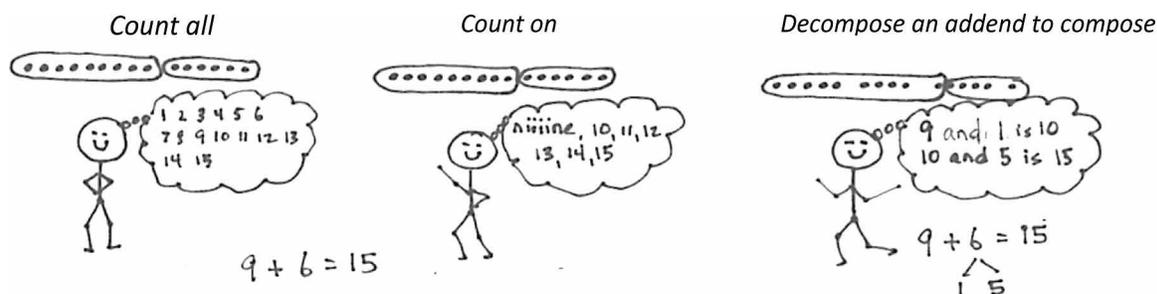


Grade 1 • Module 2

Introduction to Place Value Through Addition and Subtraction Within 20

OVERVIEW

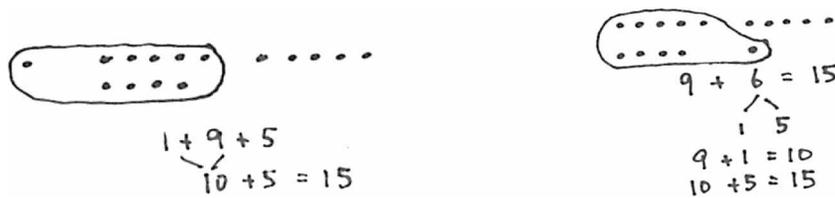
Module 2 serves as a bridge from problem solving within 10 to work within 100 as students begin to solve addition and subtraction problems involving teen numbers (**1.2A**, **1.2B**). In Module 1, students were encouraged to move beyond the strategy of counting all to the more efficient strategy of counting on. Now, they go even further beyond these strategies to learn decomposition and composition strategies, informally called “make ten” or “take from ten.”



Though many students may continue to count on as their primary means of adding and subtracting, the larger purpose of composing and decomposing ten is to lay the foundation for the role of place value units in addition and subtraction. Meanwhile, from the beginning of the year, fluency activities have focused on three prerequisite skills for the decomposition and composition methods:

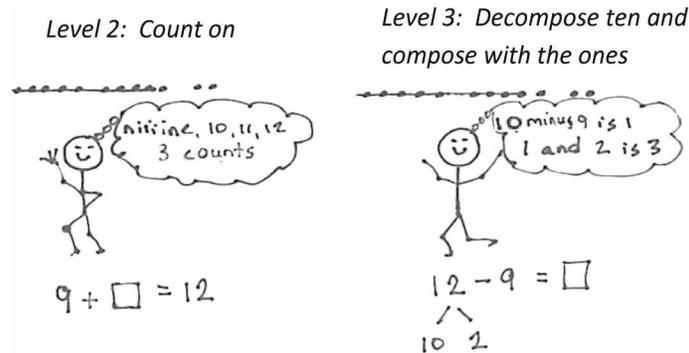
1. Partners to ten (**K.2I**).
2. Decompositions for all numbers within 10 (**K.2I**).
3. Representations of teen numbers as $10 + n$ (**K.2E**, **K.2F**, **1.2A**, **1.2B**). For example, students practice counting the Say Ten way (i.e., ten 1, ten 2, ...) from Kindergarten on.

To introduce students to the make ten strategy, in Topic A students solve problems with three addends (**1.3B**, **1.5D**, **1.5G**) and realize it is sometimes possible to use the associative and commutative properties to compose ten, e.g., “Maria made 1 snowball. Tony made 5, and their father made 9. How many snowballs did they make in all?” $1 + 5 + 9 = (9 + 1) + 5 = 10 + 5 = 15$. Since we can add in any order, we can pair the 1 with the 9 to make a ten first. Having seen how to use partners to ten to simplify addition, students next decompose a second addend in order to compose a ten from 9 or 8 (e.g., “Maria has 9 snowballs and Tony has 6. How many do they have in all?”). $9 + 6 = 9 + (1 + 5) = (9 + 1) + 5 = 10 + 5 = 15$ (**1.3C**, **1.3D**). Between the intensive work with addends of 8 and 9 is a lesson exploring commutativity so that students realize they can compose ten from the larger addend.



