldest and youngest person on your list. Show the strategy you used on the open number line below. Then write your answer.

The oldest person on my family list is _____ years older than the youngest person on my family list.

6 Choose an adult in your family and use the adding machine tape number line to help figure out the difference between your age and the adult family member's age. Show the strategy you used on the open number line below. Then write your answer.

My family member is _____ years older than I am.

7 Timmy is 8. His dad is 32. Use hops on the open number line below to find out how much older Timmy's dad is than Timmy. Then fill in the missing numbers in the equations below.



8 CHALLENGE Why does the same number work in both of the equations above?

Adding, Counting & Solving Problems page 1 of 2

1 Fill in the missing numbers to complete the addition facts.

5 + 5 =	4 + 4 =	2 + 2 =
8 + = 16	9 + = 18	+ 6 = 12
+ 3 = 6	10 + 2 =	6 + 10 =
3 + = 13	10 + = 18	8 + = 16

2 Fill in the missing numbers to complete the pattern.



3 CHALLENGE Skip-count by 5s. Circle the word to show whether you went forward or backward each time.

а	143, 138, 133,, 123,, 113,, 98	forward	backward
b	332, 337, 342,, 352, 357,, 372,	forward	backward
C	488, 493, 498,, 513,,, 533	forward	backward
d	267, 262, 257,,, 237,, 227,	forward	backward

(continued on next page)

Adding, Counting & Solving Problems page 2 of 2

- **4** Mrs. Brown is the gym teacher. She has 15 soccer balls and 8 footballs.
 - **a** How many more soccer balls than footballs does Mrs. Brown have? Show your work.

Mrs. Brown has _____ more soccer balls than footballs.

b How many soccer balls and footballs does Mrs. Brown have in all? Show your work.

Mrs. Brown has ______ soccer balls and footballs in all.



5 CHALLENGE Jason had 2 quarters and 1 dime. He went to the school store to spend all his money. What 3 things could he buy? Find at least 2 different answers. Show your work.

School Store Price List			
Markers	\$0.25 each		
Tablets	\$0.30 each		
Erasers	\$0.10 each		
Pencils	\$0.20 each		
Folders	\$0.15 each		





Digital Resources

GRADE 2 – UNIT 3 – MODULE 2



Unit 3 Module 2 Digital Resources

These resources, selected from the curated collection at the Bridges Educator site, can be used to extend instruction and support students during this module.

Apps by The Math Learning Center

Number Line

Number Line helps students visualize number sequences and model strategies for addition, subtraction, multiplication, and division. It can be used to represent sequences of numbers, including whole numbers and multiples of a variety of numbers. Students can use what they know about number relationships and computation to identify missing elements of sequences shown on the number line.



catalog.mathlearningcenter.org/apps/number-line

Number Pieces

This app allows students to manipulate base ten pieces and write on the screen. One advantage to these virtual base ten pieces is that students can group units to make strips, and strips to make mats—something not possible with physical base ten pieces. You might make the Number Pieces Basic app available to students to use in modeling and solving the story problems posed throughout the unit, especially in activities that involve physical sticks and bundles or base ten pieces.

catalog.mathlearningcenter.org/apps/number-pieces

Additional Resources

Number Line Jump Maker

Number Line Jump Maker allows you to make labeled jumps of any size that will be more uniform and more easily read than when drawing them on the board. You can show jumps of different sizes simultaneously by clicking on the start point a second time and making a jump of a different size. You might use this tool to model computation in Module 2, Sessions 1 and 2.

ictgames.com/numberlineJumpMaker/index.html

Catapult Count On

Students play this game individually by adding a single digit to a double digit to jump to the next multiple of 10 on a number line so they can destroy a castle. Players can pull down on the catapult to adjust the number added on the number line. The "hide jumps" option encourages players to use mental math.

www.ictgames.com/catapultCountOn/index.html

ICT Number Line Games & Tools

A variety of number line games and tools support students in developing number sense, addition and subtraction skills. Many of these tools can be used for demonstration purposes as well.

ictgames.com/addition.htm



Virtual Manipulatives

Additional apps, including the Number Rack and Geoboards, are available free from the Math Learning Center for web, iOS and other platforms.

Math Vocabulary Cards

The Math Vocabulary Cards app (available for web and iOS) helps students deepen their conceptual understanding of key terms in mathematics. Each card features a math term, a representative example or model, and a concise definition.

Bridges Educator Site Resources

The following resources are available to Bridges classrooms at the Bridges Educator site.

Interactive Whiteboard Files

Interactive whiteboard files in SMART Notebook and IWB formats for the teacher masters in each module.

Family Overviews

Brief overviews of each Bridges unit, designed to be sent home to families. Available in English and Spanish.

Support & Intervention

Targeted instruction and support, addressing Tier 2 within the Response to Intervention framework. Each volume contains activities, games, and practice pages that can be used for reteaching, practice, and progress monitoring.



Teachers Guide

GRADE 2 – UNIT 3 – MODULE 3



Module 3 Present & Parcel Story Problems with Two-Digit Numbers

Session 1	Introducing Presents & Parcels	.3
Session 2	Solving Picture Problems	.9
Session 3	Creating Picture Problems, Part 1	15
Session 4	Creating Picture Problems, Part 2	21
Session 5	Solving Student-Posed Story Problems	27
Session 6	Shopping for Story Problems	33
Session 7	Unit 3 Post-Assessment	39

Teacher Masters

Pages renumber with each module.
Introducing Presents & ParcelsT1
Work Place Guide 3D Base Ten Triple SpinT3
Work Place Instructions 3D Base Ten Triple Spin
3D Base Ten Triple Spin Record Sheet
Presents & Parcels Talk BubblesT7
Presents & ParcelsT9
Presents & Parcels Picture Problem Background 1T10
Presents & Parcels Picture Problem Background 2 T11
Work Place Guide 3E Target TwentyT12
Work Place Instructions 3E Target TwentyT13
3E Target Twenty Record SheetT15
Unit 3 Post-AssessmentT16

Home Connections Pages

Page numbers correspond to those in the consumable books.

Tens & Ones, Nuts & Carrots	.77
Shopping & Adding	.79
Solving Presents & Parcels Story Problems	81
Shopping & Subtracting	.83

Module 3 **Present & Parcel Story Problems** with Two-Digit Numbers

Overview

Over the next seven sessions, students work with 2-digit numbers and problem solving by exploring scenarios that involve single presents (representing 1s) and parcels of presents (representing 10s). Students learn to identify the key information in a story problem, work as a group and individually to solve story problems, create their own story problems, and then solve the problems created by their classmates. Students quickly learn that while counting by 1s can be used to solve these problems, working in 10s and 1s is far more efficient. Two new Work Places are introduced to provide students practice with modeling, reading, and comparing 3-digit numbers, as well as solving addition facts to 20.

Planner

Session & Work Places	P&I	WP	A	нс
Session 1 Introducing Presents & Parcels This session introduces the Presents & Parcels scenario and sets the stage for the story problems students will pose and solve over the next seven sessions. In the second half of the session, students learn to play Work Place 3D Base Ten Triple Spin, a deceptively simple strategy game that may puzzle some students at first but provides good opportunities for building triple-digit number sense.	•	•		•
Introducing Work Place 3C Base Ten Triple Spin Players spin for a digit 2–7 and decide if they want that spin to represent 1s, 10s, or 100s. As they decide, they take the appropriate base ten area pieces and continue spinning until each player has built a 3-digit number. The players then sketch their base ten area pieces on a shared record sheet, write their numbers in expanded form, and compare the numbers to determine the winner.				
Session 2 Solving Picture Problems In this session, students independently solve a collection of six story problems, using the written and visual information to solve the problems. As they solve each problem, they come back together as a group to discuss solutions and strategies.	•	•		
Session 3 Creating Picture Problems, Part 1 This session is the first of two that will challenge students to create their own Presents & Parcels picture problems. In this session, students each create the scene for the story problem they will write next session.	•	•		•
Session 4 Creating Picture Problems, Part 2 Students continue the work they began in Session 3. They finish their picture prob- lems, write their stories, and add talk bubbles, question marks, and other needed clues. After the session, the teacher types each student's story and prepares them for problem-solving activities during the remaining sessions of the module.	•	•		
Session 5 Solving Student-Posed Story Problems Before this session, the teacher selects two or three students' picture problems for the class to work on together. As each of these problems is presented, students show their strategies and solutions on paper. Then they share their thinking with others in the group. Finally, the teacher introduces a new Work Place, Target Twenty, an addition facts game.	•	•		•
Introducing Work Place 3E Target Twenty Players draw five cards from a deck and then choose three of the cards to add together to get as close as possible to 20. Then they find the difference between their score and 20. The winner is the player with the lowest score after five rounds.				
Session 6 Shopping for Story Problems Today the teacher models the procedure for choosing and solving story problems from the collection the class has generated. The students then select and work one problem at a time, completing as many as they can during this session. The work from this session and the next can be scored and saved as a Work Sample.			•	
Session 7 Unit 3 Post-Assessment Students complete the Unit 3 Post-Assessment today. As they finish and turn in their assessments, they return to shopping for story problems as they did in Session 6.			٠	•

P&I - Problems & Investigations, WP - Work Place, A - Assessment, HC - Home Connection

Materials Preparation

Each session includes a complete list of the materials you'll need to conduct the session, as well as notes about any preparation you'll need to do in advance. If you would like to prepare materials ahead of time for the entire module, you can use this to-do list.

Task		Done
Copies	Run copies of Teacher Masters T1–T19 according to the instructions at the top of each master.	
	If students do not have their own Home Connections books, run a class set of Home Connections pages 77–84.	
Work Places	Prepare the materials for Work Places 3D & 3E using the lists of materials on the Work Place Guides (Teacher Masters T3 and T12).	
Paper Cutting	Consider cutting some presents and parcels from Teacher Master T9 before Session 3.	
	Create a class set of blank talk bubbles by cutting rounded rectangles (approximately $2'' \times 3''$) from white construction paper.	
Special Items	Prepare several baskets of craft sticks bundled into sets of 10, as well as individual sticks.	
	Prepare several baskets of large base ten area pieces.	
	Have a plan in place for preparing student story problems for Sessions 5 through 7. See the Preparation section of Session 4 for more information.	

Additional Resources

Please see the Resources section at the end of this module for a collection of resources you can use with students to supplement your instruction.
Session 1 Introducing Presents & Parcels

Summary

This session is an introduction to the Presents & Parcels scenario and sets the stage for the story problems students will pose and solve over the next seven sessions. Students are introduced to the idea that presents will come packaged in sets of 10 as well as individually, which provides a convenient way to model two-digit numbers. In the second half of today's session, the teacher introduces Work Place 3D Base Ten Triple Spin, which builds triple-digit number sense. Finally, the teacher introduces and assigns the Tens & Ones, Nuts & Carrots Home Connection.

Skills & Concepts

- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones (2.NBT.1)
- Skip-count by 10s and 100s within 1000 (2.NBT.2)
- Read and write numbers to 1000 represented with numerals and in expanded form (2.NBT.3)
- Compare pairs of 3-digit numbers, based on an understanding of what the digits in their hundreds, tens, and ones places represent (2.NBT.4)
- Use >, =, and < symbols to record comparisons of two 3-digit numbers (2.NBT.4)
- Reason abstractly and quantitatively (2.MP.2)

Materials

Copies	Kit Materials	Classroom Materials
Problems & Investigations Introducing Pres	sents & Parcels	
TM T1–T2 Introducing Presents & Parcels		 student whiteboards, markers, and erasers (class set)
Work Places Introducing Work Place 3D Ba	se Ten Triple Spin	
TM T3• 1 set of large base ten areaWork Place Guide 3D Base Ten Triple SpinpiecesTM T4-T5• 10 additional red hundredsWork Place Instructions 3D Base Ten Triple Spinpieces from the sets of largeTM T6base Ten Triple Spin Record Sheet3D Base Ten Triple Spin Record Sheet• 1 Base Ten Triple Spin Spinner		
2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 3D Base Ten Triple Spin (introduced in this session)		
Home Connection		
HC 77-78 Tens & Ones, Nuts & Carrots		

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

In today's session, you'll introduce Work Place 3D Base Ten Triple Spin. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 3D (which replaces Work Place 2C Number Line Race), using the materials listed on this guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* greater than* less than* expanded notation

Problems & Investigations

Introducing Presents & Parcels

- 1 Open today's session by explaining to the students that they will spend the next few sessions creating and solving story problems about presents and parcels.
 - Ask them if they know what a *parcel* is.
 - Invite students to talk briefly about occasions where they have received presents and what they received.
- 2 Display the Introducing Presents & Parcels Sheet 1 Teacher Master for all students to see.



- Ask students to study the picture quietly for about half a minute.
- What do they notice? What do they see?
- Then have students each turn to a partner to share observations.
- 3 Next, invite students to share their observations with the group. Encourage participation and varied ideas while leading the conversation in the direction of mathematical observations.

About This Session

As students make observations about different scenes involving people, presents and parcels, don't be surprised if they focus on the pictorial rather than mathematical elements-who and what are in scenes, what the occasion is, even how the scenes are drawn. Ideally, your students will be brimming over with quantitative as well as narrative remarks. But if that's not the case, you might lead them with such questions as "How many presents are there in the closet if you total them up?"

Monica 3 girls all look alike; are they triplets?
Bo There are balloons on the table and the presents in the closet.
Devon I wonder if it is a holiday or a birthday.
Teacher Do you see anything you can count?
Pedro There are 4 presents on each closet shelf. Looks like there are 12 in all.
Latisha I see 4 balloons and 3 girls.
Teacher What about the presents? Can the girls share the presents?
Latisha If they share the presents, they each get four.
Asa I think they can each have one balloon, too.

CHALLENGE Press students to consider how they would handle sharing four balloons with three girls. Students should see that you cannot split up the remaining balloon into three pieces for the girls to share. Ask students to consider how their solution to dealing with the remainder would change if the girls were sharing four apples or four pitchers of water.

- 4 Display the Introducing Presents & Parcels Sheet 2 Teacher Master and repeat the think-pair-share process described in steps 2 and 3.
- 5 Then have helpers pass out whiteboards, pens, and erasers, and work with the students to draw various quantities of presents using simple diagrams to represent parcels (tens) and presents (ones).

While the discussion in your classroom may take a very different path than what is described here, keep in mind these goals:

- Students see parcels as groups of ten and presents as ones.
- The numbers of parcels and presents can be put together to make a two digit number that represents the total number of presents.
- You can count by tens to get the total number of presents in a group of parcels.
- You can represent a number of presents in expanded form by showing it as the sum of the number of parcels and presents.
- Having a shorthand way to represent the parcels and presents will make it easier solve problems and communicate thinking in later sessions.

Teacher As you might have guessed, we are going to be posing and solving story problems about presents in the next few days. Just to practice a little today, let's draw some presents right now. Let's make our drawings simpler than the ones in the display, though, so they don't take so long. Let's make big rectangles to represent the parcels of 10 and small squares to represent the individual presents, like this (sketches on the board or at the overhead while students work on their whiteboards):



Ryan These pictures are kind of like the base ten area pieces. **Teacher** Good observation! What if I asked you to use the small squares and rectangles to represent 13 presents?

Hannah That's easy. It's just 13 of those little guys—those little squares, like this:



You are helping students transition from quantitative to abstract reasoning when you label the sketches in this way. Students are not able to count the 10 presents in each parcel, but the labels remind them of the quantities and help them make connections to their place value understandings as well.

Teacher That's one way to do it. Does anyone have a different idea? **Ayisha** I just made 1 long rectangle—that parcel thing that holds 10 presents—and 3 more little squares, like this:

I 0	
-----	--

Teacher That is a good way to represent 13 because 10 plus 3 equals 13. (Writes 10 + 3 = 13 near the student sketch.)

Teacher Hmm—what if I asked you to represent 46 presents? Now, before you get started, I'm going to tell you that you could draw 46 little squares, but it might take a very long time. So I'm going to challenge you to use some parcels of 10 instead of drawing all those presents by one-by-one. I'd like you to write an addition equation for 46 beside your drawing too.

Thanh Here's my work.

10	10	
10	10	+6

Teacher Great! What does the 4 in 46 mean?

Thanh It's the 4 big packages—the parcels.

Teacher Can you tell me a fast way to count the presents in the parcels?

Thanh Count by 10s-10, 20, 30, 40.

Teacher So the 4 in 46 doesn't the 4 just mean 4? It looks like a 4 to me!

Students It's 4 tens!

SUPPORT While you may have a few students who would be more comfortable drawing out the presents by 1s, no matter how many, it's necessary at this point to push the issue just a bit. If some of your students are not sure how to draw the quantities using rectangles to represent parcels of 10 as well as squares to represent individual presents, have them sit with students who are and copy for a bit.

6 Give students a few more 2-digit numbers to model by sketching presents and parcels.

Be sure to include at least one teen number, one number that ends in 0, and one that ends in 1. **SUPPORT** If some of your students get confused at all, it's likely to be over a teen number, especially 11, 12, 13, and 15, where the language being used for the quantities is less clear than 16 or 18, and considerably less clear than 27 or 65. Watch carefully as students form these numbers and give them similar numbers to practice if you see a problem.

7 Wrap up this part of the session by telling students they will have a chance to use drawings like the ones they created today to solve problems with presents and parcels over the next few sessions.

Work Places

Introducing Work Place 3D Base Ten Triple Spin

- 8 Have students join you in the discussion circle and explain that you are going to introduce a new Work Place game.
 - Display a copy of the 3D Base Ten Triple Spin Record Sheet.
 - Explain that this game will help them build, name, record, and understand 3-digit numbers.
 - Then let students know that they will play the game as a class today, but they won't have time to go to Work Places until next session.
- 9 Briefly summarize the game before playing the game.

Players begin by spinning to determine if they will win with a large or small number. Players then take turns spinning for a digit 2–7 and deciding if they want that spin to represent 1s, 10s, or 100s. As they decide, they take the appropriate base ten area pieces and continue spinning until each player has built a 3-digit number. The players then sketch their base ten area pieces on a shared record sheet, write their numbers in expanded form, and compare the numbers to determine the winner.

- 10 Then divide the class into two teams (Red Team and Blue Team), and have them begin playing against each other with your guidance. Use the Work Place Instructions 3D Base Ten Triple Spin Teacher Master as needed.
 - Ask students to move to two separate locations in the discussion area.
 - Then have a volunteer spin the Greater than/Less than spinner to determine if the teams will play for more or less this round, and circle the word *more* or *less* on the record sheet.
 - Explain that the teams will takes turns spinning the number spinner. Each of the three times they spin, the students on that team will decide whether to take the spin in hundreds, tens, or ones, and they will collect the appropriate base ten area pieces.

It will take several times through for some students to understand that they only get three spins and that each spin must be taken in a different denomination. That is, they can't take two of the spins in 100s. They must spin once for 100s, once for 10s, and once for 1s. But, they can choose which of the three denominations they want to use their spin for on their first turn and which of the remaining denominations they wish to use their spin for on the second turn. (The denomination of the third spin is determined, of course, by their first two choices.)

Teacher Let's have the Red Team take the first spin. Remember, the team with the higher number at the end will win this round.

Red Team We spun a 5!That's a good one!Let's take it in 100s.No, I think we should take it in 10s!No, Is!Teacher If you're on the Red Team and you want to offer your
opinion and try to convince your teammates it's a good choice, raise
your hand!Sue Lynn I think we should take it in 1s because 5 isn't the highest
number on the spinner.Ricky But we might not get a 6 or a 7. Five might be the highest
number we get.Callie Let's take it in 10s just in case we get a higher number on one

Callie Let's take it in 10s just in case we get a higher number on on of our other spins.

Red Team Yeah! That's a good idea!

Asa I still think we should take it in 1s. We might get higher numbers on both of our other spins.

Teacher Raise your hand if you want to take the 5 in 1s. In 10s. In 100s. It looks like most of you agree that you should take it in 10s. Let's get the Red Team 5 tens from our base ten area pieces.

11 Once teams have each spun three times and collected their base ten area pieces, show teams how to record their results on the 3D Base Ten Triple Spin Record Sheet using shorthand notation.

The following method of shorthand notation will make the process of recording easier. Use square boxes for 100s, lines for 10s, and dots for 1s.



