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GRADE 1 • MODULE 1

Sums and Differences to 10

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OVERVIEW

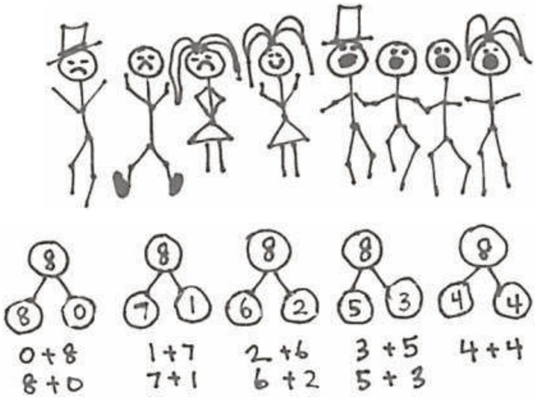
In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 (**1.3D**) as they are presented with opportunities intended to advance them from counting all to counting on, which leads many students then to decomposing and composing addends and total amounts. In Kindergarten, students achieved fluency with addition and subtraction facts to 5. This means they can decompose 5 into 4 and 1, 3 and 2, and 5 and 0. They can do this without counting all. They perceive the 3 and 2 embedded within the 5.

Topic A continues the work of developing this ability with all the numbers within 10 in *put together* situations (**1.3B, 1.5D**), with a special focus on the numbers 6, 7, 8, and 9, since recognizing how much a number needs to make 10 is easier for most children. Students decompose numbers into two sets, or conceptually subitize (**1.2A**), in Lessons 1 and 2, and record their decompositions as number bonds.

T: How many dots do you see?
S: 8.
T: What two parts do you see?
S: I see 5 and 3.
T: Did you need to count all the dots?
S: No! I could see the top row was a full five, so I just said 6, 7, 8.

In Lesson 3, students see and describe *1 more* as + 1. They use the structure of the first addend rather than its cardinality (**1.2A**), just as the student speaking in the above vignette used the five. The number is a unit to which they can add one, or count on by one, without recounting. All three lessons in Topic A prepare students to solve addition problems by counting on rather than counting all (**1.3D**).

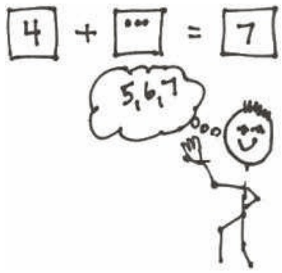
Topic B continues the process of having the students compose and decompose. They describe *put together* situations (pictured to the right) with number bonds and count on from the first part to totals of 6, 7, 8, 9, and 10 (**1.3B, 1.3D, 1.5D**). As they represent all the partners of a number, they reflect and see the decompositions, “Look at all these ways to make 8. I can see connections between them.”



Through dialogue, they engage in seeing both the composition invited by the *put together* situation and the decomposition invited by the number bonds. Expressions are another way to model both the stories and the bonds, the compositions and the decompositions (**1.3B, 1.5D**).

In Topic C, students interpret the meaning of addition from *adding to with result unknown* or *putting together with result unknown* story problems by drawing their own pictures and generating solution equations. Advancing beyond the Kindergarten word problem types, students next solve *add to with change unknown* problems such as, “Ben has 5 pencils. He got some more from his mother. Now, he has 9 pencils. How many pencils did Ben get from his mother?” These problems set the foundation early in the module for relating addition to subtraction in Topic G (**1.3D**).

In Topic D, students work outside the context of stories for three days to further their understanding of and skill with counting on using 5-group cards. The first addend is represented with a numeral card, symbolizing the structure to count on from. The number to be added is represented using the dot side of the 5-group card. Students count on from the first addend. They learn to replace counting the dots by tracking the count on their fingers to find the solution. In Lesson 16, they solve problems such as 4 + ___ = 7 by tracking the number of counts as they say, “5, 6, 7” (**1.5F**).

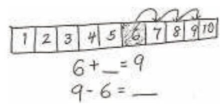


In Topic E, in the context of addition to 10, students expand their knowledge of two basic ideas of mathematics: equality and the commutativity of addition (**1.5E**). The lesson on the equal sign precedes the lessons on commutativity in order to allow students to later construct true number sentences such as 4 + 3 = 3 + 4 without misunderstanding the equal sign to mean that the numbers are the same. Students apply their new generalization about the position of the addends to count on from the larger number. For example, “I can count on 2 from 7 when I solve 2 + 7.”

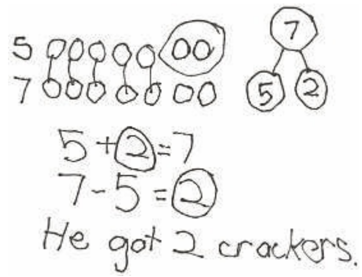
Like Topic E, Topic F leads students to make more generalizations that support their deepening understanding of addition within 10. They learn to recognize doubles and doubles plus 1. They analyze the addition chart for repeated reasoning and structures (such as 5-groups, plus ones, doubles, sums equal to 10, etc.) that can help them to better understand relationships and connections between different addition facts.

Following the Mid-Module Assessment, Topic G relates addition to subtraction. Since Module 4 in Kindergarten, students have been very familiar with subtraction as “take away.” During Fluency Practice in the lessons in Topics A through F, students have had opportunities to remember their Kindergarten work with subtraction. Therefore, Topic G starts immediately with the concept of subtraction as a missing addend, just as Grade 3 students learn division as a missing factor in a multiplication problem.

Having already worked with *add to with change unknown* problems earlier in the module, students revisit this familiar problem type, reinterpreting it as subtraction. The topic then uses the strategies of counting with both 5-group cards and the number path to solve subtraction problems (**1.3D**).



“Ben had 5 crackers. He got some more. Now he has 7. How many crackers did Ben get?”



Topic H is analogous to Topic C. Students interpret the meaning of subtraction as they solve different problem types involving subtraction (**1.3B, 1.5D**). Throughout Module 1, rather than using formal drawings or strip diagrams, students are encouraged to make math drawings that flow from their understanding of the stories. They engage in dialogue to relate their drawings to number sentences and explain the meaning of the subtraction symbol.