Throughout Topic A, students also count on to add. Students begin by modeling the situations with concrete materials, move to representations of 5-groups, and progress to modeling with number bonds. The representations and models make the connection between the two strategies clear. For example, using the 5-groups pictured above, students can simply count on from 9 to 15, tracking the number of counts on their fingers just as they did in Module 1. They repeatedly compare and contrast counting on with making ten, seeing that the latter is a convenient shortcut. Many start to make the important move from using the counting on strategy to using a “make ten” strategy, persuaded by confidence in their increasing skill and the joy of the shortcut. This is a critical step in building flexible part-whole thinking whereby students see numbers as parts and wholes rather than as discrete counts or one part and some ones. Five-groups soon begin to be thought of as ten-frames, focusing on the usefulness of trying to group 10 when possible. This empowers students in later modules and future grade levels to compose and decompose place value units and work adeptly with the four operations. For example, in Grade 1, this is applied in later modules to solve problems such as $18 + 6$, $27 + 9$, $36 + 6$, $49 + 7$ (**1.3C**, **1.3D**).

To introduce students to the take from ten strategy, Topic B opens with questions such as, “Mary has two plates of cookies, one with 10 and one with 2. At the party, 9 cookies were eaten from the plate with 10 cookies. How many cookies were left after the party?” $10 - 9 = 1$ and $1 + 2 = 3$. Students then reinterpret the story to see its solution can also be written as $12 - 9$.



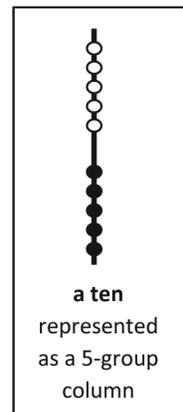
Students relate counting on and subtraction as pictured above. Notice the model is identical, but the thinking is very different.

S: To solve $12 - 9$, I count on from 9 to 12, niiiine, 10, 11, 12, three counts. → To solve $12 - 9$, I make 12 into 10 and 2 and subtract 9 from ten. $1 + 2 = 3$.

Students practice a pattern of action, take from ten and add the ones, as they face different contexts in word problems (e.g., “Maria has 12 snowballs. She threw 8 of them. How many does she have left?”). (**1.3C**, **1.3D**). This is important foundational work for decomposing in the context of subtraction problem solving in Grade 2 (e.g., “Hmmm. $32 - 17$, do I take 7 ones from 2 ones or from a ten?”). Grade 1 students begin using horizontal linear models of 5-groups or ten-frames to begin the transition toward a unit of ten, as shown in the above image.

Topic C presents students with opportunities to solve varied *add with change unknown*, *take from with change unknown*, *put together with addend unknown*, and *take apart with addend unknown* word problems. These situations give ample time for exploring strategies for finding an unknown. The module so far has focused on counting on and subtracting by decomposing and composing (**1.3B, 1.5D**). These lessons open up the possibilities to include other strategies like “take away in parts” (e.g., $12 - 3 = 12 - 2 - 1$). Teachers can include or adjust such strategy use dependent on whether they feel it enhances understanding or rather undermines or overwhelms. The topic closes with a lesson to further solidify student understanding of the equal sign as it has been applied throughout the module. Students match equivalent expressions to construct true number sentences and explain their reasoning using words, pictures, and numbers (e.g., $12 - 7 = 3 + 2$, $10 + 5 = 9 + 6$) (**1.5E**).

In Topic D, after all the work with 10, the module culminates with naming a ten (**1.2A, 1.2B**). Familiar representations of teen numbers, such as two 5-groups, the Rekenrek, and 10 fingers, are all renamed as a ten and some ones (**1.2A, 1.2B**), rather than 10 ones and some more ones (**K.2E, K.2F**). The ten is shifting to being one unit, a structure from which students can compose and decompose teen numbers (**1.2A, 1.2B**). This significant step forward sets the stage for understanding all the numbers within 100 as composed of a number of units of ten and some ones (**1.2A, 1.2B**). The horizontal linear 5-group modeling of 10 is moved to a vertical representation in preparation for this next stage, in Module 4, as shown in the image on the right. This topic’s work is done while solving both abstract equations and contextualized word problems.