- 12 Ask students to help write a comparison statement for the two team scores, and then determine a winner. Circle the winner on the record sheet.
- Have teams play a second round on the same record sheet.CHALLENGE Have students figure the difference between the two scores on the second round.
- 14 Close the session.
 - Explain to students that if they have time to visit Work Places during the next few sessions, Base Ten Triple Spin will be available to them to play with a partner.
 - Ask students to imagine that someone has left 5 parcels and 6 presents outside the classroom door. How many presents would that be in all? Would there be enough presents for every student in the class to have 1? Would there be enough presents for every student in class to have 2? How do they know?

Home Connection

- 15 Introduce and assign the Tens & Ones, Nuts & Carrots Home Connection, which provides more practice with:
 - Demonstrate an understanding that the digits in a 2-digit number represent amounts of tens and ones (1.NBT.2)
 - Solve two-step addition and subtraction story problems with sums and minuends to 100 involving situations of adding to, putting together, and taking from with unknowns in all positions (2.OA.1)
 - Solve money story problems involving dimes and pennies (2.MD.8)

Extension & Support

If some of your students need practice using base ten pieces to build different 2- and 3-digit numbers, consider having them use the online Base Ten activity instead of or in addition to Base Ten Triple Spin during Work Places over the next couple of weeks.

This web-based activity shows different 2- or 3-digit numbers out of sequence, and invites students to build each using units, strips, and mats. As they add pieces to their collection, a number line at the bottom of the screen shows the total, supporting students learning to read and understand numbers to 100 or 1,000.

The activity also encourages students to move from one quantity to the next, adding to or subtracting from their collection of pieces, rather than clearing the screen each time.

This and other resources are listed in the Resources section at the end of the module.

Session 2 Solving Picture Problems

Summary

In this session, the teacher presents a collection of six story problems in picture form. Although there's a written story to go with each, the focus is on identifying the shorthand "talk bubbles" that go with each problem. The students then work independently to use the written and visual information to solve the problems, but come back together as a group after each problem to discuss strategies.

Skills & Concepts

- Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
- Model and describe division situations in which sets are separated into equal parts (supports 2.OA)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Add three 2-digit numbers (2.NBT.6)
- Explain why strategies for adding and subtracting 2- digit numbers work, using place value and the properties of operations (2.NBT.9)
- Make sense of problems and persevere in solving them (2.MP.1)
- Attend to precision (2.MP.6)

Materials

Copies	Kit Materials	Classroom Materials
Problems & Investigat	ions Solving Picture Problems	
TM T7-T8 Presents & Parcels Talk Bubbles	 Presents & Parcels Picture Problems large base ten area pieces (see Preparation) craft sticks (see Preparation) 	 8.5" × 11" white copy paper (1 sheet per student) hard surface for writing (such as a clipboard or a whiteboard)
Work Places in Use		
 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 3D Base Ten Triple Spin (introduced Unit 3, Module 3, Session 1) 		

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

Presents & Parcels Talk Bubbles

- Run a single copy of each sheet and cut the bubbles apart.
- Attach the bubbles lightly to a wall or a board near your discussion area with loops of masking tape. Students will be matching them to the correct picture problems, so it is important that the bubbles are easy to remove and reattach.

Sticks & Pieces

Some students will need access to craft sticks bundled into sets of 10 and individual sticks to help solve today's problems. Others may prefer to use the tens and ones pieces from the sets of large base ten area pieces. Consider making several baskets of each type of material (bundles & sticks and base ten area pieces) to make available to students while they're working.

9

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

Unit 3 Module 3

Session 2

compare* difference* greater than* left over less than* share sum or total*

Problems & Investigations

Solving Picture Problems

- 1 Gather students in the discussion circle and tell them that today they will talk about presents and parcels again, but this time they will solve math problems using the pictures they see.
- 2 Then show students the first picture problem, with the story folded under so all they can see is the illustration. Ask students to make observations about the picture itself and if they can figure out the problem being posed just by looking at the picture.



Trent It's another party, with lots of presents!

Callie I wish I could get that many presents. There's even a box with 10—one of those parcel things.

Sue Lynn There are 4 presents on top of the table and 12 sitting on the floor.

Raul Are there any presents in the closet? It's closed so I can't tell!

Teacher Can you tell what to do just by looking at the picture?

Robbie Not really. Maybe add up all the presents?

Devon Or maybe more people are coming, and you have to figure out how many presents for each person.

Teacher Good predictions. Lucky for us, there is a story flap at the bottom. We can fold it down and read the story to see if it tells us what we need to figure out here.

3 Now fold down the story flap and read the problem to the class.

It was the day of the big spring party, and all the neighbors were coming over at 3:00. There were presents for everyone—16 on and under the table and 14 in the closet. How many in all?

About This Session

Students will most likely need the entire session in the discussion circle to go through all the problems presented—don't worry if there's no time for Work Places. The session's picture problems are intended to provide problem-solving opportunities as well as to spark student's thinking as they move toward creating their own story problems. First, show the picture problems without their talk bubbles. Then, after reading the accompanying story, ask students to select the bubble that best matches the problem situation. The point here is to focus rather intently on these talk bubbles, which serve as a link between the picture and the story and also help students see the difference between a story and story problems.

4 Explain that because the story is long, detailed, and maybe a little hard to remember, you have one more thing to help students understand what problem to solve. Show students the talk bubbles and explain how to use them.

Teacher These shapes here are called math-talk bubbles. We can call them talk bubbles for short. Look at them and tell me what you see. **Students** The talk bubbles use some pictures for words. You can see what you need to find out just by looking at the talk bubbles. There are question marks on some of them. They must be for things you need to find.

- 5 Ask students to find the talk bubble that matches the picture and the story you just shared and then discuss the differences between the story and the talk bubble and the advantages of including both.
 - Attach the talk bubble to the picture.

Teacher Can you find the talk bubble that goes with this problem? Students I see it! It has the same numbers as the problem—16 and 14. It has the same pictures, too. A table and a closet door. Teacher It sounds like a lot of you know just which bubble it is. Let's pull that bubble off the wall and gently fasten it to the picture.



Teacher What do you think?

Hannah Well, it makes things a little more clear. But if we can figure out what to do from reading the story, why should we have a talk bubble too?

Teacher That's a good question. Class?

Ryan I think the story problem would be OK without a talk bubble, but it makes it more clear what to do. Now you can tell just by looking at the picture. It's like, the story is interesting to read, but the bubble tells you what to do with the math.

Teacher What do you mean?

Ryan Well, the bubble just gives you the numbers and tells you what to do with them, without all the story around it. But the story kind of tells why. Like this one said that there was a big spring party with all the neighbors, and stuff.

- 6 Tell students that they will have a chance to solve this problem and a few more like it, but first they need to prepare a problem solving page.
 - Give each student a piece of copy paper, a pencil, and a hard surface for writing.
 - Have each student write his or her name at the top of the page.
 - Fold the page into thirds horizontally as shown in the illustration.
 - Label each section of the page (front and back) from 1 to 6.



- 7 Then invite students to work this first problem in box 1 on their papers.
 - Let them know that it's fine to use sketches, such as rectangles and squares or lines and sticks, or an open number line to model and solve the problem.
 - Show students where and how to access the bundles & sticks or base ten area pieces.

Some students may know the answer immediately while others will need to use manipulatives or draw an open number line to solve the problem. The challenge for all of them will be to show their work on the paper in some fashion. Encourage students to use numbers, pictures, or words to explain their thinking and, if possible, to come up with methods more efficient than counting by 1s.

SUPPORT Some of your students may not be able to think of any other way to figure the answer than by drawing tally marks and counting them up. Allow these students to get an answer using this method, but take time to have other students share more efficient strategies. If you do this consistently, it won't be long before nearly everyone is working in 10s and 1s.

8 Next, have students share their work with a partner, and then as a group, discuss the different methods used to come up with the same answer.

You may want to walk around and look for students who have used efficient methods to share their work.

Teacher Did you get the same answer? Did you use the same method to get it? Students I got 30! We got 30 too. Teacher Did anyone get a different answer? You all agree that it's 30? How did you figure it out? Asa I got the base ten area pieces and put them out like this:

Tools for Modeling Mathematics

In addition to the concrete manipulatives suggested in this session (base ten pieces and sticks & bundles), you might make the Number Pieces App available to students to use in modeling and solving the story problems posed in this session. This app allows students to manipulate base ten pieces and write on the screen. One advantage to these virtual base ten pieces is that students can group units to make strips, and strips to make mats; something that is not possible with the concrete pieces.

This and other resources are listed in the Resources section at the end of the module.



Then I could see I had 20, and then I counted on. It was 30. Tanner I used an open number line—can I show?

Teacher Sure!

Tanner I started with 16 and wanted to add on 14 more. The first thing I did was move 4 more. That got me to 20. Then I needed to jump 10 more to the right. That put me at 30. The answer is 30 presents.



Chase I used numbers. I wrote an equation and figured it out, like this: 16 + 14 = 20 + 10 = 30. I knew that 10 and 10 was 20 and 6 and 4 was 10 and I added them up.

9 Spend the rest of the session working through the remaining five picture problems.

For each problem do the following:

- Have students share a few observations about the picture and then read the story flap.
- Find the matching talk bubble on the board and fasten it to the picture.
- Give students time to work independently on their papers.
- Allow students to share their work with a partner after working independently.
- Select volunteers to share their strategies with the entire group.
- 10 Ask students to turn in their papers and review them as an informal assessment.
 - Make note of those individuals who may need extra support to move toward using strategies more efficient than counting all the quantities by 1s, or counting on, or counting backward by 1s only.
- 11 Finally, post all six Presents & Parcels Picture Problems, with the story flaps showing, in an accessible place for students to refer to over the next few sessions.
 - Students will need these examples as they write their own problems.

Work Places

- 12 If time allows, send students to Work Places for the rest of the session.
- 13 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Give students one last presents and parcels problem to solve mentally and discuss the strategies and solutions.

Teacher Imagine you can see 12 presents on the table. Now imagine that a delivery truck arrives with 32 more presents. How many more presents are in the truck than on the table?

Session 3 Creating Picture Problems, Part 1

Summary

This session is the first of two that challenge students to create their own Presents & Parcels picture problems. In this session, the teacher models how to create a scene by gluing presents and parcels on a background and then considers what kinds of questions she can ask about the picture. The students offer ideas, but a final story problem is not created in this session. The goal today is for students to each create a scene for the story problem they will write next session. Finally, the teacher introduces and assigns the Shopping & Adding Home Connection.

Skills & Concepts

- Solve one-step addition story problems involving situations of putting together (2.OA.1)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums and minuends to 100 (2.NBT.5)
- Explain why strategies for adding 2- digit numbers work, using place value and the properties of operations (2.NBT.9)
- Make sense of problems and persevere in solving them (2.MP.1)
- Model with mathematics (2.MP.4)

Materials

Copies	Kit Materials	Classroom Materials	
Problems & Investigations Creat	ing Picture Problems, Part 1		
TM T9 Presents & Parcels TM T10 Presents & Parcels Picture Problem Background 1 TM T11 Presents & Parcels Picture Problem Background 2	 Presents & Parcels Picture Problems from Session 2 (see Preparation) 	 scissors, crayons, and colored pencils glue or glue sticks clear adhesive tape 3" × 6" pieces of brown construction paper for closet doors (half-class set plus a few extra) 	
Work Places in Use			
 2D Pick 2, Roll & Subtract (introduced in Unit 2, Module 2, Session 4) 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 3D Base Ten Triple Spin (introduced Unit 3, Module 3, Session 1) 			
Home Connection			
HC 79–80 Shopping & Adding			

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

- Make sure the picture problems from Session 2 are on display in the room during the next two sessions. These problems provide valuable examples of good problems for students' reference.
- You may also choose to partially prepare an example of a story problem background of your own before the session begins. Having some presents and parcels already cut out and ready to glue would be a great time saver.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* difference* greater than* left over less than* share sum or total*

Problems & Investigations

Creating Picture Problems, Part 1

1 Gather students in the discussion circle and review the previous session by asking students to talk about the strategies they used yesterday to solve problems.

This discussion can be as simple as an informal listing of methods, but it is an important step in linking the students' experiences with good story problems to the thinking they will do today to create their own story problems.

2 Explain to the students that over the next two days they are going to make picture story problems for each other. Then ask students to share, first in pairs and then as a whole group, some of the things that make story problems interesting, challenging, and fun to solve.

As students share ideas, encourage them to use the examples that are posted from yesterday's work to illustrate the points they are making. Even if the idea that a problem shouldn't be too hard doesn't come up, you may want to use this discussion to set an upper limit on the number of presents students can use in their own problems. You might just simply say that they can use any quantity up to and including the number of presents shown on the Presents & Parcels Teacher Master, which is 107. The limits you establish depend on the strengths and weaknesses of your students, though.

3 Then model the process of creating a picture problem by starting with a background and discussing the process behind completing it.

A few students might prefer to start by writing a problem and making a picture to match, but there is value in making the picture first, so that's the method to model here. Maintain an open dialog with your students and communicate your thinking throughout the process. Use the following sample dialog as a guide.



Teacher This is how I started my story problem. I was thinking it could be my sister's birthday party. She has a birthday coming up soon. I picked a background with a table and a closet. What do you notice about what I have so far?

Cole You have a parcel of 10 presents under the table and 3 more presents on the table. That makes 13.

Amanda The closet is empty. Are you going to put presents in it?

About This Session

While it is tempting to give students blank paper and time to draw their own backgrounds, giving them templates of partially completed backgrounds allows for more time with the mathematics in this session and the next. Have students choose one of the two backgrounds and cut and paste the presents and parcels to save valuable problemsolving time. Two sessions may seem like a long time for creating problems, but as students consider all the possibilities for their own problems, time quickly disappears.

Teacher Yes, I am. I'm ready to put some presents in the closet. Let's say that my mom and dad want to hide some of her presents there as an extra surprise. I'm going to put 2 parcels and 1 more present in the closet.



Amanda There are 21 presents in the closet now. That's a lot of presents! *Teacher* Yes, it is. Maybe she will share with me. Is there anything else you notice about my picture?

Amanda There are more presents in the closet than on the table.

Cole There are 34 presents in the whole picture.

Teacher How did you figure that out?

Cole I just counted what I saw. I started with the parcels. See, 10, 20, 30. Then I counted the other presents. There are 4 of them, and I know that 30 plus 4 is 34.

Amanda That picture is easier to figure out than some of the ones we had yesterday. You can see all the parcels and presents, so you just have to count them.

Teacher You're right! But I like being able to see all of my presents while I'm thinking about my problem. When I'm done I can add a piece of brown paper to hide the presents in the closet.



LaShawn That looks like a door!

Teacher Yes, it does. But I'm not ready to add my door right now so I'm not going to add it. The things you're noticing about my picture are giving me some ideas abut problems I could ask people to solve. I'll have to think about it some more as I keep working. Right now, I'm going to send you out to get started on your pictures. Again, if you're not quite sure what to do, have a look at the picture problems on the board. They might give you some ideas. Remember also that you can't use any more than 107 presents in your problems.

Zach That's a lot of presents!

TeacherThat's how many there are on the Presents & Parcels sheetI'm going to give each of you. Do you have to use all of them?StudentsNo!

- 4 Next, let students know that for the remainder of the session they will each create their own picture problem background scene.
 - Show students where and how to access the materials to make their scenes.
 - To make a picture problem, each student will need:
 - » 1 copy of the Presents & Parcels Picture Problem Background 1 Teacher Master or the Presents & Parcels Picture Problem Background 2 Teacher Master
 - » 1 copy of the Presents & Parcels Teacher Master
 - » 1 piece of brown paper if they want to make a closet door $(3'' \times 6'')$
 - » scissors
 - » glue or glue stick
 - » crayons, colored pencils, or water-based felt pens
 - » clear adhesive tape to fasten the construction paper at one side as a closet door.
 - Circulate as students work, asking them what kinds of problems they have in mind. Some will have things all planned out from the beginning. Others will begin to generate a plan as they go. A few will be perfectly happy cutting and gluing without a thought in the world about posing a story problem. It is not necessary for you or your students to know the exact question you want to ask for your problem today. Just having a completed scene is enough.

SUPPORT If students are having a very hard time getting started, encourage them to use your example or one of the examples around the room as a starting point. Students can copy your ideas, although they'll need to change the numbers and find other ways to make their problems different than yours.

5 At the end of the session, have students collect their cut pieces and pile them on top of their background papers.

Be sure they label these background papers with their names so you can distribute them easily tomorrow. Also, keep the background scene you created today for use during tomorrow's session.

Work Places

- 6 Students who finish their scenes early can go to Work Places while other students finish.
- 7 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Invite students to share with a partner some of the ideas they have for their story problems.

🕮 Home Connection

- 8 Introduce and assign the Shopping & Adding Home Connection, which provides more practice with the following skills:
 - Solve two-step addition and subtraction story problems with sums and minuends to 100 involving situations of adding to and taking apart, with unknowns in all positions (2.OA.1)
 - Fluently add and subtract with sums and minuends to 100 (2.NBT.5)
 - Add three 2-digit numbers (2.NBT.6)
 - Solve money story problems involving quarters, dimes, and nickels (2.MD.8)

Session 4 Creating Picture Problems, Part 2

Summary

The teacher reviews the scene created during yesterday's session and students generate several problems that might be posed by looking at the picture. The teacher selects one problem, writes a story to support it, and creates a talk bubble to glue onto the picture. Then the students finish their own picture problems, write their stories, and add talk bubbles, question marks, and other needed clues. After the session, the teacher types each student's story and prepares the problems for problem solving activities in the remaining sessions of the module.

Skills & Concepts

- Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
- Make sense of problems and persevere in solving them (2.MP.1)
- Model with mathematics (2.MP.4)

Materials

Copies	Kit Materials	Classroom Materials	
Problems & Investigations Creating Picture Problems, Part 2			
	 Presents & Parcels Picture Problems from Session 2 (see Preparation) large base ten area pieces 	 teacher-created scene from Session 3 half-sheets of lined paper (1 for display plus class set) white construction paper (see Preparation) glue or glue sticks student-created scenes from Session 3 supplies used to create scenes in Session 3 	
Work Places in Use			
 2D Pick 2, Roll & 2E Steps & Leaps 3A Star Power (ii 3B Five in a Row 3C Hit the Zone 	Subtract (introduced in Unit 2, M s (introduced in Unit 2, Module 3, ntroduced in Unit 3, Module 1, Se (introduced in Unit 3, Module 1, (introduced in Unit 3, Module 2, S	lodule 2, Session 4) Session 3) Session 3) Session 5) Session 4)	

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

- Make sure the pictures problems from Session 2 are on display in the room today. These problems provide valuable examples of good problems for students' reference.
- Create a class set of blank talk bubbles by cutting rounded rectangles (approximately $2'' \times 3''$) from white construction paper.
- Have a plan in place for preparing student story problems for Sessions 5 through 7 in this module (see Notes below).

Notes

One of the most powerful ideas in the entire module comes to light in this session: the idea that there are a number of different problems that can be written to match a particular picture. Students discover through their own work and later as they solve problems, that the same picture can be used to create problems ranging from easy to solve with mental math to very challenging situations requiring multiple steps, and sometimes multiple tools.

Vocabulary An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* difference* greater than* left over less than* share sum or total*

Be open to hearing what students have to share as you discuss potential story problems to accompany the scene you created in Session 3. You may choose to select an idea generated by the students or come to class with an idea that is different than any the students have already experienced. Don't be afraid to pose a problem that is more challenging than any presented in the picture problems provided. Students who are struggling with this session sequence tend to replicate one of the simpler problems from Session 2, which they can see, so you will most likely not lose anyone.

Take time to motivate students to devise problems that are truly problems. During today's whole-group discussion, and as you circulate talking with students about their problems, continue to remind them that if something is truly a problem, it should take more than a few seconds to solve. Sometimes making a small change to the numbers in a problem or re-framing the problem using a door to hide some of the elements (such as presents and parcels in the closet or in the delivery truck) can make it more challenging.

The flip side of this idea is some students who will pose problems that are so complex that they can't even solve them. To alleviate these concerns, discuss the following criteria with students:

- They must be able to solve their own problems.
- At least one other person in class has to be able to understand and solve their problems.
- The problems have to be challenging (bearing in mind that students' ideas of challenges depend on their own skill levels).