Topic I follows a week of intensive work with story problems to work on a more abstract level by visiting methods for subtraction involving special cases, subtracting 0 and 1, subtracting the whole number, and subtracting one less than the whole number. These two lessons are followed by three lessons in which students use familiar decompositions (5-groups and partners of 10) to conceptualize subtraction as finding a missing part (**1.3D, 1.3E, 1.3F, 1.5G**).

Finally, in Topic J, students analyze the addition chart for repeated reasoning and structures that support their journey towards fluency with subtraction within 10. The module closes with a lesson wherein students create sets of related addition and subtraction facts and use dialogue to explain their found connections (e.g., 7 = 4 + 3, 7 − 4 = 3, 4 + 3 = 3 + 4, 4 = 7 − 3, etc.). They began the module with very basic counting on and end the module both with the skill to count on and significant movement towards the goal of fluency, achieved as the second addend does not need to be counted or can be counted very quickly.

Please note that the assessments should be read aloud to Grade 1 students.

Notes on Pacing for Differentiation

Module 1

If pacing is a challenge, consider consolidating Lessons 22 and 23 into one lesson and omitting the Problem Sets. Instead, have students create their own flashcards for +0 and +1 facts for Lesson 22 and +2 facts for Lesson 23. Students can mix up their flashcards and order them (e.g., 2 columns for Lesson 22 and 3 columns for Lesson 23), thinking of the answers as they go, or they can quiz each other.

1 + 0	1 + 1	1 + 2
2 + 0	2 + 1	2 + 2
3 + 0	3 + 1	3 + 2
4 + 0	4 + 1	4 + 2
5 + 0	5 + 1	5 + 2
6 + 0	6 + 1	6 + 2
7 + 0	7 + 1	7 + 2
8 + 0	8 + 1	8 + 2
9 + 0	9 + 1	
10 + 0		

Consider consolidating Topics G and H by using the following sequence of lessons.

Day 1: Lesson 25—*Add to with change unknown* math stories related to subtraction.

Day 2: Lesson 30—*Add to with change unknown* math stories related to subtraction.

Day 3: Consolidate Lessons 28 and 29—*Take from* and *take apart* math stories.

Day 4: Lesson 31—*Take from with change unknown* math stories.

Day 5: Lesson 32—*Put together/take apart with addend unknown* math stories.

If the above sequence is used, teach Lessons 26 and 27 at the beginning of Topic I (Lessons 33–37) where the number path is used as a strategy for decomposition. These changes will provide time to focus on the concept of subtraction through word problems before the lessons on strategies for decomposition.

Consider omitting the Problem Sets from Lessons 38 and 39. Instead, have students create their own flashcards for related subtraction facts to be used in the same manner as the addition flashcards mentioned above.

Focus Grade Level Standards[1]

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.

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:

1.5D 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;

1.5G apply properties of operations to add and subtract two or three numbers.

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[1] In this module, work is limited to within 10.

Foundational Standards

The student is expected to:

K.2C count a set of objects up to at least 20 and demonstrate that the last number said tells the number of objects in the set regardless of their arrangement or order;

K.2F generate a number that is one more than or one less than another number up to at least 20;

K.2I compose and decompose numbers up to 10 with objects and pictures;

K.5 recite numbers up to at least 100 by ones and tens beginning with any given number.

Focus Mathematical Process Standards

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

MPS(E) create and use representations to organize, record, and communicate mathematical ideas;

MPS(F) analyze mathematical relationships to connect and communicate mathematical ideas.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS		Topics and Objectives	Days
1.2A **1.3B** **1.3D** **1.5D**	1.C 2.C 2.E 2.I 3.D 3.E 4.G 5.A	A	**Embedded Numbers and Decompositions** Lesson 1: Analyze and describe embedded numbers (to 10) using 5-groups and number bonds. Lesson 2: Reason about embedded numbers in varied configurations using number bonds. Lesson 3: See and describe numbers of objects using *1 more* within 5-group configurations.	3
1.3B **1.3D** **1.3E** **1.5D** **1.5G**	1.C 2.C 2.E 2.I 3.E 3.F 3.G 4.F 4.G	B	**Counting On from Embedded Numbers** Lessons 4–5: Represent *put together* situations with number bonds. Count on from one embedded number or part to totals of 6 and 7, and generate all addition expressions for each total. Lessons 6–7: Represent *put together* situations with number bonds. Count on from one embedded number or part to totals of 8 and 9, and generate all expressions for each total. Lesson 8: Represent all the number pairs of 10 as number bonds from a given scenario, and generate all expressions equal to 10.	5
1.3B **1.3D** **1.3E** **1.3F** **1.5D** **1.5G**	1.C 1.G 2.A 2.C 2.I 3.D 3.E 3.G 4.A 4.F 4.G 5.C 5.D	C	**Addition Word Problems** Lesson 9: Solve *add to with result unknown* and *put together with result unknown* math stories by drawing, writing equations, and making statements of the solution. Lesson 10: Solve *put together with result unknown* math stories by drawing and using 5-group cards. Lesson 11: Solve *add to with change unknown* math stories as a context for counting on by drawing, writing equations, and making statements of the solution. Lesson 12: Solve *add to with change unknown* math stories using 5-group cards. Lesson 13: Tell *put together with result unknown, add to with result unknown*, and *add to with change unknown* stories from equations.	5