Notes on Pacing for Differentiation

If pacing is a challenge, embed conversations about efficiency and strategy comparison throughout Module 2. Application Problems and Student Debriefs can provide opportunities to share and compare students' varied strategies. This allows omission of four lessons: 5, 9, 11, and 21. In Lesson 16, consider focusing on the finger work to practice the take from ten strategy rather than focusing on relating counting on to making ten and taking from ten. Consider omitting Lesson 24 if Application Problems are completed daily and if students have completed Lessons 22 and 23, which also focus on solving word problems. Note that it may be useful to extend Lessons 10, 19, 20, or 25 to provide extra practice as students develop their understanding of making ten, taking from ten, and the meaning of the equal sign.

Focus Grade Level Standards

Number and Operations

The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

- 1.2A** recognize instantly the quantity of structured arrangements;
- 1.2B** use objects, pictures, and expanded and standard forms to represent numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.

Number and Operations

The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:

- 1.3B** use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as $2 + 4 = []$; $3 + [] = 7$; and $5 = [] - 3$;
- 1.3C** compose 10 with two or more addends with and without concrete objects;
- 1.3D** apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10;
- 1.3E** explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences;
- 1.3F** generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20.

Algebraic Reasoning

The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:

- 1.5C** use relationships to determine the number that is 10 more and 10 less than a given number up to 120;
- 1.5D** represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences;
- 1.5E** understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s);



- 1.5F** determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation; and
- 1.5G** apply properties of operations to add and subtract two or three numbers.

Foundational Standards

The student is expected to:

- K.2I** compose and decompose numbers up to 10 with objects and pictures;
- K.2E** generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20;
- K.2F** generate a number that is one more than or one less than another number up to at least 20.

Focus Mathematical Process Standards

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

- MPS(D)** communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
- MPS(F)** analyze mathematical relationships to connect and communicate mathematical ideas.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS	Topics and Objectives	Days
1.3B 1.3C 1.3D 1.3E 1.3F 1.5D 1.5G	1.C 2.C 2.E 2.I 3.D 3.E 3.H 4.G 5.B	A Counting On or Making Ten to Solve <i>Result Unknown</i> and <i>Total Unknown</i> Problems Lesson 1: Solve word problems with three addends, two of which make ten. Lesson 2: Use the associative and commutative properties to make ten with three addends. Lessons 3–4: Make ten when one addend is 9. Lesson 5: Compare efficiency of counting on and making ten when one addend is 9. Lesson 6: Use the commutative property to make ten. Lessons 7–8: Make ten when one addend is 8. Lesson 9: Compare efficiency of counting on and making ten when one addend is 8. Lesson 10: Solve problems with addends of 7, 8, and 9. Lesson 11: Generate, solve, share, and critique peer solution strategies for <i>put together with total unknown</i> word problems.	11
		Mid-Module Assessment: Topic A (assessment 1 day, return 1 day, remediation or further applications 1 day)	3
1.3B 1.3D 1.3E 1.3F 1.5D 1.5G 1.3C 1.5E	1.H 2.C 2.G 2.I 3.E 3.H 4.B 4.G 5.B	B Counting On or Taking from Ten to Solve <i>Result Unknown</i> and <i>Total Unknown</i> Problems Lessons 12–13: Solve word problems with subtraction of 9 from 10. Lessons 14–15: Model subtraction of 9 from teen numbers. Generate story problems given a number sentence. Lesson 16: Relate counting on to making ten and taking from ten. Lessons 17–18: Model subtraction of 8 from teen numbers. Lesson 19: Compare efficiency of counting on and taking from ten. Lesson 20: Subtract 7, 8, and 9 from teen numbers. Lesson 21: Share and critique peer solution strategies for <i>take from with result unknown</i> and <i>take apart with addend unknown</i> word problems from the teens.	10