To Prepare for Sessions 5–7

In the remaining sessions of the module, students spend time solving problems created by their peers. To prepare, type a large copy of each student's story problem to serve as a story flap and about ten smaller copies for students to use as they solve one another's problems.

Here's one relatively easy way to accomplish this task:

- 1 Make sure you can read each student's story problem before you sit down to type. If you have any trouble reading a problem, save creating the story flap for that problem until after you can get clarification from the writer/student.
- 2 Type the text of each story problem in bold lettering, font size 14, in a single document. Correct student's spelling, punctuation, and grammar as you see fit. The goal is to make the story portion of each problem as legible as possible. As you end a story problem, press the space bar three times, type the student's name, and press return two or three times to leave several spaces between one story problem and the next.
- **3** When you're finished typing each problem, double-check to make sure each problem, along with the author's name will appear on the same page. Run spell-check, proofread, and print out a copy of the entire file. Save the file, then run 10 copies of the pages you printed. Cut the problems apart for use in Sessions 5, 6, and 7. (See Step 6 below.)
- **4** Now go back to your computer file and change the page setup to landscape. Enlarge the text to font size 36 bold. Check through before you print again to make sure that you haven't cut someone's problem off in the middle of the page. Re-space as necessary and print out one copy of the document.
- **5** Cut these large-font stories apart and tape them to the bottoms of the corresponding picture problems.
- 6 As mentioned in Step 3, run 10 copies of the sheets of small text and cut the copies apart. File your hard-copy master in case you need more copies of the problems later. Group the strips by problem and put each group of 10 into a half envelope labeled with the problem creator's name. That is, 10 copies of Briana's text go into a half-envelope labeled with her name. (To create a half-envelope, lick the flap of a legal sized envelope, seal it, and then cut it in half widthwise.)
- 7 Post each picture problem on the wall with its envelope of small strips directly beside it.



Problems & Investigations

Creating Picture Problems, Part 2

- 1 Gather the students into your discussion circle and explain that today they're going to finish their story problems, including writing the problem that goes along with the picture.
- 2 Show your picture problem from yesterday and ask students to think about some of the problems you could possibly pose and how you could ask them.

Teacher Here's my picture from yesterday. I've done some more thinking about it. What are some of the problems I could pose with this picture? What could I ask other people to figure out about it?



Devon They could figure out how many presents there are in the whole picture.

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Teacher Yes, but I'm worried that asking a question that could be answered so quickly by just counting the presents and parcels in the picture wouldn't truly be a problem. It can be solved too quickly. What can we do to make it more challenging?

Suki You could tell them that your sister is going to give away 21 of the presents and have them figure out how many would be left.

José I respectfully disagree with you, because you can see the answer in the picture! Look! If you cross out the presents in the closet—there are 21 up there—you can see that there are 13 left around the table.

Suki Oh, yeah.

Teacher I've been thinking maybe I'll ask people to compare the number in the closet and on the table.

Tasha But you can see that there's more in the closet than on the table.

Teacher You're right, but I'm going to ask them to find the difference between the two numbers. Let me think how I want to write my story. Let's see—I'll write it here on my piece of lined paper so you can see it. "Leslie was having a big party for her sister's 21st birthday. She had 13 presents for her sister on the table and 21 presents hidden in the closet. 'Hmm,' she thought, 'I wonder how many more presents there are in the closet than on the table.' Can you help her?"

Sara Sure! It's 12!

Teacher How did you figure that out?

Sara I remember you have to subtract to find the difference—20 take away 10 is 10, and 1 take away 3 is 2. So the answer's 12!

Teacher Does everyone agree? Sara says the difference between 21 and 13 is 12. Talk with the person next to you for a few moments, and then let's hear some responses.

Students No! It's not 12. That's too many!

Tanisha I respectfully disagree. There aren't 12 more in the closet. Thirteen is too close to 21.

Everett I know what it is! It's 8 because 13—14, 15, 16, 17, 18, 19, 20, 21. I counted up on my fingers and it's 8 more!

3 Then decide on a problem and model the process for writing the story and the accompanying talk bubble that summarizes the problem.

- While your discussion will depend on the problem you create, you will want to be sure to communicate the following goals to the students as you model each step:
 - » Finish your picture.
 - » Make a final decision about the problem you're going to pose and write a story that poses the problem. Use a half-sheet of writing paper for the problem and glue it to the back of the picture problem when you're finished.
 - » Create a talk bubble to give other people a shorthand clue about what they need to solve.
 - » Glue the talk bubble to your picture.

Teacher I can tell that this is a challenging problem! I'm going to finish up here and let you go off to work. If you want to solve my problem later, I'll put it up on the wall with the rest of them. So, now I have my picture and my story. I need one more thing, and that's some kind of problem clues in my picture.

Maya You mean the talk bubble?

Teacher Exactly. Those bubbles let people know what the problems are before they even read the stories. Then the stories give them a little more detail. I want to make the clues in my picture as simple as possible so I don't have to write all over my artwork. Let's see. First I'm going to draw a person in the room. Then I'm going to put a thinking bubble by her head that shows the problem.



CHALLENGE If you want to present your students with a greater challenge during this discussion, perhaps motivating them to pose more challenging and engaging story problems than they might otherwise, try something like this alternate discussion.

Teacher (Displays the same scene.) I was thinking that I wanted to create a problem where the answer wasn't something you could see right away. I want to make it so you can't just count the presents on the page to get the answer. Any ideas?

Maya You could hide the presents that are in the closet behind a door. *Teacher* That's a good idea. If I do that, what information will I need to give in my problem so that other people can work with my picture?

Amanda We need to know how many presents are in the closet.

Brent Or you could tell how many there are in all.

Teacher How will that information help?

Brent If you know how many there are in all and how many are on the table, you can figure out how many are in the closet.

Teacher OK, let's write a problem knowing we will cover up the presents in the closet with a door. How about this: "Leslie was having a big party for her sister's 21st birthday. She had 34 presents to give her sister, and 13 of the presents were on a table. The rest of the presents were in the closet. 'Hmm,' she thought, 'I wonder how many more presents there are in the closet than on the table.' Can you help her?" **Marc** That looks tricky. You have to do two different things to get the answer.

Teacher What do you mean?

Marc First you need to figure out how many presents are in the closet. Then you would need to compare them.

Teacher Is that OK? Does it make the problem too hard?

Ian I don't think so. It just takes more steps.

Teacher Let's use this problem. How can I make a talk bubble for it?

Ian You need to show that there are 13 presents around the table, 34 presents in all, and you want to know how many more are in the closet. Teacher Let's do something like this.



- Then explain what students need to do when they finish writing their own 4 picture problems and talk bubbles.
 - Read the problem over to be sure it makes sense.
 - Be sure they can solve the problem themselves.
 - Share the picture problem with another student.
 - Have that student examine the picture to see if he can figure out what the problem is, and then read the story to see if he's right.
 - Then find out if he can solve your problem using bundles & sticks, base ten area pieces, • sketches, or numbers.
 - If he can't solve your problem, work together to revise it so that it can be solved.
 - Get help from the teacher if neither of you can figure out how to fix the problem.
- 5 Give students the pictures from the previous session and then give them the rest of the session to complete their problems.

ELL Encourage students to write their story problems in the language they are most comfortable using. Work with the student or another teacher to translate the story for display.

SUPPORT If students struggle to create their bubbles, or are not sure where to put a question marks, talk to them about the idea of the bubbles being a shorthand bridge between the long story problem and the picture they created. Have them take a look at the example problems posted in the room for inspiration.

Work Places

- Students who finish their scenes early can go to Work Places while other 6 students finish.
- 7 Close the session.
 - Have students clean up and put away the Work Place bins.

Note

Remember that you need to prepare students' completed problems for work in Sessions 5-7 following the guidelines provided in the Preparation section.

Session 5 Solving Student-Posed Story Problems

Summary

Before this session, the teacher goes through the students' completed picture problems from the previous two sessions and selects two or three for the class to work on together. As each of these problems is presented, students work to show their strategies and solutions on paper. Then they share their thinking with others in the group. The teacher introduces Work Place 3E Target Twenty by playing the game with the class. Students then play the game in pairs once or twice as time allows. Finally, the teacher introduces and assigns the Solving Presents & Parcels Story Problems Home Connection.

Skills & Concepts

Materials

- Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
- Fluently add and subtract within 20 using mental strategies (2.OA.2)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Explain why strategies for adding and subtracting 2-digit numbers work, using place value and the properties of operations (2.NBT.9)
- Represent whole-number sums and differences within 100 on a number line diagram (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Construct viable arguments and critique the reasoning of others (2.MP.3)

Copies	Kit Materials	Classroom Materials	
Problems & Investigations Solving Student-Posed Story Problems			
	 large base ten area pieces (see Preparation) craft sticks (see Preparation) 	 teacher-created master (see Preparation) hard surface for writing (such as a clipboard or a whiteboard) 	
Work Places Introducing Work Place	3E Target Twenty		
TM T12–T14 Work Place Guide & Instructions 3E Target Twenty TM T15 3E Target Twenty Record Sheet	 15 decks of Number Cards, wild cards removed 	 scratch paper, class set student number racks (optional) 	
Work Places in Use			
 2E Steps & Leaps (introduced in Unit 2, Mo 3A Star Power (introduced in Unit 3, Modu 3B Five in a Row (introduced in Unit 3, Modu 3C Hit the Zone (introduced in Unit 3, Modu 3D Base Ten Triple Spin (introduced Unit 3) 3E Target Twenty (introduced in this session) 	odule 3, Session 3) ule 1, Session 3) dule 1, Session 5) dule 2, Session 4) 3, Module 3, Session 1) on)		
Home Connection			
HC 81–82 Solving Presents & Parcels Story Problems			

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* difference* greater than* left over less than* share sum or total*

Preparation

Sticks & Pieces

Some students will need access to craft sticks bundled into sets of 10 and individual sticks to help solve today's problems. Others may prefer to use the tens and ones pieces from the set of large base ten area pieces. Consider making several baskets of each type of material (bundles & sticks and base ten area pieces) for students to use while working.

Teacher-Created Master

- Go through students' completed problems from Session 4 and select two or three problems that seem moderately challenging.
- Type the text of each onto a single piece of paper as shown here, and run a class set.



Work Place 3E

In today's session, you'll introduce Work Place 3E Target Twenty. Before this session, you should review the Work Place Guide and Work Place Instructions and assemble the bin for Work Place 3E (which replaces Work Place 2D Pick Two, Roll & Subtract), using the materials listed on the guide. The Work Place Guide also includes suggestions for differentiating the game to meet students' needs.

Problems & Investigations

Solving Student-Posed Story Problems

1 Ask students to join you in the discussion area with their pencils and a hard writing surface, such as a clipboard or whiteboard. When all have arrived, congratulate them on their hard work creating story problems. Take a minute to ask students if they prefer being story problem creators or solvers and why.

You may want to hold up each picture problem for everyone to admire. This will give students a nice preview of what is to come.

2 Explain that during the next two sessions, the students will have an opportunity to choose and solve story problems created by their classmates. But before you send students to work on their own, you want everyone to work on a couple of the problems together.

Reassure students whose problems are chosen for this warm-up that their work will be available for others to choose during individual problem solving time.

- 3 Give each student a copy of the story problem master you've prepared. Explain that you'll be reading each problem together, taking time to work, and then sharing solutions and strategies with one another. Then outline your expectations for how students are to show their work.
 - Explain that the person who wrote each problem will be very curious to know exactly how their classmates solved it, so writing the answer alone won't be adequate. Instead, students should use numbers, sketches, and words when appropriate to show their thinking, and be sure to circle the answer when they're finished.
 - Remind students that they can sketch an open number line and use labeled hops to solve some of these problems. They can also use quick sketches of parcels and presents, bundles & sticks, or tens and ones pieces from the set of large base ten area pieces. Ask them to label their sketches so others can understand their thinking.
 - Let students know that it's fine to use manipulatives to help solve these problems, and show them where and how to access the baskets of bundles & sticks and base ten area pieces you've prepared for this session.
- 4 Now display the first picture problem you've selected and lead students in reading and solving the problem.
 - You can read the problem, or you can have the student who wrote the problem read it. The words will be on everyone's page, so you might even have the whole class read together.
 - Give any clarification needed and let students go to work. Encourage them to share strategies as they work, and circulate to assist as needed.

Teacher What does the first problem on your page say? **Students** Dad ordered 51 presents for the party. 27 of the presents are already on the table. The rest of the presents are still in the delivery truck. How many presents are in the truck?

Zane It says I wrote that one!

Teacher What could you do to solve this one?

Maya If you know how many there are in all and how many you already have, I think you need to subtract to find out the answer.

Roger I don't think I can subtract 27 from 51 in my head.

Teacher What tools do you have available to you to help? Remember that as you work, you can use many different tools.

Raul We can use base ten area pieces. It takes 5 tens and 1 one to make 51.



Cole How can we take 27 from that? There is only that one little square, and we need to take away 7.

Tanisha You can trade one of the tens pieces for 10 ones, like this.



 \leftarrow

27

Teacher How can you quickly sketch these pieces on your paper to show your work?

Shane We can use that fast way we've talked about before. You use lines for the strips of 10 and dots for the pieces to show 1s.



Shane And then you can mark off 27 of the pieces by crossing out two lines and seven dots.



Student That leaves two lines and four dots. The answer is 24!

Teacher Yes, I see what you did, and I like how you used a faster way to show your pieces. Does anyone have any ideas how we could use the open number line to get the same answer? How would we start? **Ayisha** Sure! You could draw your line and show 27 because that's how

many presents you already have. Then you can put 51 on the line because that's how many there are in all. But now I'm not sure what to do.

Teacher How do you get from 27 to 51? Tell me what you would do. Ayisha OK, I see. You need to take steps and leaps from 27 to 51. That will give you the answer. I'll step up 3 to get to 30, then I can leap by tens to get to 50. To finish, I only need to step up 1 more to 51.

|0 + |0 + 4 = 24

 \Rightarrow

51



Teacher And how does that tell you the answer?

Ayisha The steps and leaps are the answer. I took 2 leaps of 10 and 4 steps in all. It is 24, just like when we worked with base ten area pieces.

SUPPORT Not all of your students will be ready to move beyond by 1s counting, but some who might not have considered it will be able to take the lead of their classmates and begin to think in terms of 10s and 1s in this setting. Sometimes simply asking students to find a faster way to do something is enough of a nudge.

CHALLENGE When appropriate, challenge students to solve the same problem using more than one method. In the example above, the solution could have been found on the open number line by starting at 51 and moving left (or subtracting) 27. You might ask students to solve the same problem in two different ways to double-check their work.

- 5 When most students appear to have something down on paper, take a few minutes to share solutions and strategies.
 - Ask students to share their answers first. List any and all responses on the board.
 - Have a few students share their strategies at the board or easel.

• Encourage students to compare and contrast the strategies that are presented, with an eye to those that are particularly effective and efficient.

Hearing the answers, whether alike or different, seems to motivate students to listen to one another's strategies. The sketches and equations some students have generated will help others see how to show their thinking. A picture may be particularly instructive for a student who's locked into numbers and equations will become useful shorthand tools for students who are still learning how to use them. Students are often fascinated to see how many different approaches there are to a single problem, and how many different ways there are to communicate one's thinking. We encourage students to add ideas to their own papers as other students are presenting their methods. "If you see a picture or a number sentence that seems to capture your thinking, add it to your own paper," we tell the group. In this way, students continue to learn how to communicate their ideas both orally and in writing.

- 6 Repeat the steps above with the other one or two problems you've chosen for the day's work.
- 7 When the class has all the problems on the sheet, ask students to turn in their papers so you can look them over as an informal assessment.
 - Make note of those individuals who may need extra support to move toward using strategies more efficient than counting all the quantities by ones, or counting on or counting backward by ones only.
 - Let students know that they will have a chance to choose and solve more of their classmates' story problems next session.
 - If it comes up, let students know that they will be able to choose and solve their own story problems, as long as they're willing to show all their thinking on paper.

🖄 Work Places

Introducing Work Place 3E Target Twenty

- 8 Tell students that you will be showing them a new Work Place game. Explain that they will play the game as a class today, but they will not have time to go to Work Places today.
- 9 Ask students if they can think of three numbers between 1 and 10 to add together to get a sum of 20. Have students share their addends, and record some examples on the board (e.g., 7 + 4 + 9 = 20; 5 + 6 + 9 = 20, 5 + 5 + 10, and so on.)

Let students know that the same number can be used more than once.

- Explain that the goal of today's Work Place game is to make a sum that is as close as possible to 20, or exactly 20 if possible.
- 10 Summarize the game.

Players take turns drawing 5 cards from a deck and then each choosing three of the cards to add together to get as close as possible to 20. Players then find the difference between their score and 20. The winner is the player with the lowest score after five rounds.

- 11 Then display the 3E Target Twenty Record Sheet and play the game against the class, using the Work Place Instructions 3E Target Twenty Teacher Master as needed.
 - Call a volunteer up to take turns with you drawing cards from the top of the deck until you each have five cards. Explain that the cards the volunteer drew are for the class to use when it's their turn. Set them aside, and display your five cards so the students can all see them.

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- Ask students to find several possibilities for your cards and compare the scores.
 - » Encourage them to use scratch paper and any addition strategies they can apply. Have them use their own number racks to help if they like.

Here are some of the possible combinations that can be made with three cards out of the five cards drawn (5, 6, 6, 8, and 9).

Addend	5	5	6	6
Addend	6	6	6	8
Addend	6	8	8	9
Sum	17	19	20	23
Score	3	1	0	3

• Discuss which three numbers are the best choice for the round and record your equation and score on line 1 in the "First Game" section of your record sheet for everyone to see.

The best choice is always the set of three numbers whose sum is closest to 20.

- Remove your cards from view, display the students' cards, and have students complete their part of the round.
 - » Students can work in pairs to discuss which would be the best group of three numbers to form their equation.
 - » Ask several volunteers to share the numbers they chose and describe the strategy they used for finding their sum.
 - » When the class has agreed on three numbers, their sum, and their score, write this information on line 1 in the "First Game" section of the students' display record sheet.
- Continue playing until all the lines for "First Game" are full, and then have students add up their final score and yours to see which score is lowest and won the game.

12 Next, invite students to play the game in pairs for the remainder of the session.

- Give each pair a deck of Number Cards and two copies of the 3E Target Twenty Record Sheet Teacher Master.
- Have students who finish Game 1 before the end of the session go ahead and start the second game, using the lower half of the record sheet.

Note If you have more than 30 students, have a few of them play the game in groups of three instead of in pairs.

Home Connection

- 13 Introduce and assign the Solving Presents & Parcels Home Connection, which provides more practice with the following skills:
 - Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
 - Model and describe division situations in which sets are separated into equal parts (supports 2.OA)
 - Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
 - Make sense of problems and persevere in solving them (2.MP.1)

Session 6 Shopping for Story Problems

Summary

Today the teacher models the procedure for choosing and solving story problems from the collection the class has generated. The students then leave the discussion area a few at a time to shop for problems themselves. They select and work one problem at a time, completing as many as they can during this session. Shopping will continue in the next session. The work from these sessions can be scored and saved as a Work Sample.

Skills & Concepts

- Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Explain why strategies for adding and subtracting 2-digit numbers work, using place value and the properties of operations (2.NBT.9)
- Represent whole-number sums and differences within 100 on a number line diagram (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Attend to precision (2.MP.6)

Materials

Copies	Kit Materials	Classroom Materials
Assessment Shopping for	r Story Problems Work Samp	le
	 large base ten area pieces (see Preparation) craft sticks (see Preparation) 	 students' story problems from Session 4 (see Preparation) small envelopes, cut in half, containing reduced copies of the problem text pinned up beside each story problem (see Preparation) 100–200 half-sheets of copy paper glue or glue sticks

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

Sticks & Pieces

Some students will need access to craft sticks bundled into sets of 10 and individual sticks to help solve today's problems. Others may prefer to use the tens and ones pieces from the set of large base ten area pieces. Consider making several baskets of each type of material (bundles & sticks and base ten area pieces) for students to use while working.