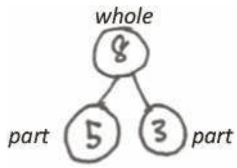
TEKS	ELPS		Topics and Objectives	Days
1.3D **1.5F** 1.3E 1.5G	1.C 2.E 2.I 3.B 3.E 4.C 4.G 5.B	D	**Strategies for Counting On** Lessons 14–15: Count on up to 3 more using numeral and 5-group cards and fingers to track the change. Lesson 16: Count on to find the unknown part in missing addend equations such as 6 + __ = 9. Answer, "How many more to make 6, 7, 8, 9, and 10?"	3
1.3D **1.5E**	1.C 1.E 2.E 2.I 3.C 3.E 4.G 5.B 5.C 5.E	E	**The Commutative Property of Addition and the Equal Sign** Lessons 17–18: Understand the meaning of the equal sign by pairing equivalent expressions and constructing true number sentences. Lesson 19: Represent the same story scenario with addends repositioned (the commutative property). Lesson 20: Apply the commutative property to count on from a larger addend.	4
1.3C **1.3D** **1.3E** **1.5G**	1.F 2.E 2.I 3.E 3.G 4.D 4.G 5.B	F	**Development of Addition Fluency Within 10** Lesson 21: Visualize and solve doubles and doubles plus 1 with 5-group cards. Lesson 22: Look for and make use of repeated reasoning on the addition chart by solving and analyzing problems with common addends. Lesson 23: Look for and make use of structure on the addition chart by looking for and coloring problems with the same total. Lesson 24: Practice to build fluency with facts to 10.	4
			Mid-Module Assessment: Topics A–F (assessment 1 day, return 1 day, remediation or further applications 1 day)	3
1.3B **1.3D** **1.5D**	1.C 2.I 3.C 3.E 3.H 4.D 4.G 5.B	G	**Subtraction as an Unknown Addend Problem** Lesson 25: Solve *add to with change unknown* math stories with addition, and relate to subtraction. Model with materials, and write corresponding number sentences. Lessons 26–27: Count on using the number path to find an unknown part.	3

TEKS	ELPS		Topics and Objectives	Days
1.3B **1.3D** **1.5D** 1.5F	1.A 1.C 2.E 2.G 2.I 3.E 3.F 4.G 5.B	H	**Subtraction Word Problems** Lesson 28: Solve *take from with result unknown* math stories with math drawings, true number sentences, and statements, using horizontal marks to cross off what is taken away. Lesson 29: Solve *take apart with addend unknown* math stories with math drawings, equations, and statements, circling the known part to find the unknown. Lesson 30: Solve *add to with change unknown* math stories with drawings, relating addition and subtraction. Lesson 31: Solve *take from with change unknown* math stories with drawings. Lesson 32: Solve *put together/take apart with addend unknown* math stories.	5
1.3D **1.3E** **1.5G**	1.C 1.F 2.I 3.B 3.E 3.F 3.H 4.G 5.B	I	**Decomposition Strategies for Subtraction** Lesson 33: Model 0 less and 1 less pictorially and as subtraction number sentences. Lesson 34: Model $n - n$ and $n - (n - 1)$ pictorially and as subtraction sentences. Lesson 35: Relate subtraction facts involving fives and doubles to corresponding decompositions. Lesson 36: Relate subtraction from 10 to corresponding decompositions. Lesson 37: Relate subtraction from 9 to corresponding decompositions.	5
1.3D **1.3E** **1.5G**	1.C 1.D 2.I 3.C 3.H 4.G 5.B 5.F	J	**Development of Subtraction Fluency Within 10** Lesson 38: Look for and make use of repeated reasoning and structure, using the addition chart to solve subtraction problems. Lesson 39: Analyze the addition chart to create sets of related addition and subtraction facts.	2
			End-of-Module Assessment: Topics A–J (assessment 1 day, return 1 day, remediation or further applications 1 day)	3
Total Number of Instructional Days				**45**

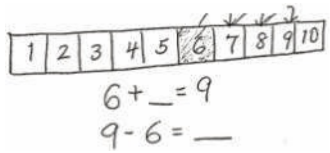
Terminology

New or Recently Introduced Terms

- Count on (count up from one addend to the total)
- Track (use different objects to track the count on from one addend to the total)
- Expression (e.g., 2 + 1 or 5 – 3)
- Addend (one of the numbers being added)
- Doubles (e.g., 3 + 3 or 4 + 4)
- Doubles plus 1 (e.g., 3 + 4 or 4 + 5)



Number Bond

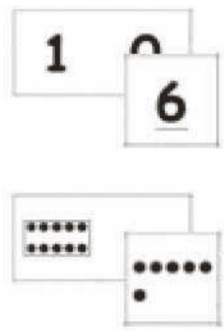


Number Path

Familiar Terms and Symbols[2]

- Part (e.g., "What is the unknown part? 3 + ___ = 8")
- Total and whole (use interchangeably instead of sum; e.g., "What is the total when we add 3 and 5?")
- Label (using letters or words on a math drawing to indicate the referents from the story's context)
- Addition, equal, and subtraction signs
- Equation and number sentence (used interchangeably throughout the module)
- Number bond (graphic showing part–part–whole)
- Equal sign (=)
- 5-groups (as pictured in the dot cards below), 2 rows of 5

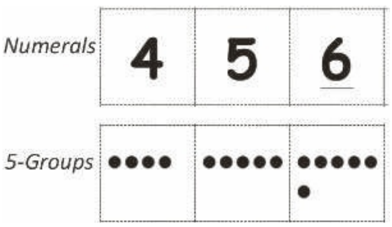
Rekenrek



Hide Zero Cards

Suggested Tools and Representations

- Number bonds
- Addition chart
- Rekenrek
- Counters
- Number path
- 5-Group cards
- Hide Zero cards



5-Group Cards

1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9
2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	
3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7		
4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6			
5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5				
6 + 0	6 + 1	6 + 2	6 + 3	6 + 4					
7 + 0	7 + 1	7 + 2	7 + 3						
8 + 0	8 + 1	8 + 2							
9 + 0	9 + 1								
10 + 0									

Addition Chart

[2] These are terms and symbols students have used or seen previously.

The Value of Sprints in *Eureka Math*®

Myth: The purpose of Sprints is to help students learn how to solve math problems quickly.

Reality: **Sprints offer concentrated fluency practice on specific skills and concepts.**

A well-managed and carefully timed routine is used in a Sprint to create an environment where students are fully engaged and focused on the activity[3]. Students are not expected to complete all of the problems and should not be assessed on their speed. Instead, Sprints are intentionally designed to provide students with opportunities to strive for and measure their improvement from one Sprint to the next within an engaging and motivating environment.

Myth: Sprints require students to rely on rote memorization or rote procedure.

Reality: **Sprints build understanding and flexible problem solving.**

Sprints support procedural fluency, a critical component of mathematical proficiency[4], by fostering conceptual understanding and flexible problem solving. The problems in each Sprint are carefully selected and sequenced to help students recognize patterns and structures to solve subsequent, more complex problems.