TEKS	ELPS	Topics and Objectives	Days
1.3B 1.3D 1.3E 1.3F 1.5D 1.5E 1.5G 1.5F	1.C 1.H 2.I 3.E 3.H 4.C 4.G 5.B	C Strategies for Solving <i>Change</i> or <i>Addend Unknown</i> Problems Lesson 22: Solve <i>put together/take apart with addend unknown</i> word problems, and relate counting on to the take from ten strategy. Generate story problems given a number sentence. Lesson 23: Solve <i>add to with change unknown</i> problems, relating varied addition and subtraction strategies. Lesson 24: Strategize to solve <i>take from with change unknown</i> problems. Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.	4
1.2A 1.2B 1.3B 1.3F 1.5D 1.3D 1.3E 1.5C 1.5G	1.A 1.C 2.E 2.I 3.H 4.C 4.G 5.B	D Varied Problems with Decompositions of Teen Numbers as 1 Ten and Some Ones Lesson 26: Identify 1 ten as a unit by renaming representations of 10. Lesson 27: Solve addition and subtraction problems decomposing and composing teen numbers as 1 ten and some ones. Lesson 28: Solve addition problems using ten as a unit, and write two-step solutions. Generate story problems given a number sentence. Lesson 29: Solve subtraction problems using ten as a unit, and write two-step solutions.	4
		End-of-Module Assessment: Topics A–D (assessment 1 day, return 1 day, remediation or further applications 1 day)	3
Total Number of Instructional Days			35

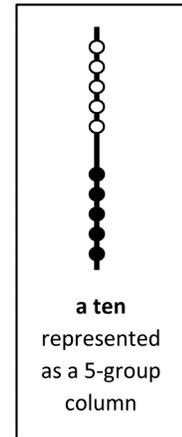
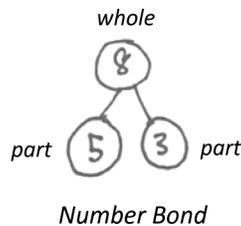
Terminology

New or Recently Introduced Terms

- A ten (a group, or unit, consisting of 10 items)
- Compose (a joining of parts to make a whole)
- Decompose (a separating of a whole into parts)
- Ones (individual units, 10 of which become a ten)
- Sum (a total amount resulting from the addition of two or more numbers)

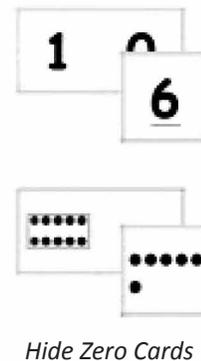
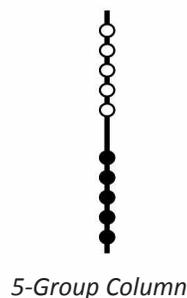
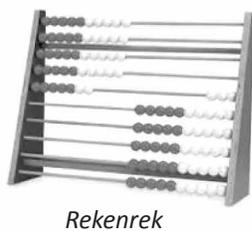
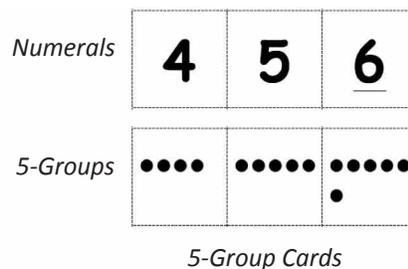
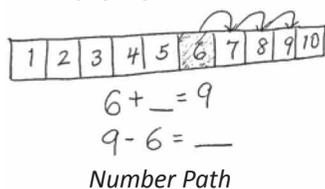
Familiar Terms and Symbols¹

- 5-groups
- Add
- Equals
- Number bonds
- Partners to ten
- Subtract
- Teen numbers



Suggested Tools and Representations

- 5-group formations: 5-groups (and 5-group cards), 5-group rows, 5-group column
- Hide Zero cards
- Number bonds
- Number path
- Rekenrek



¹These are terms and symbols students have seen previously.

Homework

Homework at the K–1 level is not a convention in all schools. In this curriculum, homework is an opportunity for additional practice of the content from the day’s lesson. The teacher is encouraged, with the support of parents, administrators, and colleagues, to discern the appropriate use of homework for his or her students. Fluency exercises can also be considered as an alternative homework assignment.

Scaffolds

The scaffolds integrated into *A Story of Units*® give alternatives for how students access information as well as express and demonstrate their learning. Strategically placed margin notes are provided within each lesson, elaborating on the use of specific scaffolds at applicable times. They address many needs presented by English language learners, students with disabilities, students performing above grade level, and students performing below grade level. Many of the suggestions are organized by Universal Design for Learning (UDL) principles and are applicable to more than one population.

Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic A	Constructed response with rubric	1.3B 1.3C 1.3D 1.3E 1.3F 1.5D 1.5G
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.2A 1.2B 1.3B 1.3C 1.3D 1.3E 1.3F 1.5D 1.5G

Throughout the module, students are given opportunities to generate and solve their own addition and subtraction problems when given a number sentence (**1.3F**). In order to support students’ first efforts at creating story problems, contexts for the stories are suggested throughout. Students will have opportunities to use original contexts in later modules.