Students' Story Problems

The following steps should have been completed after Session 4 to prepare students' story problems for this session and the next:

- Type the text of each student created problem in bold lettering with font size 14. Space about three lines between each problem.
- Run about 11 copies of these problems and cut them apart. Place multiple copies of the same problem in a half envelope and label the envelope with the name of the student who created the problems.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

compare* difference* greater than* left over less than* share sum or total*

- Unit 3 Module 3 Session 6
- Return to the file that contains all the student-created problems and change the font to size 36.
- Print one copy of this file, cut out the problems, and tape them below the corresponding picture problems.
- Create a display for each student's problem similar to the one shown here, using the picture, large font problem, and the half-envelope of small problem strips. Line these displays along a wall at student level.



Assessment

Shopping for Story Problems Work Sample

1 Gather students in the discussion circle to talk about expectations for the next two sessions. Explain that today and tomorrow, they're going to have a chance to choose the story problems they want to solve. Tell students you want them to think of this activity as shopping for a story problem.

You may want to ask students to talk about how choosing a problem is like shopping in a store.

- 2 Explain the shopping process step-by-step so students will know exactly what to do when they go out to work.
 - Let them know that they will need to:
 - » Walk around the room and look at all the problems.
 - » Read several problems and choose one to work.
 - » Take a strip from the envelope beside the problem and take it back to your desk. Glue the strip to the top of a half-sheet of copy paper.
 - » Solve the problem, showing your work.
 - » Sign the paper at the bottom to show it is your work.
 - » Turn in your paper when you are finished, and start again with another problem.
- 3 Then demonstrate each step of the process as students watch.
 - Start your shopping by walking along the wall and stopping in front of a problem that would be moderately challenging to many of the students.



See the Unit 3 Assessment Guide at the end of the unit for scoring guides, answer keys, and intervention suggestions.

Take time to vocally admire all the wonderful picture problems and to note that while it's so hard to choose, you know you'll have a chance to solve more of these problems later.

- Read the problem you've selected aloud, and then take one of the small strips out of the envelope beside the problem.
- Bring the small strip back to the discussion area.
- Take a half piece of copy paper and glue the small strip to the top of your paper.

There were 25 Valentine's Day presents in the mailbag. When the delivery person picked up the bag to take it to Room 19, 9 of the presents fell out of the bag. How many were left? by Ali

- 4 Next, work with input from students to solve the problem you choose.
 - If possible, generate a strategy with the students that uses one of the base ten models (large base ten area pieces or bundles & sticks) and a second strategy that uses the open number line.

Teacher This is an interesting problem. I think I'll use the base ten area pieces to help figure it out. How can I set out 25?

Megan Just put out 2 strips of tens and 5 of the little squares.



Teacher So here are base ten area pieces to represent the 25 presents. Now what happened in Ali's story?

Amanda Nine fell out of the bag.

Sean Just take 9 away.

Monique I agree with you and I see a real easy way to do that.

Teacher But how can I take 9 away when I only have 2 tens and 5?

Monique Trade in 1 of the tens strips for 10 single ones pieces—it's like cutting open the parcel and taking the 10 presents out.

Teacher That sounds like a good plan. I can pretend I'm cutting open a parcel so there will be lots of loose presents and 9 can fall out.



Carlos Now you can take 9 away.

Teacher Sure, and how many do I have left now?



Students 16!

Elisa I already knew that.

Teacher How did you know?

Elisa Because taking away 9 is almost like taking away 10, except 1 less. 25 take away 10 would be 15, so 25 take away 9 would be 16.

Teacher Can you show us that idea on an open number line?

Tools for Modeling Mathematics

Consider using the Number Pieces app to model the use of base ten pieces in solving the problem you've chosen. You might also make the app available to students, in addition to concrete manipulatives, to use in solving some of the problems they select, starting in step 7.

This and other resources are listed in the Resources section at the end of the module.

Elisa Sure. First you start at 25. Then you jump back 10 to 15. But you didn't really want to jump back 10. You wanted to go back 9. So you step back up 1 to 16, right?



Teacher That's another good strategy, and one I could show on my problem-solving paper very easily. How might we show the work we did with base ten area pieces on our problem-solving paper?

Cameron You could draw a picture of what you did with the parcels and presents.

Teacher Good idea! I think I'll use boxes for the parcels and just use tally marks for the individual presents.



Teacher What do you think? Do you think I wrote enough for Ali to understand what I did?

Suki You forgot to put the answer.

Shawn She might not understand your picture. Maybe you should write some words to explain what you did.

Cole You could have an equation too, like 25 - 9 = 16*.*

Teacher OK. I'll try adding some of your ideas and see what Ali thinks.



5 Now review your work with the class to check your answer, and to ensure that it's clear enough for someone who wasn't a part of the discussion to understand.

Emphasize the idea that this is almost like writing a letter to the student that wrote the problem. You really want her to understand how you figured things out. She already knows the answer to her own problem; what she doesn't know is how other people are going to solve it.

6 Finally, make sure your name is on the paper, and put it in the classroom location you have designated for completed work.

Emphasize the importance of writing your name on the paper, so that the person who wrote the problem will know who solved it.

- 7 Once you've modeled the entire procedure, review the steps to completing a problem one more time and send students out a few at a time to shop. Before you send them out to work, remind students to:
 - Find a problem they want to solve (even their own is OK).
 - Take the story problem strip from the envelope next to the picture problem.
 - Return to their desks to glue the strip to the top of a half-sheet of paper.
 - Record solutions and strategies as clearly and fully as they can below the problem.
 - Sign their name.
 - Put the paper in a designated place for completed work.
 - Shop for another problem.

ELL If students have trouble reading a problem, encourage them to examine the talk bubble for clues as to what they're supposed to do. If that doesn't work, suggest that they ask the student who wrote the problem to read it to them.

SUPPORT Be prepared to have two or three problems in mind to suggest to students who may have trouble choosing, or may have trouble solving some (perhaps most) of the problems posed by their classmates. You may even want to have one problem in mind to work with a smaller group of students as you send other students out to shop.

- 8 Close the session.
 - Collect any half-finished papers and remind students that they will have more time tomorrow to shop for problems.
 - Give students time to share one good thing they noticed about another student's work.

Notes

To prepare for the second day of shopping in Session 7, gather all the papers the students completed this session and sort them by the names of the students who wrote the problems. Note that it is important to sort by the problem writer and not the problem solver. Once you've sorted the solutions, go through to find out if there are any problems that haven't yet been solved. If such is the case, re-hang these problems in more accessible locations and label them with sticky notes to signal that they need some responses.

You might also want to glance through the papers for errors and misconceptions. If you spot papers that indicate confusion, pull them out and meet with those students during the next shopping session to provide some individual help.

If you plan to use students' solutions as work samples, be sure to save all the completed papers from this session and the next. When students complete their work in the next session, you will choose the best four pieces of work from each student to save as work samples. You will find resources for scoring students' work and recording the class set of results in the Assessment Guide.
Session 7 Unit 3 Post-Assessment

Summary

Students complete the Unit 3 Post-Assessment today. As they finish and turn in their assessments, they return to shopping for story problems as they did in Session 6. Finally, the teacher introduces and assigns the Shopping & Subtracting Home Connection.

Skills & Concepts

- Solve one- and two-step addition and subtraction story problems involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions (2.OA.1)
- Skip-count by 5s and 10s within 1000 (2.NBT.2)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 100 (2.NBT.5)
- Add three 2-digit numbers using strategies based on place value and properties of operations (2.NBT.6)
- Explain why strategies for adding and subtracting 2-digit numbers work, using place value and the properties of operations (2.NBT.9)
- Solve addition story problems with sums to 100 involving lengths given in the same units (2.MD.5)
- Represent whole numbers as lengths on a number line (2.MD.6)
- Represent whole-number sums and differences within 100 on a number line diagram (2.MD.6)
- Make sense of problems and persevere in solving them (2.MP.1)
- Attend to precision (2.MP.6)

Materials

Copies	Kit Materials	Classroom Materials					
Assessment Shopping for Story Problems Work Sample, Continued							
TM T16-T19 Unit 3 Post-Assessment	 large base ten area pieces (see Preparation) craft sticks (see Preparation) 	 students' story problems from Session 4 (see Preparation) half envelopes containing reduced copies of the problem text pinned up beside each story problem (see Preparation) 100–200 half-sheets of copy paper due or due sticks 					
Home Connection							
HC 83-84 Shopping & Subtracting							

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

Unit 3 Module 3

Session 7

compare* difference* greater than* left over less than* share sum or total*

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Preparation

Sticks & Pieces

Some students will need access to craft sticks bundled into sets of 10 and individual sticks to use during the post-assessment or help solve the Presents & Parcels story problems. Others may prefer to use the tens and ones pieces from the set of large base ten area pieces. Consider making several baskets of each type of material (bundles & sticks and base ten area pieces) for students to use while working.

Students' Story Problems

- If any of the problems have run out of reduced copies of the text in the half-envelope, do not refill the envelopes. This will help insure that responses are more evenly distributed among all the problems in the class.
- If you did not already do so at the end of Session 6, sort through completed problems to check that all problems have been attempted. If you find that one or more problems have not been attempted, re-hang them in more accessible places and mark them with sticky notes.

Note

It is important to prepare students for returning to shopping for problems as they did in the previous session before beginning the assessment. Students who finish the assessment before others need to know how to continue with shopping and solving the presents and parcels problems without having to wait until the whole class finishes.

If you did not mark problems that should be worked by more students at the end of yesterday's session, you will need to mark them today before students begin shopping for problems. You will want as many students as possible to attempt each problem.

The work students do today need not mark the end of the their time shopping for problems. See action step five below to get ideas for extending the valuable learning in this module. Students will certainly want to have a chance to see how their classmates solved their problems, so have a plan in place to allow them to read solutions. One idea is to gather all the solutions after a couple of weeks, sort them, and give them to the problem authors to take home and read. Another suggestion might be that after the students have had more time to shop and solve, you could post all the problems, along with selected solution papers, out in the hallway for other students, parents, and teachers to examine and admire.

Taking time to give students an opportunity to look over responses and think about which ones are clear and which ones are more difficult to comprehend, will help them develop their own clear problem-solving voices. You may want to give students time to put together a set of class guidelines for communicating strategies and solutions effectively.

Assessment

Shopping for Story Problems Work Sample, Continued

- 1 Gather students in the discussion circle to introduce today's activities.
 - Tell students that they will take a unit post-assessment today.
 - Then they will have time to shop for more story problems once they turn in their assessment.
- 2 If you found that there were some problems that had not been solved by anyone, explain that you have chosen some problems to be featured today. Tell students you have re-hung these problems and marked them with sticky notes. Let students know that you want more of them to try these problems today.
- 3 Then ask the students to tell you the steps to solving the problems one more time.
 - Find a problem they want to solve (even their own is OK).
 - Take the story problem strip from the envelope next to the picture problem.
 - Return to their desks to glue the strip to the top of a half-sheet of paper.
 - Record solutions and strategies as clearly and fully as they can below the problem.
 - Sign their name.
 - Put the paper in a designated place for completed work.
 - Shop for another problem.

SUPPORT You may also want to model solving an entire problem one more time.



See the Unit 3 Assessment Guide at the end of the unit for scoring guides, answer keys, and intervention suggestions.

- 4 Let the students know where to get their half-finished solution papers from the previous day, or pass them out as the students are working on their assessment. Students who did not have half-finished work can begin shopping for new problems as soon as they complete the assessment.
- 5 Then transition into the post-assessment by displaying a copy of the Unit 3 Post-Assessment Teacher Master and distributing a copy to each student.
 - Model on your copy how to label the first page of the assessment with name and date.
 - Give students a minute to look over the entire assessment quietly.
- 6 Read and review the problems with the class, clarifying as needed.
 - Here are some things to be aware of as you review each of the problems with the class:
 - » As you review the first two problems with the class, you may need to remind students how to draw and label the length of their jumps by using arcs above the number line, and how to label the numbers on which they land on the number line itself. If so, model the process in a manner similar to what's described here.

Teacher To do problems 1 and 2, you're going to have to make and label jumps along the number line like we've been doing for the last few weeks. Let's do a quick example together. I'm going to draw an open number line on the board and label it with 0 at the left-hand side. Then suppose I want to make a jump of 15 and then another jump of 24 and see where I land. First I'll make the jump of 15. I'll label the jump, and also the place I land on the line.



Teacher Now I want to make a jump of 24, but do I have to make the whole thing at once? I could, but I think I want to make it easier, so I'm going to break it into pieces that are easy to add on to 15. Let's see... I'll go 10 more and label my jump. Where have I landed on the line? What's 15 plus 10?

Students Twenty-five.

Teacher OK, I'll take another jump of 10 and now I'm on what? Help me out so I can label where I landed on the line.

Students Thirty-five.

Teacher So I've jumped 20 of the 24. Now I think I can make the last jump of 4. Where have I landed on the line? What's 35 plus 4 more? **Students** Thirty-nine!



» When you review problem 3 with the class, help students understand that they have to take jumps of 5, 10, and 20 to go from 0 to 115. They have to use at least one jump of each length, but they can use the lengths in any combination to get to 115. Help them understand that they have to draw an arc to show each jump, and label the jump with its length. They also have to label each number they land on along the line until they reach 115.

 \rightarrow

- » When you review problem 8 with the class, help students understand that they have to find the mark along the number line that shows each of Sara's lucky numbers and write the number below the mark on the number line.
- 7 Before students start to work, remind them to:
 - Work independently.
 - Raise their hand if they have a question.
 - Try to answer all the problems, even those they don't fully understand.
 - Explain how they solved a problem when directed to do so. Encourage them to use pictures, numbers, and words in their explanations.
 - Use the bundles & sticks or base ten area pieces if needed to help solve some of the problems. (Let students know how and where to access these materials, or simply set a basket of each manipulative on each table or near each cluster of desks.)
- 8 Give students as much of the rest of the session as they need to work on the assessment independently.

Circulate around the room as students are working to provide help as needed. As you watch the students at work, look for evidence of the thinking, tools, and solution strategies they are using to solve the problems.

9 As students complete and turn in their assessments, have them go back to shopping for and solving classmates' story problems for the remainder of the session.

Leave the students' story problems up, along with the problem strips and half-sheets of paper, and let students return to shopping during Work Places over the next couple of weeks. Eventually, each student should have a chance to look at the solutions written by his or her classmates.

Home Connection

- 10 Introduce and assign the Shopping & Subtracting Home Connection, which provides more practice with the following skills:
 - Solve two-step addition story problems with sums to 100 involving situations of adding to and putting together, with unknowns in all positions (2.OA.1)
 - Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to subtract fluently with minuends to 100 (2.NBT.5)
 - Add three 2-digit numbers (2.NBT.6)
 - Solve money story problems involving quarters and nickels (2.MD.8)

Encouraging Self-Assessment

Many second graders enjoy comparing the results of their unit preand post-assessments, looking to see which items they were able to do correctly the second time around, and noting changes in their handwriting, organizational skills, the strategies they used to solve various problems, and so on. This is a relatively quick way to help students take ownership, and something you might consider implementing after students take the Unit 3 Post-Assessment, if you haven't already done so in an earlier unit.



Teacher Masters

GRADE 2 – UNIT 3 – MODULE 3







Work Place Guide 3D Base Ten Triple Spin

Summary

Players begin by spinning to determine if they will win with a large or small number. Players then take turns spinning for a digit 2–7 and deciding if they want that spin to represent ones, tens, or hundreds. As they decide, they take the appropriate base ten area pieces and continue spinning until each player has built a 3-digit number. The players then sketch their base ten area pieces on a shared record sheet, write their numbers in expanded form, and compare the numbers to determine the winner.

Skills & Concepts

- Understand that the three digits of a 3-digit number represent amounts of hundreds, tens, and ones (2.NBT.1)
- Skip-count by 10s and 100s within 1000 (2.NBT.2)
- Read and write numbers to 1000 represented with numerals and in expanded form (2.NBT.3)
- Compare pairs of 3-digit numbers, based on an understanding of what the digits in their hundreds, tens, and ones places represent (2.NBT.4)
- Use >, =, and < symbols to record comparisons of two 3-digit numbers (2.NBT.4)
- Reason abstractly and quantitatively (2.MP.2)

Materials

Copies	Kit Materials	Classroom Materials
TM T3 Work Place Guide 3D Base Ten Triple Spin TM T4–T5 Work Place Instructions 3D Base Ten Triple Spin TM T6 3D Base Ten Triple Spin Record Sheet	 large base ten area pieces (3 sets) additional red base ten hundreds pieces (30, placed in the bottom of the Work Place bin, under the other materials) 3 Base Ten Triple Spin Spinners 	

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that	Differentiate					
Students are struggling to decide which denomination to take each spin in.	UPPORT Most students figure out how the game works after they play it several times. If some of your students can't make sense of it after a reasonable amount of time, have them take their three spins before hey spin the Greater than/Less than spinner. Invite them to take the first spin in 100s, the second in 10s, and the third in 1s. After they have each recorded the results of their spins, ask them to spin the Greater than/Less than spinner.					
Students are playing the game with confidence and ease, and might benefit from a challenge.	CHALLENGE Invite such students to take six spins each, build two 3-digit numbers, and add the numbers to determine the winner. These students will need to figure out how to modify the existing record sheet or make one of their own.					
English-Language Learners Use th	ne following adaptations to support the ELL students in your classroom.					
Review the idea of using sketches to ones pieces—on a piece of paper an represent the mat (100), a vertical lin	record the results of each spin by laying large base ten area pieces—one each of the hundreds, tens, and d drawing the shorthand for each piece right next to it along with the number it represents. Use a square to e to represent the strip (10), and a dot to represent the unit (1).					
	1 • 224					
	10 317					
	100 403 6					

Work Place Instructions 3D Base Ten Triple Spin

- 1 Each player needs a pencil. Players share a record sheet, spinner, a set of large base ten area pieces, and 10 extra base ten hundreds pieces (red mats). Before they start, players need to decide who will be red and who will be blue.
- 2 One player spins the Greater than/Less than spinner to determine if they will play for more or less. The other player circles *more* or *less* on the record sheet to show the results of the spin.
- 3 The first player spins the number spinner and decides whether to take that digit in base ten area ones (units), tens (strips), or hundreds (mats) pieces.
- 4 The second player takes a turn spinning, deciding, and taking that many base ten area pieces.
- 5 The first player spins again and takes the digit in another denomination. If he took the first spin in ones (units), he has to take the second spin in either tens (strips) or hundreds (mats). Players can't take two of their spins in hundreds and none in ones.
- 6 The second player takes a second turn.
- 7 Both players take turns to make a third spin and take the result in whatever denomination remains to them. At the end of their third spin, each player should have some hundreds, some tens, and some ones pieces.



"I got 436. I wish I'd waited 'til my last roll to take the 100s, but I was afraid that 4 would be the biggest number I'd roll so I took it in 100s just to be safe."

8 Players then each sketch their base ten area pieces in the 100s, 10s, and 1s boxes and write an addition equation on the shared record sheet.

den.		pare	
🛍 3D Bas	e Ten Triple Spin Record She	et	
Round 1:	We are playing for:	More	Less
Red Player	1005		15 • •
	+	3 = 263	15
Blue Player			•
	400+_50_+_	2_=_452	2
		The winner i	s (circle one)

(continued on next page)



Work Place Instructions 3D Base Ten Triple Spin

9 Players write their numbers at the bottom of the Round 1 box, use the greater than or less than sign to compare their scores, and show who won. (The winner is determined by the original spin. If the players spun *less* at the beginning of the round, the player with the lower score wins. If the players spun *more* at the beginning of the round, the player with the higher score wins.)



10 Players complete a second round on the same record sheet. Then players take a second record sheet and play two more rounds so that both players have a sheet to put in their folder.

| DATE

NAME

Base Ten Triple Spin Record Sheet

Round 1:		We are playing for:	More	Less
Red Player	100s		10s	1s
		++	=	_
Blue Player	100s		10s	1s
		++	=	_
			The winner i	s (circle one)
Red Player's Score		Blue Player's Score	Red	Blue

Round 2:		We are playing for:	More	Less
Red Player	100s		10s	1s
		++	=	_
	100s		10s	1s
Blue Player				
		++	=	_
			The winner i	s (circle one)
Red Player's Score		Blue Player's Score	Red	Blue





(continued on next page)



Presents & Parcels Talk Bubbles page 2 of 2



Presents & Parcels









Summary

Players take turns drawing 5 cards from a deck and then each choosing three of the cards to add together to get as close as possible to 20. Players then find the difference between their score and 20. The winner is the player with the lowest score after five rounds.