$12 = 4 \times$ _____

$12 = 2 \times 2 \times$ _____

$12 = 3 \times 2 \times$ _____

For example, consider the sequence of problems shown. The first problem contains an unknown factor. The second problem intentionally decomposes the known factor in the first problem, 4, into 2 × 2. The third problem is a variation of the second problem with one given factor changed. This type of sequence allows students to solve the problems by flexibly using factual recall, pattern recognition, and numeracy strategies.

Myth: Sprints introduce new learning in a lesson.

Reality: **Sprints distribute practice over time.**

Sprints distribute practice over time, which leads to better retention of learning[5]. The mathematics in the Sprint may be related to the lesson but it is not used to introduce new learning.

Myth: Sprints use problems that aren't appropriate for some students.

Reality: **Sprints let all students practice at the level appropriate for them.**

Sprints allow students to focus on their own growth and to strive for their personal best. The problems are intentionally designed to progress in difficulty from simple to complex, and students are not expected to complete all of the problems. Instead, each student does their personal best based on their current automaticity with a given concept or skill.

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[3] Sagher, Yoram and M. Vali Siadat. "Building Study Skills in a College Mathematics Classroom." Research report, Richard J. Daley College, 1997. Education Resources Information Center (ED449834). https://eric.ed.gov/?id=ED449834.

[4] National Council of Teachers of Mathematics (NCTM). "Procedural Fluency in Mathematics: A Position of the National Council of Teachers of Mathematics." Accessed April 8, 2021. https://www.nctm.org/Standards-and-Positions/Position-Statements/Procedural-Fluency-in-Mathematics/. 2014.

[5] Brown, Peter, Henry L. Roediger III, and Mark A. McDaniel. *Make It Stick: The Science of Successful Learning.* Cambridge, MA: Harvard University Press. 2014.

Myth: Sprints should be a graded activity.

Reality: **Sprints are practice and formative assessments.**

Sprints are practice. They are not summative assessments. Sprints allow students to see their improvement from one Sprint to the next and provide teachers with a sense of each student's automaticity with a particular concept or skill. We strongly discourage grading Sprints.

Suggested Methods of Instructional Delivery

Directions for Administration of Sprints

Sprints are designed to develop fluency. They should be fun, adrenaline-rich activities that intentionally build energy and excitement. A fast pace is essential. During Sprint administration, teachers assume the role of athletic coaches. A rousing routine fuels students' motivation to do their personal best. Student recognition of increasing success is critical, and so every improvement is celebrated.

One Sprint has two parts with closely related problems on each. Students complete the two parts of the Sprint in quick succession with the goal of improving on the second part, even if only by one more.

With practice, the following routine takes about 9 minutes.

Sprint A

Pass Sprint A out quickly, face down on student desks with instructions to not look at the problems until the signal is given. (Some Sprints include words. If necessary, prior to starting the Sprint, quickly review the words so that reading difficulty does not slow students down.)

T: You will have 60 seconds to do as many problems as you can. I do not expect you to finish all of them. Just do as many as you can, your personal best. (If some students are likely to finish before time is up, assign a number to count by on the back.)

T: Take your mark! Get set! THINK!

Students immediately turn papers over and work furiously to finish as many problems as they can in 60 seconds. Time precisely.

T: Stop! Circle the last problem you did. I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready?

T: (Energetically, rapid-fire call the first answer.)

S: Yes!

T: (Energetically, rapid-fire call the second answer.)

S: Yes!

Repeat to the end of Sprint A or until no student has a correct answer. If needed, read the count-by answers in the same way you read Sprint answers. Each number counted-by on the back is considered a correct answer.

T: Fantastic! Now, write the number you got correct at the top of your page. This is your personal goal for Sprint B.

T: How many of you got one right? (All hands should go up.)

T: Keep your hand up until I say the number that is one more than the number you got correct. So, if you got 14 correct, when I say 15, your hand goes down. Ready?

T: (Continue quickly.) How many got two correct? Three? Four? Five? (Continue until all hands are down.)

If the class needs more practice with Sprint A, continue with the optional routine presented below.

T: I'll give you one minute to do more problems on this half of the Sprint. If you finish, stand behind your chair.

As students work, the student who scored highest on Sprint A might pass out Sprint B.

T: Stop! I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready? (Read the answers to the first half again as students stand.)

Movement

To keep the energy and fun going, always do a stretch or a movement game in between Sprints A and B. For example, the class might do jumping jacks while skip-counting by 5 for about 1 minute. Feeling invigorated, students take their seats for Sprint B, ready to make every effort to complete more problems this time.

Sprint B

Pass Sprint B out quickly, face down on student desks with instructions to not look at the problems until the signal is given. (Repeat the procedure for Sprint A up through the show of hands for how many right.)

T: Stand up if you got more correct on the second Sprint than on the first.

S: (Stand.)

T: Keep standing until I say the number that tells how many more you got right on Sprint B. If you got three more right on Sprint B than you did on Sprint A, when I say *three*, you sit down. Ready? (Call out numbers starting with one. Students sit as the number by which they improved is called. Celebrate the students who improved most with a cheer.)

T: Well done! Now, take a moment to go back and correct your mistakes. Think about what patterns you noticed in today's Sprint.

T: How did the patterns help you get better at solving the problems?

T: Rally Robin your thinking with your partner for 1 minute. Go!

Rally Robin is a style of sharing in which partners trade information back and forth, one statement at a time per person, for about 1 minute. This is an especially valuable part of the routine for students who benefit from their friends' support to identify patterns and try new strategies.

Students may take Sprints home.

Personal White Boards

Materials Needed for Personal White Boards

1 heavy duty clear sheet protector
1 piece of stiff red tag board 11" × 8 ¼"
1 piece of stiff white tag board 11" × 8 ¼"
1 3" × 3" piece of dark synthetic cloth for an eraser (e.g., felt)
1 low odor blue dry erase marker, fine point

Directions for Creating Personal White Boards

Cut your white and red tag to specifications. Slide into the sheet protector. Store your eraser on the red side. Store markers in a separate container to avoid stretching the sheet protector.

Frequently Asked Questions About Personal White Boards

Why is one side red and one white?