Skills & Concepts

• Fluently add and subtract within 20 using mental strategies (2.OA.2)

Materials

Copies	Kit Materials	Classroom Materials
TM T12 Work Place Guide 3E Target Twenty TM T13–T14 Work Place Instructions 3E Target Twenty TM T15 3E Target Twenty Record Sheet	3 decks of Number Cards with the wild cards removed	 scratch paper, class set student number racks (optional)

Assessment & Differentiation

Here are some quick observational assessments you can make as students begin to play this game on their own. Use the results to differentiate as needed.

If you see that	Differentiate	Example
Students are struggling to find cards that total closest to 20.	 SUPPORT Encourage students to use any classroom tools (except calculators) to help them determine the arrangements that will result in sums that are closest to 20, including: Unifix cubes a number rack sketches on an open number line 	
Students are playing the game with confidence and ease, and might benefit from a challenge.	CHALLENGE Pair students working at roughly the same level, and invite them to try game variation A.	



Work Place Instructions 3E Target Twenty

- 1 Players need a deck of cards, 2 Target Twenty Record Sheets, and pencils.
- 2 Players work together to shuffle the deck of cards, then put them in a pile face-down between them.
- 3 Players take turns drawing cards from the deck until both of them have 5 cards.
- Players each choose three of their cards to add together. The target sum is 20, so they should choose the 3 numbers that will make a sum as close to 20 as possible, either under or over. (For example, if a player had the cards 3, 3, 4, 9, and 9, he could make 4 + 9 + 9 = 22 or 3 + 9 + 9 = 21. He would choose 3 + 9 + 9 because 21 is closer to the target, 20, than 22.)
- 5 Players each write an addition equation with their numbers and their sum on the record sheet. They may use their number racks to help find the sums if they like.
- 6 Players double-check each other's work.
- 7 Players figure out their scores by finding the difference between their sum and 20. (For example, a sum of 16 has a score of 4; a sum of 27 has a score of 7; a sum of 20 has a score of 0.)
- 8 Players each record their score and their partner's score on their record sheet.





(continued on next page)

Work Place Instructions 3E Target Twenty

- 9 Players put the used cards face-up in a discard stack and then take turns drawing 3 new cards from the deck so they each have 5 again.
- 10 Players continue taking turns until they have each played five rounds of the game.
- 11 Each player adds his or her scores to determine the winner. The lowest score wins the game.

Game Variations

A Players use the wild cards to play the game. A wild card can be any numeral (1 to 9) they want it to be. If players use a wild card, they put a star above the numeral made from the wild card in the equation on their record sheet.



DATE

👑 3E Target Twenty Record Sheet

For each round of the game:

- Choose three of your five cards that you can add together to get as close as possible to 20.
- Write an addition equation with those numbers and their sum.
- Then record your score. Your score is the difference between your sum and 20.
- When you complete a game, find your total score and your partner's.
- The lowest score wins the game.

	First Game	Sum	Score	Partner's Score
1	+=			
2	+=			
3	+=			
4	+=			
5	+=			
	My Final Score	My Par	tner's Final Score	

	Second Game	Sum	Score	Partner's Score				
1	+=							
2	+=							
3	+=							
4	+=							
5	+=							
	+ = My Final Score							



NAME

Unit 3 Post-Assessment page 1 of 4

Answer the following questions. Show your work.

1 Bob raced his toy car three times in a row. The car went 10 feet, 14 feet, and 14 feet.

DATE

- Mark each distance the car raced on this number line.
- Label the number it ended on.

0

Bob raced the toy car _____ feet in all.

2 Bambam the kangaroo did the triple jump, jumping three times in a row. She jumped 35 feet, 35 feet, and 38 feet.

____ Mark Bambam's jumps on this number line.

_ Label the number she ended on.



Bambam jumped _____ feet in all.

(continued on next page)

NAME

Unit 3 Post-Assessment page 2 of 4

- **3** Start at 0 and make jumps of 5, 10, and 20 to get up to 115. You have to use at least one jump of each length.
 - ____ Draw your jumps on the number line.
 - ____ Write the length of each jump.
 - ____ Label 115.



4 Julia counted sticks. Every time she got to 10, she made a bundle with a rubber band. How many sticks does Julia have in all?



Julia has ______ sticks in all.

5 Ana has some sticks on the table. She has 44 more sticks under the cloth. How many sticks does Ana have in all?

____ Write an equation for this problem here. _____

- _____ Solve the equation.
- ____ Show your work.



Ana has ______ sticks in all.



| DATE

Unit 3 Post-Assessment page 3 of 4

NAME

6 Sam is 15 years old. His Aunt Nancy is 100 years old. How much older is Aunt Nancy?_____ Use the number line to solve the problem.



Aunt Nancy is _____ years older than Sam.

7 Adam is 45 years old. His grandfather Robert is 98 years old. How much older is Grandpa Robert?

_____ Use the number line to solve the problem.



Robert is _____ years older than Adam.

8 Sara has three lucky numbers: 17, 43, and 91. Find each of these numbers on the number line and label it to show where each of Sara's three lucky numbers are.



(continued on next page)



NAME

Unit 3 Post-Assessment page 4 of 4

9 Each big box contains 10 gifts. There are single gifts tied with ribbon as well. How many gifts in all are in the picture below? Write the answer on the line below.



There are _____ gifts in all in this picture.

10 The boys are playing tricks. Zach hid 58 sticks under one towel. Bart hid 93 sticks under another towel. Who hid more sticks, Zach or Bart? How many more? Show your work.







Home Connections

GRADE 2 – UNIT 3 – MODULE 3



NAME

Tens & Ones, Nuts & Carrots page 1 of 2

 Tell how many tens and ones there are in each set of base ten pieces. Then write an equation to show the total.



2 Tell how many dimes and pennies there are in each box. Then write an equation to show the total.



(continued on next page)

Unit 3 Module 3	Session 1		
NAME		DATE	

Tens & Ones, Nuts & Carrots page 2 of 2

3 The squirrels are hiding nuts for the winter. Three of the squirrels each got 4 nuts. Five of the squirrels each got 5 nuts. How many nuts do they have in all? Show your work.

The squirrels got _____ nuts in all.

4 CHALLENGE The zookeeper brought 9 bunches of carrots for the elephants. Each bunch had 5 carrots. He gave one of the elephants 24 carrots. How many carrots were left for the other elephants? Show your work.



There were _____ carrots left for the other elephants.



Shopping & Adding page 1 of 2

1 Erika went to the store. She got a pencil for 15¢ and a tablet for 25¢. She gave the storekeeper 50¢. How much money did she get back? Show your work.

| DATE

Erika got _____ back.

2 CHALLENGE Use the numbers in the box to solve the problems below.

	15	24	6	8	3	17	4	20	32	10
а	Find	2 numl	oers who	se sum i	s 40					
b	Find	2 numl	oers who	se sum i	s 18					
C	Find	2 other	[.] number	s whose	sum is 1	18				
d	Find	2 numl	oers who	se differ	ence is 1	2				
е	Find	3 numl	pers that	have the	e largest	total				
f	Wha	t is the	total of t	hose 3 n	umbers	? Show yo	our work	ζ.		

NAME

Shopping & Adding page 2 of 2

3 Add. Use the pictures of base ten pieces to help. The second set of pieces for each problem is hidden, so you will have to draw them or imagine them.



Solving Presents & Parcels Story Problems page 1 of 2

Note to Families

Your student has spent the last several days at school working to create and solve story problems about presents and groups of 10 presents called parcels. As students work on this Home Connection, ask them to show you how working in groups of 10 rather than counting by 1s can make their work faster. You may even choose to work alongside your student and share some of your strategies to arrive at the same answer.

| DATE

Solving Presents & Parcels Story Problems

Read the presents and parcels story problems on this sheet and the next, and choose at least four you want to solve. Then go to work. Remember—the answer is not enough. You need to show how you solved each problem, using pictures, numbers, and/or words. Be sure to work in 10s instead of 1s whenever you can.

ex Emile is having a birthday party. There are 35 presents for Emile at the party. Some of the presents are in the closet, and 19 of the presents are on the table. How many presents are in the closet?



1 It was June 29, Vincent's birthday. There were 12 presents on the fireplace and 23 on the table. How many presents in all?

2 It was Jake and Sam's birthday. There were 26 presents. Jake and Sam wanted to split them evenly, but they didn't know how. Can you help them?

(continued on next page)

Solving Presents & Parcels Story Problems page 2 of 2

3 It was April 24, my sister's birthday. Six kids came to her party. She had it at Zippy's Pizza. Each kid brought 10 presents. My mom gave her 2 presents. How many presents did she get in all?

4 Today is Briana's 18th birthday. She knows there are 18 presents in the closet and also 23 presents under the table. Now Briana wants to know how many in all.

5 Dan was having a Valentine's party. There were 24 presents in the closet and 23 on the table. Then someone opened 12 of the presents. How many were not yet opened?

6 It was Jessie's big party. Jessie said to come at 5:00 PM. One of his friends peeked through the window. He saw only 13 presents. Jessie said there were supposed to be 42 presents. How many presents were in the closet?

7 CHALLENGE It was Taylor's 8th birthday and there were 47 presents. Each kid brought 10 presents, except for 3 kids who brought 5 presents each and 2 kids who brought 1 present each. How many kids came to Taylor's party?

Shopping & Subtracting page 1 of 2

1 Alex went to the store. She bought an orange for 25¢, an apple for 24¢, and a banana for 23¢. How much money did she spend in all? Show your work.

Alex spent _____ in all.

2 CHALLENGE Jake has 3 quarters and 4 nickels. An apple costs 20¢. How many apples can Jake buy? Show your work.

83



Jake can buy _____ apples.





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NAME

Shopping & Subtracting page 2 of 2

3 Subtract. Use the pictures of base ten pieces to help.




Digital Resources

GRADE 2 – UNIT 3 – MODULE 3



Unit 3 Module 3 Digital Resources

These resources, selected from the curated collection at the Bridges Educator site, can be used to extend instruction and support students during this module.

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Apps by The Math Learning Center

Number Pieces

This app allows students to manipulate base ten pieces and write on the screen. One advantage to these virtual base ten pieces is that students can group units to make strips, and strips to make mats—something not possible with physical base ten pieces. You might make the Number Pieces Basic app available to students to use in modeling and solving the story problems posed throughout the unit, especially in activities that involve physical sticks and bundles or base ten pieces.

catalog.mathlearningcenter.org/apps/number-pieces

Number Line

This app helps students visualize number sequences and model strategies for addition, subtraction, multiplication, and division. It can be used to represent sequences of numbers, including whole numbers and multiples of a variety of numbers. Students can use what they know about number relationships and computation to identify missing elements of sequences shown on the number line.

catalog.mathlearningcenter.org/apps/number-line

Additional Resources

Base Ten

Consider having students who need more practice using base ten pieces to build 2- and 3-digit numbers use the online Base Ten activity instead of or in addition to Base Ten Triple Spin during Work Place time in this module.

This web-based activity shows different 2- or 3-digit numbers out of sequence and invites students to build each using units, strips, and mats. As they add pieces to their collection, a number line at the bottom of the screen shows the total, supporting students learning to read and understand numbers to 100 or 1,000. The activity also encourages students to move from one quantity to the next, adding to or subtracting from their collection of pieces, rather than clearing the screen each time.

www.learningbox.com/Base10/BaseTen.html

Fridge Magnet Addition & Subtraction Games

Students add 2-digit numbers or subtract 1-digit numbers from 2-digit numbers with unknowns in various positions by dragging magnets on a fridge. Timed and untimed versions of the game offer varying levels of challenge.

Listed at www.bbc.co.uk/skillswise/maths/games

Higher & Lower

This independent activity allows students to reveal 5 cards and place them in order in a mannner similar to that of Solitaire. Players can choose values to 10, 20, 100, or 1,000; input a customized set of numbers; or choose cards that show collections of objects instead of numerals.

www.wmnet.org.uk/resources/gordon/Higher And Lower - Reveal and Order v6.swf



25

+16

41

10

30 + 10 -1 = 41

Virtual Manipulatives

Additional apps, including the Number Rack and Geoboards, are available free from the Math Learning Center for web, iOS and other platforms.

Math Vocabulary Cards

The Math Vocabulary Cards app (available for web and iOS) helps students deepen their conceptual understanding of key terms in mathematics. Each card features a math term, a representative example or model, and a concise definition.

Bridges Educator Site Resources

The following resources are available to Bridges classrooms at the Bridges Educator site.

Interactive Whiteboard Files

Interactive whiteboard files in SMART Notebook and IWB formats for the teacher masters in each module.

Family Overviews

Brief overviews of each Bridges unit, designed to be sent home to families. Available in English and Spanish.

Support & Intervention

Targeted instruction and support, addressing Tier 2 within the Response to Intervention framework. Each volume contains activities, games, and practice pages that can be used for reteaching, practice, and progress monitoring.



Teachers Guide

GRADE 2 – UNIT 3 – MODULE 4



Module 4 Data & the Many Colors Project

Session 1	The Many Colors Project, Part 1
Session 2	The Many Colors Project, Part 27
Session 3	The Many Colors Project, Part 3

Teacher Masters

Pages renumber with each module.	
Graphing FormT1	

Student Book Pages

Page numbers correspond to those in the consumable books.	
Many Colors Record Sheet	40
Telling More About Our Graphs	41

Home Connections Pages

Page numbers correspond to those in the consumable books.

Digital Resources	D1
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Module 4 Data & the Many Colors Project

Overview

In this module students investigate the frequency with which various colors show up in bags of objects. While the sessions are written with small bags of candy-coated chocolates in mind, teacher-prepared bags of colored buttons, pattern blocks, or Unifix cubes can be used. Counting the numbers of each color in individual bags, graphing, comparing, and then examining class data enable students to make predictions about the colors likely to turn up most frequently in all bags. As students graph class data, they discover that the graphing form doesn't have enough rows to accommodate all the quantities without assigning each box a value of more than one, so chunking becomes a valuable skill needed to complete the task.

Planner

Session & Work Places			Α	НС
Session 1 The Many Colors Project, Part 1 This session is the first of three in the The Many Colors Project, an activity designed to help students develop number sense in the context of a statistical investigation. In today's session students predict the number of each color they will find in a bag of objects such as buttons or candy. Then they find the frequencies with which certain colors appear, and work with a partner to count and share the items in the bag.	•	•		
Session 2 The Many Colors Project, Part 2 Students create graphs to show how many of each color they found in their bags of items. The class works together to create a scale that is appropriate for the data and to label the graph so that it is clear to others what is being presented. The session ends with a brief discussion of problems that could be solved using the graphs.	•	•		•
Session 3 The Many Colors Project, Part 3 In this final session of the Many Colors Project, students analyze their own data, write equations based on another student's data, and also create and analyze a class graph using the data from everyone's results.	•	•		

P&I - Problems & Investigations, WP - Work Place, A - Assessment, HC - Home Connection

Materials Preparation

Each session includes a complete list of the materials you'll need to conduct the session, as well as notes about any preparation you'll need to do in advance. If you would like to prepare materials ahead of time for the entire module, you can use this to-do list.

Task		Done
Copies	Run copies of Teacher Master T1 according to the instructions at the top of the master.	
	Run a single display copy of Student Book pages 39–41.	
	If students do not have their own Student Books, run a class set of Student Book pages 39–41.	
	If students do not have their own Home Connections books, run a class set of Home Connections pages 85–87.	
Special Items	Prepare a half-class set of bags containing 45–60 small items such as pattern blocks, Unifix cubes, or buttons, in the following colors: red, green, blue, yellow, brown, and orange. One-and-a-half-ounce bags of M&M's also work very well for this project, if you choose to purchase enough of these small bags for each pair of students to share.	



Additional Resources

Please see the Resources section at the end of this module for a collection of resources you can use with students to supplement your instruction.

Session 1 The Many Colors Project, Part 1

Summary

This session is the first of three in the The Many Colors Project, an activity designed to help students develop number sense in the context of a statistical investigation. In today's session, students predict the number of each color they will find in a bag of objects such as buttons or candy. Then they find the frequencies with which certain colors appear, and work with a partner to count and share the items in the bag. The sessions that follow involve graphing and analyzing the data collected today and prepare students for work with data in later units. If time allows, the session ends with a visit to Work Places.

Skills & Concepts

- Determine whether a group of objects has an odd or even number of members (2.OA.3)
- Model and describe division situations in which sets are separated into equal parts (supports 2.OA)
- Add three 2-digit numbers using strategies based on place value and properties of operations (2.NBT.6)
- Explain why strategies for adding 2-digit numbers work, using place value and the properties of operations (2.NBT.9)
- Make sense of problems and persevere in solving them (2.MP.1)
- Attend to precision (2.MP.6)

Materials

Copies	Kit Materials	Classroom Materials		
Problems & Investigations The Many Colors Project, Part 1				
SB 40* Many Colors Record Sheet		 small, opaque bags such as paper lunch bags, each filled with 45–60 small items in 6 different colors (half-class set, see Preparation) Unifix cubes pattern blocks (optional) buttons (optional) <i>More M&M's Math</i> by Barbara McGrath (optional) 		
2E Steps & Leaps (i 3A Star Power (intr 3B Five in a Row (ii 3C Hit the Zone (ir 3D Base Ten Triple 3E Target Twenty (ntroduced in Unit 2, roduced in Unit 3, Mo ntroduced in Unit 3, I itroduced in Unit 3, N Spin (introduced in U introduced in Unit 3,	Module 3, Session 3) odule 1, Session 3) Module 1, Session 5) Aodule 2, Session 4) Unit 3, Module 3, Session 1) Module 3, Session 5)		

HC – Home Connection, SB – Student Book, TM – Teacher Master

Copy instructions are located at the top of each teacher master. *Run 1 copy of this page for display.

Preparation

You will need to prepare or purchase a half-class set of bagged items before this session begins. Ideally students will not be able to see the contents of the bags before they open them. Each bag should contain 45–60 small items such as pattern blocks, Unifix cubes, or buttons, in the following colors: red, green, blue, yellow, brown, and orange. One-and-a-half-ounce bags of chocolate coated candies also work very well for this project, if you choose to purchase enough of these small bags for each pair of students to share.

If you make your own bags of items, use the same type for every bag (e.g., Unifix cubes, pattern blocks, or buttons) and make sure the total number varies slightly, and that the number of each color varies considerably from one bag to the next, much as it would in a factory situation where a machine packages items on the basis of their weight rather than their color.



Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

data* even odd prediction

Problems & Investigations

The Many Colors Project, Part 1

- 1 Gather students in the discussion circle and set the stage for today's session.
 - Show students one of the bags of items you have prepared or purchased and tell them what's in the bag (Unifix cubes, pattern blocks, buttons, or M&M's).
 - Explain that there are a variety of colors in the bag.
 - Then engage students in making some predictions about the total number of items in the bag, the colors they might see, and how many there might be of each color.
 - Ask students to consider and discuss some of the following questions:
 - » How many items do you think are in this bag?
 - » What colors might be in the bag?
 - » Do you think there will be the same number of each color in the bag?
 - » If not, which color might appear most frequently in the bag? Why?
- 2 Then explain that you have a similar bag for every pair of students in class, and each bag is filled with the same items as the first. Ask students to make some predictions about the whole set of bags.

Teacher Many of you think that the bag I first held up would have more green than any other color. Some of you explained that you thought it would be green because we seem to have a lot of greens in our set of pattern blocks. Others said it might be green because the green triangles are the smallest blocks in the set so there are more of them. So let me ask you a couple of questions about all the bags we'll work with today:

- » Do you think all the bags have the most of one particular color? Why or why not?
- » Do you think all bags have the same number of colors? Why or why not?
- » Do you think each bag has the same number of each color? For instance, if there are 5 red, 3 blue, and 10 green pattern blocks in this bag, do you think all the other bags will have 5 reds, 3 blues, and 10 greens? Why or why not?
- 3 Explain that during this session the students will get a chance to make predictions about what's in the bag and then check to see if they were right by opening the bags and counting what's inside.

You can give students a specific breakdown of the next few days by explaining that today they will gather information about the items in the bags, tomorrow they will make graphs to show the data, and then on the last day they will answer questions about their data.

4 Next, display your copy of the Many Colors Record Sheet, and have students find the sheet in their Student Books. Read and review the instructions with the class.

Be sure students understand that they are not to open their bags until they get to item 5 on the record sheet. The first four items on the sheet all involve making estimates and predictions.

5 As you review item 5 on the sheet, talk with students about some of the strategies they might use to find the total number of items in the bag, once they've counted how many there are of each color.

Record a set of hypothetical numbers for each color on the board. Then ask students to share, first in pairs, and then as a whole group, ideas for finding the total.

Literature Connections

If you choose to use candy for this project, consider opening Session 1 with *More M&M's Math* by Barbara McGrath. This optional read-aloud provides an engaging preview of some of the activities in Sessions 1–3.



Teacher Let's pretend we open a bag and find 5 reds, 11 greens, 3 blues, 14 yellows, 19 browns, and 6 oranges. Now, I could go back and count all the items by 1s to get the total, but that would take a long time and probably not be very accurate. Please talk to the person next to you about how you would work with these numbers to find the total. (Gives students a minute to pair-share.) Who'd like to share their strategy for finding the total?

Anabelle It's 58!

Teacher How did you find the total?

Byron We added the greens and the browns first. That made 30 because 11 and 19 kind of fit together. Then we put the yellows and the oranges together, and that's 20, so now we're up to 50. Then 5 and 3 more, and it's 58.

Teacher OK. It sounds like you looked for friendly combinations you could add in your head. Did someone have a different strategy for finding the total?

Chase We put all the tens together, so that was 10, 20, 30, and then the 1 from the green and the 9 from the brown made another 10, so that was 40. Then we kind of got stuck.

Teacher If you have a look at the Many Colors Record Sheet in your book, you'll see that there's a place toward the bottom where you need to show how you found the total. Will it be easier to find the total with paper and pencil, as you'll need to do on the record sheet?

Devon Yes! I think you should line all the numbers up under each other, and then it would be easier to add them.

Teacher Could you use an open number line to add all these numbers in the space where you're supposed to show your work?

Students Yes.

Teacher Which number would you start with on the line? Talk to the person next to you about that.

Elisa I'd start with 19 because it's the biggest.

Shawn That's a good idea, and I have another one. You could start with 14 and 6 because then you're at 20 and it's easy to add numbers onto 20.

- 6 As you review item 7 on the Many Colors Record Sheet, have students pairshare strategies for sharing the items in the bag equally with a partner.
 - Review the terms *odd* and *even* in the context of sharing the items in the bag equally with a partner.
 - To help students generate ideas for sharing the items in their bag more efficiently than by 1s, work with input from the class to divide a set of 46 Unifix cubes evenly.

Teacher Suppose you and your partner get 47 items. How will you share them equally?

Thanh We won't be able to. There will be 1 left over because 47 is an odd number.

Bo We can split that last 1 in half or give it to you. **Chase** I'll let my partner have it.

Teacher What about 46? Would there be one left over if you shared 46 items?

Latisha No, because 4 is even and so is 6, so 46 must be even.

Teacher How might you share 46 so you both got the same number? *Emmond* We could go 1 for me and 1 for you—just like we do when we play cards.

Teacher That's a method that will work for sure, but it might take a while. Would it be possible to work it any other way? What if, for instance, we got out 46 Unifix cubes and grouped them into 10s and 1s? How would you split these up?



Sara We could go by 2s instead of 1s, like 2 for me, 2 for you, and keep on going until the cubes were all gone.

Gina We could go by 5s. We could each take half of every 10. Like, I could have 5 and Sara could have 5 for every 10. Then we could split the last 6 in half—3 each.

Chase Hey, wait! You could each take 2 tens and 3 of the ones—it would be 23 each!

7 Then remind students to fill in the space at the bottom of the page to indicate how many items each partner gets.

If you are using candy, tell students they can eat the candies or save them for later after they have divided them evenly and completed the last item on the sheet.

8 Finally, provide each pair with a bag of items, and give them the rest of the session to complete the record sheet together.

Since each student will have his or her own sheet, they don't have to agree on the estimates and predictions they make for items 1–4, but they do have to discuss their ideas with one another.

Work Places

- 9 As students complete their record sheets, invite them to spend any time remaining in the session at Work Places.
- 10 Close the session.
 - Have students clean up and put away the Work Place bins.
 - Take a quick survey by show of hands to see how many items students found in their bags: between 40 and 45, between 46 and 50, between 51 and 55, more than 55.
 - Let students know that next session, they'll each create a graph to show how many items of each color they found in their bag.

Session 2 The Many Colors Project, Part 2

Summary

Today students create graphs to show how many of each color they found in their bags of items during the previous session. The class works together to create a scale that is appropriate for the data and to label the graph so that it is clear to others what is being presented. After students have each graphed their own data from the previous session, they share and compare their graphs in small groups, and then as a whole class. Finally, the teacher introduces and assigns the Sorting & Graphing a Collection Home Connection.

Skills & Concepts

- Make a bar graph to represent a data set with up to 4 categories (2.MD.10)
- Solve simple put-together (addition), take-apart (subtraction), and comparison problems using data shown on a bar graph with up to 4 categories (2.MD.10)
- Model with mathematics (2.MP.4)
- Look for and make use of structure (2.MP.7)

Materials

Copies	Kit Materials	Classroom Materials			
Problems & Investigations The Many Colors Project, Part 2					
TM T1 Graphing Form SB 40• pens in black, blue, red, and green • crayons (class set)Many Colors Record Sheet					
Work Places in Use	·	·			
 2E Steps & Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 3D Base Ten Triple Spin (introduced in Unit 3, Module 3, Session 1) 3E Target Twenty (introduced in Unit 3, Module 3, Session 5) 					
Home Connection					
HC 85–87 Sorting & Graphing a Collection					

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

bar graph* data*

Problems & Investigations

The Many Colors Project, Part 2

- 1 Gather students in the discussion circle and give them a few minutes to share and discuss their results from the previous session.
 - Did all the bags have the same number of items?
 - What was the greatest number of objects in a bag? What was the fewest?
 - Did all the bags have the same number of items in each color?
 - Did one or more color seem to show up more frequently than others?

Teacher It sounds like many of you got more brown M&M's than
anything else. Was that true for everyone?Julian Not me! I got more yellows than anything else.Nikki Me too.Noah There were lots of yellows and browns at our table.Hannah We got more green than anything.Esteban We hardly got any blue or red. I wonder why they don't
make more of those.Ryan Maybe they make lots of brown because chocolate is brown.

2 Explain that today, students are going to graph the data they collected. Then discuss graphs and why people make them.

The idea that a graph is a "picture of the numbers"—a way to present data that facilitates comparison and analysis—is very central to the field of statistics. It may or may not emerge from your class, depending in part upon students' previous experiences with graphs. If students don't mention it, you'll want to tell them now and have them reconsider the idea once their graphs are made.

Teacher When people conduct studies or investigations like this, they often graph their data. Do you know what that means? Hannah Is that when they put the numbers on a graph? Like when we color in graphs to show how many we got? Teacher Yes. Do you know why people do that? Brent Maybe because it's fun to color? Chase It kind of makes a picture of the numbers. Latisha Yeah—like if you have 10 and 3 and you color them in on a

Have students each locate their completed copy of the Many Colors Record

graph, it's easier to see that one is way bigger than the other.

- 3 Have students each locate their completed copy of the Many Colors Record Sheet in their Student Book while you display a copy of the Graphing Form Teacher Master where everyone can see it.
 - Invite students to make observations about the Graphing Form.

The Graphing Form is purposely generic. Students will use the sheet for other projects this year. By keeping the spaces for category labels, scale, and title blank, the form presses students to think critically about these parts of the graph.

- 4 Work with students' input to record a title and column labels and the scale on your copy of the Graphing Form.
 - Model the process for choosing the scale for the graph on display.

- » First, ask students to count the number of boxes in a single column and compare that number to the number of items they counted in each color.
- » Because the graph only has 12 boxes in each column and more than likely someone in the class found more than 12 items in a single color, a scale of one item per box will not work.
- » Ask students for suggestions about how to solve this problem. If no one comes up with the idea of using one box to stand for more than one item, make the suggestion yourself.
- » Then explain that if one box stands for more than one item, all the boxes have to stand for that number of items.
- 5 Ask one of the students to let you borrow his Student Book for a few minutes. Use the data from his Many Colors Record Sheet to fill in several columns on the graph. Then discuss the data displayed to make sure students understand how to read the scale accurately.



Tools for Modeling Mathematics

Consider allowing your students to use an online graphing tool as an alternative to the penciland-paper graphing form provided in the session. The Graph Maker is simple enough that second graders can use it effectively to display the color data collected during the previous session.

This and other resources are listed in the Resources section at the end of the module.

Teacher Thank you for letting me borrow your book and use the data you and your partner collected last session. Let's see. So far, the graph tells us that these two had how many reds?

Latisha I say 4! No, wait, that's not right.

Bo I think it's 8 because each box means 2, not 1.

Astrid Also, if you look at the number on the side, it says 8.

Teacher And how many greens and blues did they have?

Callie They had 10 greens and 3 blues.

Maria Boy, they had lots more greens than blues.

Theo Yeah—7 more.

Pedro Wait 'til you see how many browns we had!

Teacher That's the nice thing about a graph, isn't it? Graphs make things so easy to see.

6 After filling in a few columns, ask for suggestions about labeling the line running vertically beside the numbered boxes.

Ask students to identify what the boxes stand for. Are they inches? Pounds? Numbers of apples? Come to an agreement on the best label and write it in on the display.

7 Then give each student a copy of the Graphing Form Teacher Master and have them work with their partners from the previous session to complete the form.

Encourage students to work as neatly and carefully as possible so their graphs will be easy to read. You might have them use crayons or colored pencils in colors that correspond to the item colors. This makes the finished graphs a little more attractive and easier to read.

ELL Display a completed graph along with its corresponding Many Colors Record Sheet for students' reference.

8 When most of the students have completed the assignment, have each pair share and compare their graphs with another pair. Then borrow a couple of graphs from students to display and discuss as a whole group.

In the next session, students will be asked to solve problems based on the graphs created by others. The discussion today is intended to prepare them for that work. Get students ready by asking such questions as:

- Which color turned out to occur most/least often for you? Was it the same for the other graphs you saw?
- There is a big difference between the number of greens and reds on this graph. What is that difference? Does your graph show such a difference?
- The shape of this graph is a bit like a roller coaster, with the highest point in the brown column. Does your graph have the same shape?
- Did anyone have more than one color with the same number of items? If you combined those items, how many would you have in all?
- 9 Conclude this part of the session by collecting students' Graphing Form sheets, or having students place them in their Student Books, for use next session.

Work Places

- 10 Invite students to spend the rest of the session at Work Places.
- 11 Close the session.
 - Have students clean up and put away the Work Place bins.

Home Connection

- 12 Introduce and assign the Sorting & Graphing a Collection Home Connection, which provides more practice with the following skills:
 - Classify objects into categories (K.MD.3)
 - Count the number of objects in different categories (K.MD.3)
 - Make a bar graph to represent a data set with up to 4 categories (2.MD.10)
 - Model with mathematics (2.MP.4)

Session 3 The Many Colors Project, Part 3

Summary

In this final session of the Many Colors Project, students make a class graph to find out which of the six colors showed up with the most frequency. Then they analyze their own data, and write and solve problems based on another student's data.

Skills & Concepts

- Solve simple put-together (addition), take-apart (subtraction), and comparison problems using data shown on a bar graph with up to 4 categories (2.MD.10)
- Reason abstractly and quantitatively (2.MP.2)
- Model with mathematics (2.MP.4)

Materials

Copies	Kit Materials	Classroom Materials			
Problems & Investigations The Many Colors Project, Part 3					
SB 39 Many Colors Record Sheet SB 41–42* Telling More About Our Graphs	 base ten area pieces craft sticks (a few bundled as 10s plus several singles) 	Graphing Forms, completed (TM T1 from Session 2)			
Work Places in Use					
 2E Steps &Leaps (introduced in Unit 2, Module 3, Session 3) 3A Star Power (introduced in Unit 3, Module 1, Session 3) 3B Five in a Row (introduced in Unit 3, Module 1, Session 5) 3C Hit the Zone (introduced in Unit 3, Module 2, Session 4) 3D Base Ten Triple Spin (introduced in Unit 3, Module 3, Session 1) 3E Target Twenty (introduced in Unit 3, Module 3, Session 5) 					

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

bar graph* compare*

HC – Home Connection, **SB** – Student Book, **TM** – Teacher Master Copy instructions are located at the top of each teacher master. * Run 1 copy of this page for display.

Preparation

Before today's session begins, prepare the board or other display area with labels for the data display students will create early in today's session.



Problems & Investigations

The Many Colors Project, Part 3

- 1 Gather students in the discussion circle and explain what they will do during today's session.
 - First, they will work together to make a class graph in order to find out which colors occurred with the greatest frequency in their bags.
 - After that, you'll return the graphs they made during the previous session, and they'll take a closer look at their own data.
- 2 Then invite students to create a class graph on the board by completing the following steps.
 - Get a sticky note from you.
 - Return to their desks or tables and find the Many Colors Record Sheet in their Student Book.
 - Write their name on the sticky note and then record the color that appeared most frequently in their bag of items.
 - Post their note on the board above the appropriate color name, working from the bottom up.
 - Sit down quietly in the discussion circle and watch the class graph take shape. Each partner should fill out her own sticky note. It's a duplication of data, but makes a more effective graph.
- 3 Next, ask students to share observations about the class graph, first in pairs and then as a whole group.





Creating graphs is one way to model with mathematics. In this case, students create a graph to draw conclusions about their recent investigation. The graph not only represents individual quantities, but as a whole creates a picture of the situation that helps students analyze it mathematically.

Here are some questions you can use to start and extend the discussion:

- What observations can you make about our class graph? What does it tell you?
- Does the shape of the graph look different than the shape of your graph? Why do you think that is?
- Do you think the students in the second grade classroom across the hall had similar results? Do you think most of them found more browns or yellows in their bags than anything else?
- If we bought some new bags of items at the store tomorrow, how likely do you think it would be to find a bag where there were more blue than any other color? What about green or red?

- 4 Now display a copy of the Telling More About Our Graphs Student Book page, and review the first section, Thinking about the Items in My Bag.
 - Ask students to share strategies for finding the difference between the number of items they thought they would have in their bags, and the number of items they actually found.
 - Let them know that they can use Unifix cubes, base ten area pieces, bundles & sticks, or an open number line as tools to help find the difference.
 - Remind students to show their work for problem 3, using numbers, sketches, or words.
- 5 Then review the second section of the Telling More About Our Graphs Student Book page, Looking at My Many Colors Graph.
 - Let students know that you will return the graphs they each made during the previous session, and they will use the information on their own graph to respond to the questions in the second section of the sheet.
 - Demonstrate how to write equations to represent the data on a graph you have borrowed from one of the students.



Teacher What equations could we write about the information on this graph?

Student What do you mean?

Teacher How could I take information from this graph and write about it in number form? If I wanted to say something about the greens and blues, for instance, how could I say it in numbers? **Thanh** There are 5 greens and 2 blues. You could say that. **Teacher** What if I wanted to combine those two numbers? **Bo** You could add the greens and blues. That would be 5 plus 2. **Teacher** So I could write 5 + 2 = 7. Would that be a true statement about this graph?

Students Yes!

Teacher What's the difference between the greens and blues on this graph?

Callie There are more greens than blues.

Teacher How many more greens are there than blues? And how could I use an equation to show the difference?

Devon Three more greens than blues.

Robin You could write 2 + 3 = 5, because if you start with 2 blues and then count on 3 more, you get 5.

Teacher That's true. Does anyone remember another way to show the difference between 2 numbers?

Asa You can show it on a number line, like just start at 2 and hop 3 more to get to 5.

Esteban If you go 5 - 2 = 3, it means that the difference between 2 and 5 is 3.

Maria I have another equation! You could add up the last three columns like this. 0 + 18 + 8 = 26.

- 6 Finally, review the last section of the Telling More About Our Graphs Student Book page, Looking at a Classmate's Many Colors Graph.
 - Explain that students will trade graphs with a partner once they have both finished the first two parts of the assignment, and then work to write two problems about their partner's graph that can be answered by writing and solving equations.

Ask students to trade graphs with someone other than the person that worked with them to create their graph.

• Use the student graph you have already borrowed to model posing one problem about the data, then writing and solving an equation to get the answer.

Teacher Let's use the same graph again to think of a problem we could pose about the information. Any ideas?

Tanner You could ask which color you thought she liked best.

Teacher You could, but the instructions say you need a question that can be answered by writing and solving an equation.

Asa How about asking which color she saw the most?

Chase That might not work either. How would you write an equation for that?

Teacher That would be a challenge. Maybe you could pose a comparing problem, where you asked how many more of one color than another.

Devon I've got it! You could have one where the number is missing, like 2 plus something is 18. See, there's way more browns than blues, so you could make a problem where people have to figure out how many more browns there are.

Esteban You could make one where they have to add up all the numbers.

Teacher How would that work? What would the problem be? Talk to the person next to you. What problem could you pose that would result in an equation where all the numbers are added?

Monica How many things are there on the whole graph? Then you'd have to write 8 + 5 + 2 + 18 + 8, and get the answer.

- 7 Once students understand what to do, give them the rest of the session to complete the assignment.
 - Return their completed graphs from the previous session so they can refer to them as they work.
 - Have them find the Telling More About Our Graphs page in their own Student Books.
 - Circulate to assist as needed.

Work Places

- 8 Invite students who finish the assignment before the end of the session to get their folders and go to Work Places.
- 9 Close the session.
 - Have students clean up and put away the Work Place bins.



Teacher Masters

GRADE 2 – UNIT 3 – MODULE 4



NAME





DATE

T1

Student Book

GRADE 2 – UNIT 3 – MODULE 4



Many Colors Record Sheet

- 1 How many items do you think will be in your bag? _____
- 2 Which color do you think there will be the most of in your bag? _____
- **3** Why do you think there will be the most of that color?



DATE

- **4** Do you think all the other bags of items in the room will have the most of the same color too? _____
- **5** Please record how many of each color you actually found in your bag.

red	areen	blue	vellow	brown	orange
ieu	green	Dide	yenow	DIOWII	orange

6a How many items did you have in all?

b Use the space here to show how you figured out the total number of items.

7 When you and your partner shared the items equally, how many did you each get?

Telling More About Our Graphs page 1 of 2

Thinking About the Items in My Bag

1 How many items did you think you would have in your bag? _____

2 How many items did you actually have in your bag? _____

- **3** What was the difference between your estimate and the actual number?
 - Use numbers, sketches, and/or words to help solve the problem.
 - Show your work below.
 - Write your answer on the line.



| DATE

The difference between my estimate and the number of items I actually got was _____.

Looking at My Many Colors Graph

- **4** Which color did you get most of in your bag? _____
- **5** Which color did you think you'd get the most of? _____
- **6** Which color did you get the fewest of?
- 7 Were there more browns or more yellows in your bag? _____
- 8 How many more?
- **9** Write at least 3 different equations about the information on your graph.

(continued on next page)

NAME

Telling More About Our Graphs page 2 of 2

Looking at a Classmate's Many Colors Graph

10 Write the name of the person who made the graph you are using.

- **11** Write two problems someone could solve by looking at your partner's graph. The problems should be the kind that can be answered with an equation.
 - **a** Problem 1:

b Problem 2:

- **12** Now solve the two problems you just posed about your partner's graph. Use an equation to show and solve each problem.
 - **a** Equation for and answer to Problem 1:

b Equation for and answer to Problem 2:



13 Share your problems and equations with your partner.



Home Connections

GRADE 2 – UNIT 3 – MODULE 4


Sorting & Graphing a Collection page 1 of 3

Note to Families

One of the mathematical topics we study in second grade is data analysis—collecting, graphing, and interpreting data. In this Home Connection, your child gets to organize and present information about one of his or her collections, or about a collection you have around the home. There are many sets of things that would work: rocks, shells, buttons, toy cars, stamps, books, cans of food, Legos, and so on. The only requirement is that there be 30 or more items in the collection and that there is enough variation in the items so they can be sorted in several different ways.