- The white side of the board is the "paper." Students generally write on it, and if working individually, turn the board over to signal to the teacher that they have completed their work. The teacher then says, "Show me your boards," when most of the class is ready.

What are some of the benefits of a personal white board?

- The teacher can respond quickly to a gap in student understandings and skills. "Let's do some of these on our personal white boards until we have more mastery."
- Students can erase quickly so that they do not have to suffer the evidence of their mistake.
- They are motivating. Students love both the drill and thrill capability and the chance to do story problems with an engaging medium.
- Checking work gives the teacher instant feedback about student understanding.

What is the benefit of this personal white board over a commercially purchased dry erase board?

- It is much less expensive.
- Templates such as place value charts, number bond mats, hundreds boards, and number lines can be stored between the two pieces of tag board for easy access and reuse.
- Worksheets, story problems, and other problem sets can be done without marking the paper so that students can work on the problems independently at another time.
- Strips with story problems, number lines, and arrays can be inserted and still have a full piece of paper on which to write.
- The red versus white side distinction clarifies your expectations. When working collaboratively, there is no need to use the red side. When working independently, the students know how to keep their work private.
- The tag board can be removed if necessary to project the work.

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. To read more about the approach to differentiated instruction in *A Story of Units*, please refer to "How to Implement *A Story of Units*."

Self-Reflections

Directions for Using Student Self-Reflections

Giving students an opportunity to think and talk about their learning process and progress empowers them to take responsibility for their knowledge development. Self-reflections can be implemented at the end of every topic to encourage students to track their strategies and understanding of key concepts as they progress through the module. Students can refer to their completed Exit Tickets from each lesson within a topic as they reflect upon their learning of these concepts. In their reflections, students should evaluate the outcomes of their learning by writing about the concepts they feel secure with and those that will require more attention and focus. Students will use this knowledge to make actionable plans for improvement with the support of their teacher.

As students reflect on their learning within each topic, they can review previous reflections and discuss how their understanding has changed over time. Students can also use all of their reflections to analyze their overall learning experience for the entire module.

A self-reflection template is provided on the following page. The template is appropriate for use with students at all grade levels. Students can answer the questions on the template by using pictures, numbers, or words. Self-reflections are intended to be easily integrated into existing data-tracking structures used by teachers and students. The reflections can also be used to facilitate communication about a student's progress with the student's family.

Name ______________________________ Date ______________

Module __________ Topic __________

I learned:

5 I understand.

4

3

2

1 I need help.

Next steps:

I still have questions about:

Preparing to Teach a Module

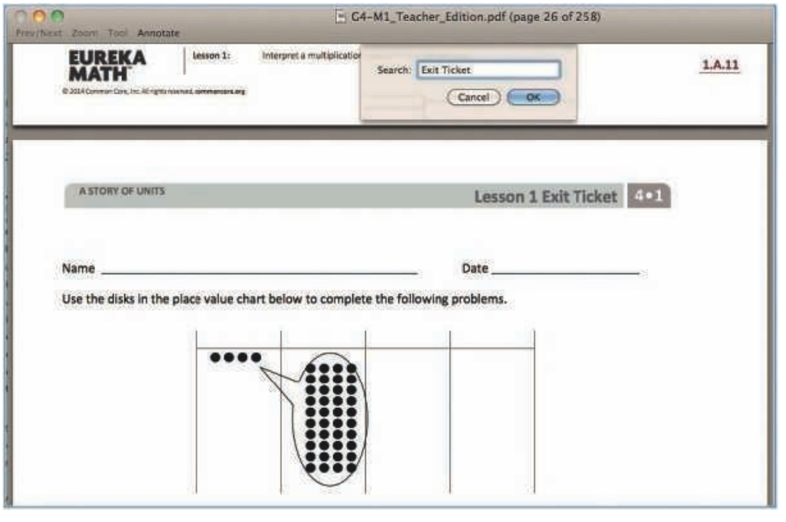
Preparation of lessons will be more effective and efficient if there has been an adequate analysis of the module first. Each module in *A Story of Units* can be compared to a chapter in a book. How is the module moving the plot, the mathematics, forward? What new learning is taking place? How are the topics and objectives building on one another? The following is a suggested process for preparing to teach a module.

Step 1: Get a preview of the plot.

A: Read the Table of Contents. At a high level, what is the plot of the module? How does the story develop across the topics?

B: Preview the module's Exit Tickets[6] to see the trajectory of the module's mathematics and the nature of the work students are expected to be able to do.

Note: When studying a PDF file, enter "Exit Ticket" into the search feature to navigate from one Exit Ticket to the next.



Step 2: Dig into the details.

A: Dig into a careful reading of the Module Overview. While reading the narrative, *liberally* reference the lessons and Topic Overviews to clarify the meaning of the text—the lessons demonstrate the strategies, show how to use the models, clarify vocabulary, and build understanding of concepts. Consider searching the video gallery on *Eureka Math's* website to watch demonstrations of the use of models and other teaching techniques.

B: Having thoroughly investigated the Module Overview, read through the chart entitled Overview of Module Topics and Lesson Objectives to further discern the plot of the module. How do the topics flow and tell a coherent story? How do the objectives move from simple to complex?

[6] A more in-depth preview can be done by searching the Problem Sets rather than the Exit Tickets. Furthermore, this same process can be used to preview the coherence or flow of any component of the curriculum, such as Fluency Practice or Application Problems.

Step 3: Summarize the story.

Complete the Mid- and End-of-Module Assessments. Use the strategies and models presented in the module to explain the thinking involved. Again, liberally reference the work done in the lessons to see how students who are learning with the curriculum might respond.

Preparing to Teach a Lesson

A three-step process is suggested to prepare a lesson. It is understood that at times teachers may need to make adjustments (customizations) to lessons to fit the time constraints and unique needs of their students. The recommended planning process is outlined below. Note: The ladder of Step 2 is a metaphor for the teaching sequence. The sequence can be seen not only at the macro level in the role that this lesson plays in the overall story, but also at the lesson level, where each rung in the ladder represents the next step in understanding or the next skill needed to reach the objective. To reach the objective, or the top of the ladder, all students must be able to access the first rung and each successive rung.