DATE

Sorting a Collection

Find a collection of some type around your home. It can be almost anything—rocks, shells, action figures, buttons, nuts and bolts, crayons, sports cards, etc. The collection you use for this assignment should have somewhere between 30 and 100 items. Once you've decided on your collection, work with someone in your family to sort it in as many ways as you can. List your ideas on the next page.

Here's an example: Suppose I decide to sort my collection of toy cars. I could sort them by 2-door and 4-door, as I have in this picture. (I didn't have room to show all 30!) I could also sort them by color, size, make, or type. See if you can think of at least 5 different ways to sort your collection.



(continued on next page)

NAME

Sorting & Graphing a Collection page 2 of 3

Here's what I collected:

Here's how many there were in my collection:

Here are some ways we sorted the things in my collection:

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Graphing a Collection

Look at all the ways you just sorted your collection. Now pick your favorite and make a graph about it on the back of this sheet. Here are some things to remember as you make your graph:

- 1 You don't have to mark all the columns if you don't need them, but be sure to label each column that you use.
- **2** If you have more than 10 items in any group, you'll have to make your graphing boxes stand for more than 1. It's okay to have each box stand for 2, 5, or even 10, depending on how many things you have to graph. Just remember to write your numbers in the boxes up the side so that we know how much each stands for.
- **3** Be sure to give your graph a title so that we understand what it's about.

(continued on next page)

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NAME

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Sorting & Graphing a Collection page 3 of 3





Digital Resources

GRADE 2 – UNIT 3 – MODULE 4



Unit 3 Module 4 Digital Resources

These resources, selected from the curated collection at the Bridges Educator site, can be used to extend instruction and support students during this module.

Apps by The Math Learning Center

Number Pieces

This app allows students to manipulate base ten pieces and write on the screen. One advantage to these virtual base ten pieces is that students can group units to make strips, and strips to make mats—something not possible with physical base ten pieces. You might make the Number Pieces Basic app available to students to use in modeling and solving the story problems posed throughout the unit, especially in activities that involve physical sticks and bundles or base ten pieces.

catalog.mathlearningcenter.org/apps/number-pieces

Number Line

This app helps students visualize number sequences and model strategies for addition, subtraction, multiplication, and division. It can be used to represent sequences of numbers, including whole numbers and multiples of a variety of numbers. Students can use what they know about number relationships and computation to identify missing elements of sequences shown on the number line.

catalog.mathlearningcenter.org/apps/number-line

Additional Resources

Graph Maker

Consider allowing your students to use an online graphing tool as an alternative to the penciland-paper graphing form provided in Module 4, Session 2. The Graph Maker is simple enough that second graders can use it effectively to display the color data collected during Session 1.

www.amblesideprimary.com/ambleweb/mentalmaths/grapher.html

Data Grapher

Extend graphing activities in this module by quickly showing data on bar graphs, line graphs, pie charts, and picture graphs.

illuminations.nctm.org/Activity.aspx?id=4098

Time Lapse M&M Portrait

Watch time-lapse video of an artist creating a mosaic portrait using 4,800 M&Ms. The video description of the project is rich with possibilities for creating mathematical challenges for interested students.

www.youtube.com/watch?v=HIEbhkazXw4



Virtual Manipulatives

Additional apps, including the Number Rack and Geoboards, are available free from the Math Learning Center for web, iOS and other platforms.

Math Vocabulary Cards

The Math Vocabulary Cards app (available for web and iOS) helps students deepen their conceptual understanding of key terms in mathematics. Each card features a math term, a representative example or model, and a concise definition.

Bridges Educator Site Resources

The following resources are available to Bridges classrooms at the Bridges Educator site.

Interactive Whiteboard Files

Interactive whiteboard files in SMART Notebook and IWB formats for the teacher masters in each module.

Family Overviews

Brief overviews of each Bridges unit, designed to be sent home to families. Available in English and Spanish.

Support & Intervention

Targeted instruction and support, addressing Tier 2 within the Response to Intervention framework. Each volume contains activities, games, and practice pages that can be used for reteaching, practice, and progress monitoring.





BRIDGES GRADE ASSESSMENT **GUIDE**

Scoring Guides & Answer Keys Unit 3



Published by The MATH LEARNING CENTER Salem, Oregon

Bridges Unit 3 Assessments Addition & Subtraction Within One Hundred

Overview

This unit focuses on two different strategies for multi-digit addition and subtraction to 100—jumping and splitting. The open number line that grew out of students' work with Unifix cube trains in Unit 2 is developed as a way to model and solve double-digit computation by using "skip-jumps" based on multiples of 5 and 10. Bundles & sticks, as well as base ten pieces (mats, strips, and units) are presented as models for dealing with double-digit computation. The bundles & sticks model explicitly encourages students to split numbers by place value, and then add or subtract tens to or from tens, and ones to or from ones. Together, the two models offer good foundations on which to help students build powerful place value skills and understandings, as well as a variety of invented algorithms for adding and subtracting double-digit numbers as they solve computation and story problems throughout the unit.

There are three written assessments in Unit 3—a unit pre-assessment at the beginning of Module 1, a checkpoint at the end of Module 2, and a unit post-assessment at the end of Module 3. Teachers can also collect some of the story problem solutions generated by students at the end of Module 3 and score them as work samples. In addition to these, five Work Places introduced over the course of the unit offer teachers frequent opportunities to observe students' skills in authentic settings.

Detailed instructions for preparing and conducting these assessments can be found in the Unit 3 Bridges Teachers Guide. Teachers can use the materials listed in the chart below, and found in the pages that follow, to inform instructional decisions. These materials include an answer key and scoring guide for each of the written assessments and an optional work sample scoring guide. You'll also find a Work Place Differentiation Chart for consolidating observations of students' math skills along with any instructional plans you make to address them. In addition, a Math Practices Observation Chart is included at the end of this guide for tracking how students apply the CCSS mathematical practices.

Assessments	Materials	Description
Work Places 3A-3E Module 1, Sessions 3, 5 Module 2, Session 4 Module 3, Sessions 1, 5	Page A4 Unit 3 Work Place Differentiation Chart	Teachers have ongoing opportunities during Work Places in Unit 3 to observe students as they play games that involve skip-counting by 10s off the decade, building and compar- ing 3-digit numbers, adding and subtracting within 100, and solving basic addition facts. Guides that accompany each Work Place advise teachers about specific behaviors and skills to look for and suggest appropriate on-the-spot intervention (support or challenge).

Observational Assessments

Written Assessments

Materials	Description					
Unit 3 Pre-Assessmer	nt Module 1, Session 1					
Pages A5-A8 Answer Key Pages A9-A10 Scoring Guide	The Unit 3 Pre-Assessment is designed to help teachers gauge students' skills with using linear and discrete models for showing and solving double-digit addi- tion and subtraction combinations and story problems. Ascertaining students' skills before teaching the unit enables teachers to identify those students likely to need extra support or challenge in the coming month.					
Addition & Subtraction Checkpoint Module 2, Session 5						
Pages A11–A13 Answer Key Page A14 Scoring Guide	This checkpoint gives teachers an opportunity to see how well students are doing with the instruction offered during the sessions and Work Places in Unit 3 after two weeks of work. The results of this assessment can be used to help identify students who may not be responding optimally to classroom instruction, or who may be struggling with one or more of the concepts taught.					

A1

Materials	Description							
Unit 3 Post-Assessme	nt Module 3, Session 7							
Pages A15–A18 Answer Key Pages A19–A20 Scoring Guide	The Unit 3 Post-Assessment is very similar to the Unit 3 Pre-Assessment, making it possible to compare students' responses from the beginning of the monthlong instructional period to their responses at the end. This provides one way of measuring each student's progress toward mastering the learning objectives of the unit.							
Presents & Parcels St	Presents & Parcels Story Problems Work Sample Module 3, Sessions 6, 7							
Page A21 Scoring Guide	The fact that students solve a variety of double-digit addition and subtraction story problems at the end of Unit 3 presents an opportunity to collect and score work from the end of an intensive unit of instruction. Teachers who need to collect written evidence of students' use of Math Practices may want to make use of this and other work sample opportunities.							

Skills & Concepts Assessed in Unit 3

Skills & Concepts Assessed	Observational Assessments	Written Assessments
2.OA.1 Use addition and subtraction within 100 to solve one- and two-step story 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		M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S6–7 Presents & Parcels Story Problems Work Sample M3, S7 Unit 3 Post-Assessment
2.OA.2 Fluently add and subtract with sums to 20 using mental strategies	M1, S3 3A Star Power M2, S4 3C Hit the Zone M3, S5 3E Target Twenty	
2.NBT.1 Demonstrate and understand- ing that the digits in a 3-digit number represent amounts of hundreds, tens, and ones	M3, S1 3D Base Ten Triple Spin	
2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s	M1, S3 3A Star Power M3, S1 3D Base Ten Triple Spin	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment
2.NBT.3 Read and write numbers to 1,000 represented with base ten numerals and expanded form	M3, S1 3D Base Ten Triple Spin	
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, or the relationship between addition and subtraction	M1, S3 3A Star Power M1, S5 3B Five in a Row	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment
2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations		M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment
2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units		M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment
2.MD.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	M2, S4 3C Hit the Zone	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment

Assessment Map

The Grade 2 Assessment Map indicates when mastery of each standard is expected over the course of the school year. Reviewing this map in conjunction with the Skills Across the Grade Level Chart in the unit introduction can be helpful in contextualizing students' performance on a particular skill addressed in a given unit.

M – Module, S – Session

Support & Intervention

Your interactions with students during daily instruction, along with the observational and written assessments in Unit 3, should give you a pretty clear picture of each student's progress with doubledigit computation. Too, these assessments will help point up students' favored strategies for solving 2-digit addition and subtraction problems. While it's possible that some of your students will be equally comfortable using jumping and splitting strategies, there's a good chance that the discrete thinkers in your group will find it easier to use base ten pieces or bundles & sticks, while children who are interval thinkers will favor working on the open number line. Given that both models will be revisited in Units 5, 7, and 8, it's to your advantage to know your students' preferences. You might also be alert to the fact that students who prefer working with discrete models (base ten pieces and bundles & sticks) may struggle with the length measurement activities in Units 4 and 7, given that measuring length involves working with intervals or distances between points.

At this point, you should be concerned about those students struggling with the number and computation skills to 100 that were taught in first grade, including any of the competencies listed below.

- Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral (1.NBT.1)
- Count by 5s and 10s to 100 (supports 1.NBT)
- Group and count objects by 10s and 5s (supports 1.NBT)
- Demonstrate an understanding that the digits in a 2-digit number represent amounts of tens and ones (1.NBT.2)
- Compare two 2-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and < (1.NBT.3)
- Add a 1-digit number and a 2-digit number (1.NBT.4)
- Add a multiple of 10 (up to 80) and another 2-digit number (1.NBT.4)
- Mentally find the number that is 10 more or 10 less than a given 2-digit number, without counting (1.NBT.5)
- Subtract a 2-digit multiple of 10 from an equal or greater 2-digit multiple of 10 (1.NBT.6)

You'll find reteaching and practice activities to support these students in the Support & Intervention volumes, which are located in the Curriculum section of the Bridges Educator site. The Resources section of the site also includes online games that can be used for practice with targeted skills. You can use these resources in a number of ways:

- Conduct the reteaching activities with a small group of students while the rest of the class is at Work Places or doing some other independent task.
- Use Support games as a way to reteach, and then turn the games over to students, much as you do with Work Places, for additional practice.
- Send the games or practice pages home with students for additional support.
- Ask your resource room teacher to work with students using any of the Support & Intervention resources or online games.
- Have students play the online games in the resource room or during Work Place time in your classroom. Students who have computers with Internet access can play them at home as well.

А3

Chart	
erentiation	
Place Diff	
nit 3 Work	

Guides for each of the Work Places listed below can be found in the Unit 3 teacher masters. Each Work Place Guide includes assessment and differentiation tips specific to the skills addressed in that particue or activity. You can use this sheet to list students who need summort or challence with skills addressed in the Unit 3 Work Places and to not estimational plans for those students ~~~~~

		Students		
Work Places	Skills	Support	Challenge	Comments
3C Hit the Zone 3E Target Twenty	Addition Fact Strategies Fluently add with sums to 20 using mental strategies (2.0A.2)			
3C Hit the Zone 3E Target Twenty	Subtraction Fact Strategies Fluently subtract with minuends to 20 using mental strategies (2.0A.2)			
3A Star Power	Addition Fact Recall Recall from memory all sums of two 1-digit numbers (2.0A.2)			
3D Base Ten Triple Spin	Place Value (3 Digits) Demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones (2.NBT.1)			
3A Star Power 3D Base Ten Triple Spin	Count by 10s and 100s Skip-count by 10s and 100s within 1,000 (2.NBT.2)			
3D Base Ten Triple Spin	Read & Write Numbers to 1,000 Read and write numbers to 1,000 represented with numerals and in expanded form (2.NBT.3)			
3D Base Ten Triple Spin	Compare Three-Digit Numbers Compare pairs of 3-digit numbers, based on an understanding of what the digits in their hundreds, tens, and ones places represent and use >, =, and < symbols to record the comparisons (2.NBT.4)			
3A Star Power 3B Five in a Row	Two-Digit Addition Strategies Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 100 (2.NBT.5)			
3B Five in a Row	Two-Digit Subtraction Strategies Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to subtract fluently with minuends to 100 (2.NBT.5)			
3C Hit the Zone	Numbers on the Number Line Represent whole-numbers as lengths on a number line (2.MD.6)			
3C Hit the Zone	Addition & Subtraction on the Number Line Represent whole-number sums and differences within 20 on a number line (2.MD.6)			

DATE



Unit 3 Pre-Assessment page 1 of 4 Answer the following questions. Show your work. 1 Bob raced his toy car three times in a row. The car went 10 feet, 12 feet, and 13 feet. How many feet did the toy car travel in all? Mark each distance the car raced on this number line. Label the number it ended on. Student work will vary. Students who are experienced with number lines may place marks for 10, 20, 30 and possibly 40, then add marks for the extra 2 and 3 feet; others will jump 10, 12, 13 and some may count 10, then 25 or even 35 in one jump. 0 Bob raced the toy car <u>35</u> feet in all. 2 Bambam the kangaroo did the triple jump. She jumped 32 feet, 33 feet, and 35 feet. How many feet did Bambam jump in all? _ Mark Bambam's jumps on this number line. Label the number she ended on. As above, student work will vary. 0 Bambam jumped <u>100</u> feet in all. (continued on next page) © The Math Learning Center | mathlearningcenter.org Bridges in Mathematics Grade 2 Teacher Masters T1 SAMPLE VERSION Bridges in Mathematics Grade 2 Assessment Guide Α5 © The Math Learning Center | mathlearningcenter.org SAMPLE VERSION



A6





Points Possible	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for any combination of 15, 55, and 105 that totals 47 	1 pt.	 3 pts. 1 pt. for counting the collection of sticks correctly 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 	Subtotal page 1
ccss	2.OA.1 2.NBT.5 2.NBT.6 2.MD.5 2.MD.6	2.0A.1 2.NBT.5 2.NBT.6 2.MD.5 2.MD.6	2.NBT.2 2.NBT.6 2.MD.6	1.NBT.2 2.NBT.2	1.NBT.2 2.OA.1 2.NBT.2 2.NBT.5	
Item & Correct Answer	1 Adds 3 double-digit numbers pre- sented in a story problem context; shows work on a number line. 35 feet	2 Adds 3 double-digit numbers pre- sented in a story problem context; shows work on a number line. <i>100 feet</i>	3 Uses a combination of 1s, 5s, and 10s to total 47; shows work on a number line. Students' responses will vary. Sample: 4 hops of 10, 1 hop of 5, and 2 hops of 1	4 Counts a collection of sticks grouped by tens and ones. <i>67 sticks</i>	5 Counts a collection of sticks grouped by tens and ones, and adds 23 to the collection. Shows work. <i>79 sticks</i>	
	Item & Correct Answer CCSS Points Possible	Item & Correct Answer CCSS Points Possible 1 Adds 3 double-digit numbers pre- sented in a story problem context; shows 2:0A:1 2 pts. a story problem context; shows 2:NBI.5 • 1 pt. for correct representation of the problem on the number line 3 feet 2.MD.5 • 1 pt. for the correct answer	Item & Correct AnswerCCSSPoints Possible1 Adds 3 double-digit numbers pre- sented in a story problem context; shows2.0A.12 pts.2 .NBT.60 pt for correct representation of the work on a number line.1 pt for correct representation of the problem on the number line.0 PI2 .MBT.62.0A.12 pts.2 .MBT.61 pt for the correct representation of the work on a number line.0 PI2 .MBT.62.0A.12 pts.3 feet2.0A.12 pts.2 .MBT.62 pts.0 PI2 .MBT.62 pts.2 .MBT.62 pts.2 .MBT.62 pts.2 .MBT.61 pt for the correct answer2 .MBT.62 pts.2 .MBT.61 pt for correct enseentation of the work on a number line.2 .MDT.61 pt for the correct answer2 .MDT.61 pt for the correct answer	Item & Crrrect AnswerCCSSPoints Possible1 Adds 3 double-dign numbers pre- sented in a story problem context; shows 2.MD52.0A.12 ps.1 Adds 3 double-dign numbers pre- sented in a story problem context; shows 2.MD52.0A.12 ps.2 Adds 3 double-dign numbers pre- sorted in a story problem context; shows 2.MD52.0A.12 ps.2 Adds 3 double-dign numbers pre- sorted in a story problem context; shows 2.MD52.0A.12 ps.2 Adds 3 double-dign numbers pre- sorted in a story problem context; shows 2.MD52.0A.12 psr.2 Adds 3 double-dign numbers pre- sorted in a story problem context; shows vork on a number line.2.0A.12 psr.2 Adds 3 double-dign number line. 100 feet2.0A.12 psr.2 psr.3 Uses a combination of 15.5, and 10s2.0MD51 pt. for the correct answer2 psr.3 Uses a combination of 15.5, and 10s of 5.5,	Item & Correct AnswerCCSDimts Possible1 Adds 3 double-dight numbers pre- sented in a story problem context; shows 2 NBTs 2 NBTs 	Image and the image of the position of the model of t

i it 3 Pre-Assessment Scoring Guide page 2 of 2		ου

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ltem & Correct Answer	ccss	Points Possible	
6 Finds the difference between 7 and 20; shows work on a number line. <i>13 years</i>	2.0A.1 2.MD.6	2 pts. • 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer	
 Finds the difference between 10 and 78; shows work on a number line. 68 years 	2.0A.1 2.MD.6	2 pts. • 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer	
8 Labels 21, 37, and 85 on a number line.	2.MD.6	3 pts. 1 pt. for each number placed and labeled correctly 	
9 Counts by tens and ones to determine how many gifts there are in the picture. <i>44 gifts</i>	1.NBT.2 2.NBT.2	1 pt.	
10 Counts by 10s and 1s to determine how many gifts there are at the table and in the closet. Compares the two quanti- ties to determine which is more and by how much. Shows work. Zach has 2 more presents than Bart.	2.0A.1 2.NBT.5	 3 pts. 1 pt. for counting both collections of presents correctly 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 	
		Subtotal page 2	
		Subtotal from page 1	
TOTAL SCORE/LEVEL OF PROFICIENC	:Y*	21 pts.	



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Bridges in Mathematics Grade 2 Assessment Guide SAMPLE VERSION



Addition & Subtraction Checkpoint Scoring Guide

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Item & Correct Answer	CCSS	Points Possible	 	·	 	 ·	
1 Counts by 10s to identify missing numbers along a number line 10, 20, 60	2.NBT.2 2.MD.6	3 pts.					
2 Places 6 numbers between 0 and 40 accurately on a number line marked in tens. Makes and labels new marks along the line for 4 of the numbers, 5, 15, 22, and 35.	2.NBT.2 2.MD.6	6 pts.					
 3 Uses an open number line to model and find the difference between 34 and 12. 22 	2.NBT.5 2.MD.6	 2 pts. 1 pt. for a viable representation of the situation on the number line 1 pt. for the correct answer 					
 4 Uses an open number line to model and find the difference between 45 and 21. 24 	2.NBT.5 2.MD.6	 2 pts. 1 pt. for a viable representation of the situation on the number line 1 pt. for the correct answer 					
5 Counts a collection of sticks grouped by tens and ones. <i>46 sticks</i>	2.NBT.2	1 pt.					
6 Counts two collections of sticks grouped by tens and ones and adds the quantities to find the total. 34 sticks, 55 sticks, 89 sticks in all	2.NBT.2 2.NBT.5	 3 pts. 1 pt. each for counting the quantities of sticks correctly 1 pt. for the correct total 					
7 Solves a story problem that involves adding 43 and 29. Shows work. 72 sticks	2.OA.1 2.NBT.5	 2 pts. 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 					
8 Solves a story problem that involves subtracting 32 from 58. 26 sticks	2.OA.1 2.NBT.5	 2 pts. 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 					
9 Uses the fewest jumps of 1, 5, and 10 to get from 0 to 36 on a number line. 5 jumps: 3 jumps of 10, 1 jump of 5, and 1 jump of 1, in any order	2.NBT.2 2.MD.6 2.MP.5	 2 pts. 1 pt. for any correct combination of jumps other than 36 jumps of 1 1 pt. for using the fewest possible jumps 					
10 Uses the fewest jumps of 1, 5, and 10 to get from 0 to 44 on a number line. 6 jumps: 4 jumps of 10, 1 jump of 5, and 1 backward jump of 1	2.NBT.2 2.MD.6 2.MP.5	 2 pts. 1 pt. for any correct combination of jumps other than 36 jumps of 1 1 pt. for using the fewest possible jumps 					
TOTAL SCORE/LEVEL OF PROFIC	IENCY*	25 pts.					

* Meeting Standard 19-25 points (75%-100% correct) Approaching Standard 13-18 points (50-74% correct) Strategic 7-12 points (25-49% correct) Intensive 6 points or less (24% or less correct)

Bridges in Mathematics Grade 2 Assessment Guide SAMPLE VERSION







A17



əmsV tnəbut2	Points Possible	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for any combination of 5s, 10s, and 20s that totals 115 	1 pt.	 3 pts. 1 pt. for counting the collection of sticks correctly 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 	Subtotal page 1
	ccss	2.OA.1 2.NBT.5 2.NBT.6 2.NBT.6 2.MD.5 2.MD.6	2.0A.1 2.NBT.5 2.NBT.6 2.ND.5 2.MD.5 2.MD.6	2.NBT.2 2.NBT.6 2.MD.6	1.NBT.2 2.NBT.2	1.NBT.2 2.OA.1 2.NBT.2 2.NBT.5	
	ltem & Correct Answer	 Adds 3 double-digit numbers pre- sented in a story problem context; shows work on a number line. 38 feet 	2 Adds 3 double-digit numbers presented in a story problem context; shows work on a number line. 108 feet	3 Uses a combination of 5s, 10s, and 20s to total 115; shows work on a number line. <i>Students' responses will vary (5 hops of</i> 20, 1 hop of 10, and 1 hop of 5	4 Counts a collection of sticks grouped by 10s and 1s. <i>117 sticks</i>	5 Counts a collection of 56 sticks grouped by 10s and 1s, and adds 44 to the collection. Shows work. <i>100 sticks</i>	

		9msW fn9but∂	
Item & Correct Answer	ccss	Points Possible	
 6 Finds the difference between 15 and 100; shows work on a number line. 85 years 	2.0A.1 2.MD.6	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	
7 Finds the difference between 45 and 98; shows work on a number line.	2.0A.1 2.MD.6	 2 pts. 1 pt. for correct representation of the problem on the number line 1 pt. for the correct answer 	
8 Labels 17, 43, and 91 on a number line.	2.MD.6	3 pts.1 pt. for each number placed and labeled correctly	
9 Counts by 10s and 1s to determine how many gifts there are in the picture.	1.NBT.2 2.NBT.2	1 pt.	
10 Compares the two quantities to determine which is more and by how much. Shows work. <i>Bart hid 35 more sticks than Zach</i> .	2.0A.1 2.NBT.5	 3 pts. 1 pt. for using the information in the story problem 1 pt. for using a viable procedure that could lead to the correct answer 1 pt. for the correct answer 	
		Subtotal page 2	
		Subtotal from page 1	
TOTAL SCORE/LEVEL OF PROFI	CIENCY*	21 pts.	
* Meeting Standard 16–21 points (75	%-100% c	orrect) Approaching Standard 11–15 poin	ints (50–74% correct) Strategic 6–10 points (25–49% correct) Intense 5 points or less (24% or less correct)

Unit 3 Work Sample Scoring Guide

Presents & Parcels Story Problems

Choose solutions to four problems for each student. You do not have to choose the same problems for each student; pull each student's best work from the set of solutions he generated during Unit 3, Module 3, Sessions 6 and 7.

		əmsN inəbui2			
ltem & Correct Answer	ccss	Points Possible	-	-	
1 Solution 1 Answer depends on the problem the student chose to solve.	2.0A.1 2.MP.1	3 pts. See Scoring Scale for Solving Story Problems below			
2 Solution 2 Answer depends on the problem the student chose to solve.	2.0A.1 2.MP.1	3 pts. See Scoring Scale for Solving Story Problems below			
3 Solution 3 Answer depends on the problem the student chose to solve.	2.0A.1 2.MP.1	3 pts. See Scoring Scale for Solving Story Problems below			
4 Solution 4 Answer depends on the problem the student chose to solve.	2.0A.1 2.MP.1	3 pts. See Scoring Scale for Solving Story Problems below			
TOTAL SCORE/LEVEL OF PROFICIENCY	*	12 pts.			
* Meeting Standard 9–12 points (75%–100% c	correct) A	pproaching Standard 6–8 points (50–74% correct) Strategic 3–5 points (25–49% correct) Intensive 2 points o	less (24% or less c	orrect)	

Understanding: 1 point for using the information given in the problem (i.e., the relevant quantities)
Strategy: 1 point for using a viable strategy that could lead to the answer
Answer: 1 point for showing the correct answer

Chart
rvation
es Obse
Practice
Math

You can use this chart to record notes about students' use of Math Practices during Bridges sessions and Work Places, as well as during Number Corner workouts. See the Grade 2 Correlations on the Bridges Educator site for the sessions and workouts most likely to elicit particular Math Practices.

	Habits of Mind	Reasoning & Explaining	Modeling & Using Tools	Seeing Structure & Generalizing
	2.MP.1 Make sense of problems and	2.MP.2 Reason abstractly and quantitatively	2.MP.4 Model with mathematics	2.MP.7 Look for and make use of structure
Students	2.MP.6 Attend to precision	 Construct viable arguments and critique the reasoning of others 	2.MP.5 Use appropriate tools strategically	 AMP.8 Look for and express regularity in repeated reasoning
		_		





BRIDGES GRADE ASSESSMENT 2 **GUIDE**

Assessment Map





Bridges Grade 2 Assessment Map

The Assessment Map indicates when mastery of each standard is expected. As one might predict, most of the Grade 2 Common Core Standards are targeted for mastery in the latter half of the year. For example, one of the major skills addressed in Unit 3 is double-digit addition and subtraction. While this skill is assessed several times during Unit 3, mastery is not expected until the end of Unit 5. By looking at the Skills Across the Grade Level chart in the Unit 3 introduction, teachers can see that double-digit addition and subtraction is addressed again in Units 4 and 5, as well as during the January and February Number Corner workouts. In other words, students who haven't fully mastered the skill by the end of Unit 3 will have many more opportunities to do so before a teacher needs to consider providing intervention outside of regular classroom instruction.

While it is tempting, and not unusual, for a program or a district to divide a set of grade-level standards into three or four piles and target each pile for mastery by the end of a particular quarter or trimester, this approach disregards the fact that skills and concepts involving higher levels of cognitive demand require more time to develop than others. It also tends to trivialize learning by breaking skills and concepts into small bits, rather than retaining the connections among them that support the focus, coherence, and rigor demanded by the Common Core Standards.

The fact is that most of the second grade standards involve a degree of cognitive demand beyond Level 1 (recall and recognition). Even a relatively simple skill, such as measuring the length of an object in U.S. customary units, is made more complex in that students are expected to select the most reasonable unit (inches, feet, or yards) for the particular task, select the most appropriate measurement tool, and justify their decisions. Furthermore, this particular skill is part of a larger conceptual complex that requires a deep and thorough understanding of linear measurement as a process of iteration—something that takes most students a couple of years' worth of instruction, experience, and practice to develop.

Standard 2.OA.1 provides another good example of the rigor and complexity the Common Core Standards demand. This standard has to do with using addition and subtraction within 100 to solve fifteen different types of word problems (add to, start unknown; take from, change unknown; compare, smaller unknown; and so on). Furthermore, second graders are expected to be able to solve word problems that involve two steps rather than just one. Can we not teach and expect mastery of the easier types of word problems earlier in the school year? Certainly, but in the end, students need to be able to comprehend what any given problem is asking, decide how many steps will be necessary to solve the problem, employ viable strategies using the information provided, demonstrate good number sense in the process, and explain and justify their thinking. This requires that they develop a rich network of interconnected skills and concepts, which takes time and many varied layers of experience and application. While we might reasonably expect incremental progress through the year in the three major second grade learning progressions (addition and subtraction, place value, and length measurement), the whole of each progression is much greater than the sum of a set of discrete parts. We best serve our students by viewing each unit of instruction as another layer in a yearlong journey toward mastery.

Grade 2 Assessment Map page 1 of 5	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	Магсһ ИС	Bridges Unit 7	Bridges Unit 8	Nay NC CGA	
1.0A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.		•												
 J.OA.4 Understand subtraction as an unknown- addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8. 	M1, S5 Unit 1 Pre-Assessment M2, S5 Number Combinations Checkpoint M4, S5 Unit 1 Post-Assessment													I
 DA.8 Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. 		•												
1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.		•												
1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. unumber represent amounts of tens and ones. Understand the following as special cases: a 10 can be thought of as a bundle of ten ones, called a 'ten." Then." The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one two, three, four, five, six, seven, eight, or nine tens (and 0 ones).		•			M1, 51 Unit 3 Pre-Assessment M3, 57 Unit 3 Post-Assessment									
1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $> =$, and <.	M1, S5 Unit 1 Pre-Assessment M4, S5 Unit 1 Post-Assessment	•												
1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place walue, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.		•												
1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.		•												
1.NBT.6 Subtract multiples of 10 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 and explain the reasoning used.		•												
NC – Number Corner, M# – Module number, S# – Session n	umber, CGA – Compre	ehensiv	e Growth Assessmer	E E	ilue indicates Bridges u	nit or Number Corner	month	in which a skill is tar	geted for mastery.	Yel	llow indicates review	and extension of a Grad	de 1 skill.	
Assessment Map)													
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CGA		•												
May NC		٠												
Bridges Unit 8														
Bridges Unit 7		M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment												
Магсћ ИС		•												
Bridges Unit 6														
s														

Grade 2 Assessment Map page 2 of 5	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	Магсһ ИС	Bridges Unit 7	Bridges Unit 8	CGA MIRY NC
1.MD.2 Express the length of an object as a whole number of length units. by laying multiple copies of a shorter object the length unity end to end, understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.		•	M1, S2 Unit 2 Pre-Assessment M2, 54 Measuring Checkpoint M3, S7 Unit 2 Post-Assessment										
 1.G.3 Partition circles and rectangles into two and four equal shares; describe shares using appropriate language. 		•											
2.OA.1 Use addition and subtraction within 100 to solve one-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.	M1, 55 Unit 1 Pre-Assessment M4, 55 Unit 1 Post-Assessment			•	M1, 51 Unit 3 Pre-Assessment M2, 55 Addition & Subtraction Checkpoint M3, 55 Work Sample M3, 57 Unit 3 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M3, S6 Unit 4 Post-Assessment	•			•	M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment		•
2.OA.1 Use addition and subtraction within 100 to solve two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.						M1, S1 Unit 4 Pre-Assessment M3, S6 Unit 4 Post-Assessment					M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment		•
2.0A.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.	M1, S5 Unit 1 Pre-Assessment M2, S5 Number Combinations Checkpoint M4, S5 Unit 1 Post-Assessment			٠			•			•			•
2.0A.3 Determine whether a group of objects (up to 20) has an odd or even number of members write an equation to express an even number as a sum of two equal addends.	M1, S5 Unit 1 Pre-Assessment M4, S5 Unit 1 Post-Assessment			٠									•
2.0A.4 Use addition to find the total number of objects arranged in rectanginal arrays with up to 5 objects and up to 5 columns write an equation to express the total as a sum of equal addends.			M1, S2 Unit 2 Pre-Assessment M2, S1 Place Value Checkpoint M3, S7 Unit 2 Post-Assessment	•		M4, S4 Work Sample			M1, S1 Unit 6 Pre-Assessment M3, S6 Unit 6 Post-Assessment				•
 2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones: ones: e.g. Yole equals 7 hundreds, otens, and 6 ones. a 100 can be thought of as a bundle of ten tens, called a "hundred." 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). 			M1, S2 Unit 2 Pre-Assessment M2, 51 Place Value Checkpoint M3, 57 Unit 2 Post-Assessment				•	M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment					•
NC – Number Corner, M# – Module number, S# – Session r	number, CGA – Compre	hensiv	ve Growth Assessmen		Blue indicates Bridges	unit or Number Corner	r mont	h in which a skill is ta	rgeted for mastery.	×	ellow indicates review	and extension of a Grade	1 skill.

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orage z Assessment Map page 3 of 5	Bridges Unit 1	September NC	Bridges Unit 2	October NC	Bridges Unit 3	Bridges Unit 4	January NC	Bridges Unit 5	Bridges Unit 6	Магсћ ИС	Bridges Unit 7	Bridges Unit 8	DN Y6M	ADD
2.NBT.1a 100 can be thought of as a bundle of ten tens, called a "hundred."							•	M1, S5 Three-Digit Numbers Checkpoint						•
2.NBT 1b 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).							•	M1, S5 Three-Digit Numbers Checkpoint						•
2.NBT.2 Count within 1000; skip-count by fives, tens, and hundreds.			M2, S4 Checkpoint	•	M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment		•	M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment						•
2.NBT.3 Read and write numbers to 1000 using base- ten numerals, number names, and expanded form.			M1, S2 Unit 2 Pre-Assessment M2, 51 Place Value Checkpoint M3, 57 Unit 2 Post-Assessment	•			•	M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment				M1, S2 Unit 8 Pre-Assessment M3, S5 Unit 8 Post-Assessment		•
2.NBT.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.								M1, 51 Unit 5 Pre-Assessment M1, 55 Three-Digit Numbers Checkpoint M3, 55 Unit 5 Post-Assessment		٠		M1, S2 Unit 8 Pre-Assessment M3, S5 Unit 8 Post-Assessment		•
2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.			M1, S2 Unit 2 Pre-Assessment M3, S7 Unit 2 Post-Assessment		M1, S1 Unit 3 Pre-Assessment M2, S5 Addition & Subtraction Checkpoint M3, S7 Unit 3 Post-Assessment			M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment		٠				•
2.1BT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.					M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M3, S6 Unit 4 Post-Assessment				•				•
2.NBT.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 threading the strategy to a written method. Understand that in adding or subtracting threading thre			M3, 57 Unit 2 Post-Assessment					M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment			M1, 51 Unit 7 Pre-Assessment M3, 55 Unit 7 Post-Assessment M4, 55 Work Sample	M1, 52 Unit 8 Pre-Assessment M3, 55 Unit 8 Post-Assessment	•	•
NC – Number Corner, M# – Module number, S# – Session r	number, CGA – Compre	ehensiv	e Growth Assessment	<u>۳</u>	Slue indicates Bridges u	unit or Number Corner r	month	in which a skill is tar	geted for mastery.					

CGA	•	•	•	•	•	•	•	•	
May NC		•	•		•	•	•	•	
Bridges Unit 8									
Bridges Unit 7		M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment	M1, S1 Unit 7 Pre-Assessment M2, 55 Metric Measuring & Fractions Checkpoint M3, 55 Unit 7 Post-Assessment		M1, S1 Unit 7 Pre-Assessment M2, 55 Metric Measuring & Fractions Checkpoint M3, 55 Unit 7 Post-Assessment	M1, S1 Unit 7 Pre-Assessment M2, 55 Metric Measuring & Fractions Checkpoint M3, 55 Unit 7 Post-Assessment	M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment		
Магсћ ИС		•							_
Bridges Unit 6									geted for mastery.
Bridges Unit 5	M1, S1 Unit 5 Pre-Assessment M1, S5 Three-Digit Numbers Checkpoint M3, S5 Unit 5 Post-Assessment	M1, S1 Unit 5 Pre-Assessment M3, S5 Unit 5 Post-Assessment							th in which a skill is tar
January NC	•								er mont
Bridges Unit 4			M1, S1 Unit 4 Pre-Assessment M2, S5 Inches, Feet & Yards Checkpoint M3, S6 Unit 4 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M2, S5 Inches, Feet & Yards Checkpoint M3, S6 Unit 4 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M2, S5 Inches, Feet & Yards Checkpoint M3, S6 Unit 4 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M2, S5 Inches, Feet & Yards Checkpoint M3, S6 Unit 4 Post-Assessment	M1, S1 Unit 4 Pre-Assessment M3, S6 Unit 4 Post-Assessment		unit or Number Corne
Bridges Unit 3							M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment	M1, S1 Unit 3 Pre-Assessment M3, S7 Unit 3 Post-Assessment	3lue indicates Bridges
October NC									-
Bridges Unit 2				M2, 54 Measuring Checkpoint		M1, 52 Pre-Assessment M2, 54 Measuring Checkpoint M3, 57 Unit 2 Post-Assessment		M1, S2 Unit 2 Pre-Assessment M3, S7 Unit 2 Post-Assessment	sive Growth Assessment
September NC									rehens
Bridges Unit 1									number, CGA – Comp
Grade 2 Assessment Map page 4 of 5	2.NBT.8 Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.	 2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations. 	2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	2.MD.2 Measure the length of an object twice, using length units of differentlengths for the two measure- ments; describe how the two measurements relate to the size of the unit chosen.	2. MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.	 2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. 	2.MD.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 or tulers) and equations with a symbol for the unknown number to represent the problem.	2.MD.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.	NC – Number Corner, M# – Module number, S# – Session

CGA	•	•	•	•	•	•	•	•	
May NC						•	•		
Bridges Unit 8			M1, S2 Unit 8 Pre-Assessment M3, S5 Unit 8 Post-Assessment						
Bridges Unit 7		M1, S1 Unit 7 Pre-Assessment M3, S5 Unit 7 Post-Assessment M4, S5 Work Sample					M1, S1 Unit 7 Pre-Assessment M2, S5 Metric Measuring & Fractions Checkpoint M3, S5 Unit 7 Post-Assessment		
March NC	•	•			•				
Bridges Unit 6					M1, S1 Unit 6 Pre-Assessment M3, S6 Unit 6 Post-Assessment	M1, S1 Unit 6 Pre-Assessment M3, S6 Unit 6 Post-Assessment	M1,51 Unit 6 Pre-Assessment M3,56 Unit 6 Post-Assessment	M1, S1 Unit 6 Pre-Assessment M3, S6 Unit 6 Post-Assessment	rgeted for mastery.
Bridges Unit 5		M1, S1 Unit 5 Pre-Assessment M2, 56 Money Checkpoint M3, 55 Unit 5 Post-Assessment							th in which a skill is ta
January NC				•					er mon
Bridges Unit 4									es unit or Number Corne
Bridges Unit 3									Blue indicates Bridge
October NC	•								Ţ
Bridges Unit 2									sive Growth Assessme
September NC									rehen
Bridges Unit 1									number, CGA – Comp
Grade 2 Assessment Map Dage 5 of 5	2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using 5 and c symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or ynaking 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.	2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four compare problems using information presented in a bar graph.	2.G.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.	2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	2.6.3 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 thirds, four fourths.	2.G.3 Recognize that equal shares of identical wholes need not have the same shape.	NC – Number Corner, M# – Module number, S# – Session