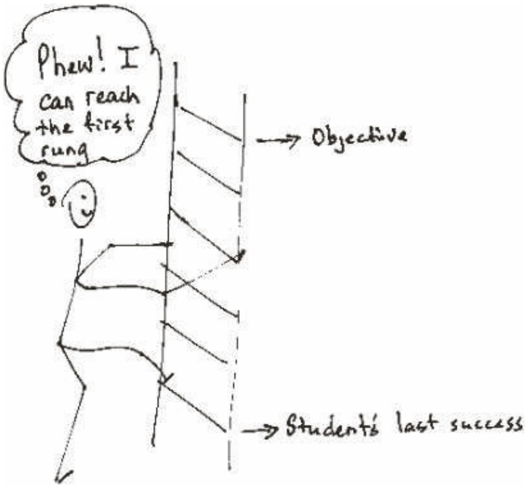
Step 1: Discern the plot.

A: Briefly review the Table of Contents for the module, recalling the overall story of the module and analyzing the role of this lesson in the module.

B: Read the Topic Overview of the lesson, and then review the Problem Set and Exit Ticket of each lesson of the topic.

C: Review the assessment following the topic, keeping in mind that assessments can be found midway through the module and at the end of the module.

Step 2: Find the ladder.



A: Complete the lesson's Problem Set.

B: Analyze and write notes on the new complexities of each problem as well as the sequences and progressions throughout problems (e.g., pictorial to abstract, smaller to larger numbers, single- to multi-step problems). The new complexities are the rungs of the ladder.

C: Anticipate where students might struggle, and write a note about the potential cause of the struggle.

D: Answer the Student Debrief questions, always anticipating how students will respond.

Step 3: Hone the lesson.

At times, the lesson and Problem Set are appropriate for all students and the day's schedule. At others, they may need customizing. If the decision is to customize based on either the needs of students or scheduling constraints, a suggestion is to decide upon and designate "Must Do" and "Could Do" problems.

A: Select "Must Do" problems from the Problem Set that meet the objective and provide a coherent experience for students; reference the ladder. The expectation is that the majority of the class will complete the "Must Do" problems within the allocated time. While choosing the "Must Do" problems, keep in mind the need for a balance of calculations, various word problem types, and work at both the pictorial and abstract levels.

B: "Must Do" problems might also include remedial work as necessary for the whole class, a small group, or individual students. Depending on anticipated difficulties, those problems might take different forms as shown in the chart below.

Anticipated Difficulty	"Must Do" Remedial Problem Suggestion
The first problem of the Problem Set is too challenging.	Write a short sequence of problems on the board that provides a ladder to Problem 1. Direct the class or small group to complete those first problems to empower them to begin the Problem Set. Consider labeling these problems "Zero Problems" since they are done prior to Problem 1.
There is too big of a jump in complexity between two problems.	Provide a problem or set of problems that creates a bridge between the two problems. Label them with the number of the problem they follow. For example, if the challenging jump is between Problems 2 and 3, consider labeling these problems "Extra 2s."
Students lack fluency or foundational skills necessary for the lesson.	Before beginning the Problem Set, do a quick, engaging fluency exercise, such as a Rapid White Board Exchange, "Thrilling Drill," or Sprint. Before beginning any fluency activity for the first time, assess that students are poised for success with the easiest problem in the set.
More work is needed at the concrete or pictorial level.	Provide manipulatives or the opportunity to draw solution strategies. Especially in Kindergarten, at times the Problem Set or pencil and paper aspect might be completely excluded, allowing students to simply work with materials.
More work is needed at the abstract level.	Hone the Problem Set to reduce the amount of drawing as appropriate for certain students or the whole class.

C: "Could Do" problems are for students who work with greater fluency and understanding and can, therefore, complete more work within a given time frame. Adjust the Exit Ticket and Homework to reflect the "Must Do" problems or to address scheduling constraints.

D: At times, a particularly tricky problem might be designated as a "Challenge!" problem. This can be motivating, especially for advanced students. Consider creating the opportunity for students to share their "Challenge!" solutions with the class at a weekly session or on video.

E: Consider how to best use the vignettes of the Concept Development section of the lesson. Read through the vignettes, and highlight selected parts to be included in the delivery of instruction so that students can be independently successful on the assigned task.

F: Pay close attention to the questions chosen for the Student Debrief. Regularly ask students, "What was the lesson's learning goal today?" Hone the goal with them.

Assessment Summary

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

Table of Contents

GRADE 1 • MODULE 2

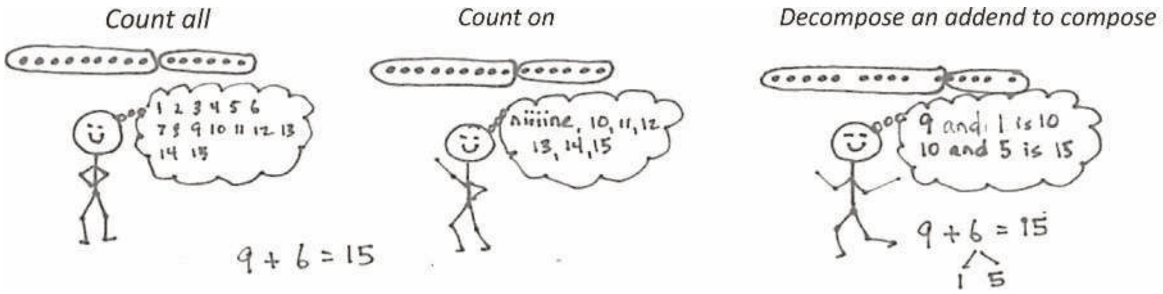
Introduction to Place Value Through Addition and Subtraction Within 20

Grade 1 • Module 2

Introduction to Place Value Through Addition and Subtraction Within 20

OVERVIEW

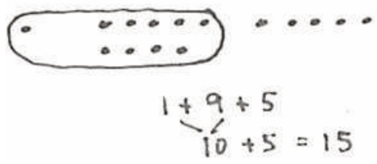
Module 2 serves as a bridge from problem solving within 10 to work within 100 as students begin to solve addition and subtraction problems involving teen numbers (**1.2A, 1.2B**). In Module 1, students were encouraged to move beyond the strategy of counting all to the more efficient strategy of counting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

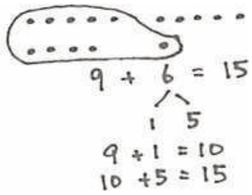


Though many students may continue to count on as their primary means of adding and subtracting, the larger purpose of composing and decomposing ten is to lay the foundation for the role of place value units in addition and subtraction. Meanwhile, from the beginning of the year, fluency activities have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

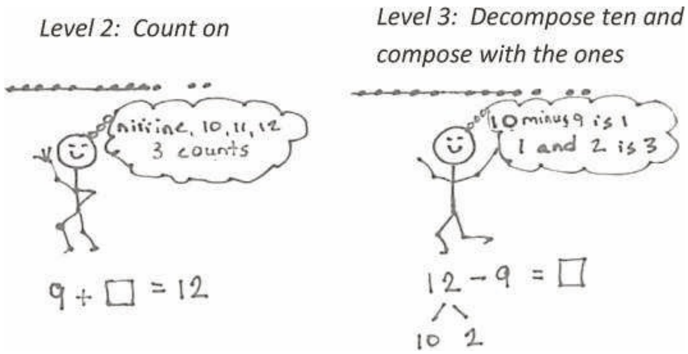
To introduce students to the make ten strategy, in Topic A students solve problems with three addends (**1.3B, 1.5D, 1.5G**) and realize it is sometimes possible to use the associative and commutative properties to compose ten, e.g., “Maria made 1 snowball. Tony made 5, and their father made 9. How many 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 to 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.

a ten represented as a 5-group column

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 concrete and pictorial models to compose and decompose 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:

- **1.5D** 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;
- **1.5G** apply properties of operations to add and subtract two or three numbers.

Foundational Standards

The student is expected to:

- **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;
- **K.2I** compose and decompose numbers up to 10 with objects and pictures.

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** 1.2A 1.2B 1.2C	1.C 2.C 2.E 2.I 3.D 3.E 3.H 4.A 4.G 5.B	A	**Counting On or Making Ten to Solve *Result Unknown* and *Total Unknown* 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 *put together with total unknown* 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.A 4.B 4.G 5.B	B	**Counting On or Taking from Ten to Solve *Result Unknown* and *Total Unknown* 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 *take from with result unknown* and *take apart with addend unknown* word problems from the teens.	10

<table>
<tr><th>TEKS</th><th>ELPS</th><th colspan="2">Topics and Objectives</th><th>Days</th></tr>
<tr><td>1.3B
1.3D
1.3E
1.3F
1.5D
1.5E
1.5F
1.5G</td><td>1.C
1.H
2.I
3.E
3.H
4.A
4.C
4.G
5.B</td><td>C</td><td>Strategies for Solving Change or Addend Unknown Problems
Lesson 22: Solve put together/take apart with addend unknown word problems, and relate counting on to the take from ten strategy. Generate story problems given a number sentence.
Lesson 23: Solve add to with change unknown problems, relating varied addition and subtraction strategies.
Lesson 24: Strategize to solve take from with change unknown problems.
Lesson 25: Strategize and apply understanding of the equal sign to solve equivalent expressions.</td><td>4</td></tr>
<tr><td>1.2A
1.2B
1.3B
1.3F
1.5D
1.3D
1.3E
1.5C
1.5G</td><td>1.A
1.C
2.E
2.I
3.H
4.A
4.C
4.G
5.B</td><td>D</td><td>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.</td><td>4</td></tr>
<tr><td></td><td></td><td></td><td>End-of-Module Assessment: Topics A–D (assessment 1 day, return 1 day, remediation or further applications 1 day)</td><td>3</td></tr>
<tr><td colspan="4">Total Number of Instructional Days</td><td>35</td></tr>
</table>

Terminology

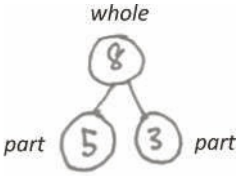
New or Recently Introduced Terms

- 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)

a ten represented as a 5-group column

Familiar Terms and Symbols[1]

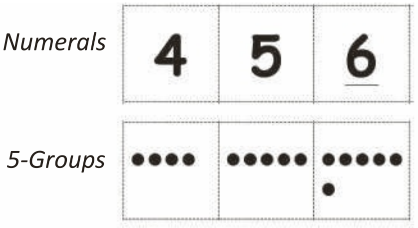
- 5-groups
- Add
- Equals
- Number bonds
- Partners to ten
- Subtract
- Teen numbers



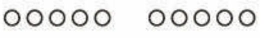
Number Bond

Suggested Tools and Representations

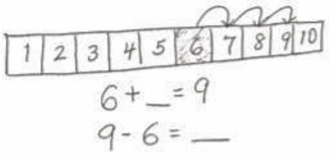
- 5-group formations: 5-groups (and 5-group cards), 5-group rows, 5-group column
- Hide Zero cards
- Number bonds
- Number path
- Rekenrek



5-Group Cards



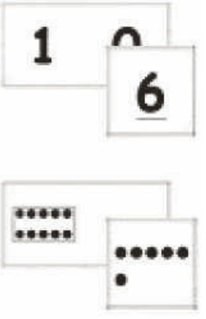
5-Group Rows



Number Path

Rekenrek

5-Group Column



Hide Zero Cards

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[1]These are terms and symbols students have seen previously.

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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 1.5E 1.5F 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.

Table of Contents

GRADE 1 • MODULE 3

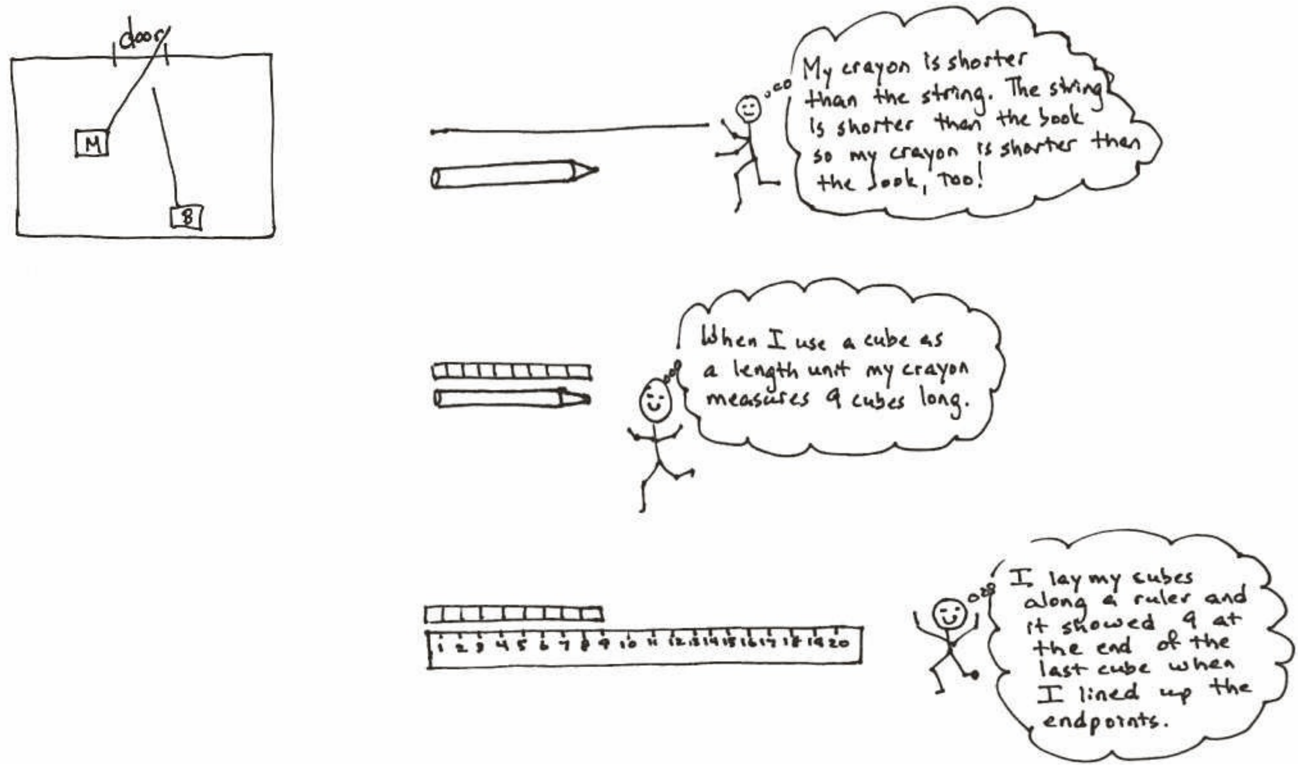
Ordering and Comparing Length Measurements as Numbers

Grade 1 • Module 3

Ordering and Comparing Length Measurements as Numbers

OVERVIEW

Grade 1 Module 3 opens in Topic A by extending students' Kindergarten experiences with direct length comparison to the new learning of indirect comparison whereby the length of one object is used to compare the lengths of two other objects (**1.7A**). "My string is longer than your book. Your book is longer than my pencil. That means my string is longer than my pencil!" Students use the same transitivity, or indirect comparison, to compare short distances within the classroom in order to find the shortest path to their classroom door, which is helpful to know for lining up and for emergencies. Students place one endpoint of a length of string at their desks and then extend the string toward the door to see if it will reach. After using the same piece of string from two students' desks, they make statements such as, "Maya's path is shorter than the string. Bailey's path is longer than the string. That means Bailey's path to the door is longer than Maya's path."



Topic B takes *longer than* and *shorter than* to a new level of precision by introducing the idea of a *length unit*. Centimeter cubes are laid alongside the length of an object as students learn that the total number of cubes laid end to end with no gaps or overlaps represents the length of that object (**1.7A, 1.7B, 1.7C, 1.7D**). The Geometric Measurement Progressions Document expresses the research indicating the importance of teaching standard units to Grade 1 students *before* non-standard units. Thus, Grade 1 students learn about the centimeter before exploring non-standard units of measurement in this module. Simply lining the cubes up to the ruler allows students to see that they are using units, which relate to a tool used around the world. One of the primary reasons why we recognize standard units is because they are ubiquitous, used on rulers at Grandma's house in Beaumont, in school, and in local shops. Students ask and answer the question, "Why would we use a standard unit to measure?" The topic closes with students measuring and comparing sets of three items using centimeter cubes. They return to the statements of Topic A, but now with more sophisticated insights, such as "The pencil measures 10 centimeters. The crayon measures 6 centimeters. The book measures 20 centimeters. I can put them in order from shortest to longest: the crayon, the pencil, the book. The book is longer than the pencil, and the pencil is longer than the crayon, so the book is longer than the crayon" (**1.7A**).

Topic C explores the usefulness of measuring with similar units. Students measure the same objects from Topic B using two different non-standard units, toothpicks and small paper clips, simultaneously to measure one object and answer the question, "Why do we measure with same-sized length units?" (**1.7A, 1.7B, 1.7C, 1.7D**). They realize that using iterations of the *same* unit will yield consistent measurement results. Similarly, students explore what it means to use a different unit of measurement from their classmates. It becomes obvious to students that if we want to have discussions about the lengths of objects, we *must* measure with the same units. Students answer the question, "If Bailey uses paper clips and Maya uses toothpicks, and they both measure things in our classroom, will they be able to compare their measurements?" With this new understanding of consistent measurement, Topic C closes with students solving *compare with difference unknown* problems. Students use standard units to answer such questions as, "How much longer is the pencil than the marker?" (**1.3B, 1.5D**).

Topic D closes the module as students represent and interpret data (**1.8A, 1.8B, 1.8C**). They collect data about their classmates and sort that information into three categories. Using same-sized pictures on squares, students represent this sorted data so that it can be easily compared and described. Students interpret information presented in the graphs by first determining the number of data points in a given category, for example, "How many students like carrots the best?" Then, students combine categories, for example, "How many total students like carrots or broccoli the best?" The module closes with students asking and answering varied questions about data sets, such as "How many students were polled in all?" (*put together with result unknown*) and "How many more students preferred broccoli to string beans?" (*compare with difference unknown*) (**1.3B, 1.5D**). Their work with units representing data points is an application of students' earlier work with length as they observe that each square can be lightly interpreted as a length unit, which helps them analyze the data.

Notes on Pacing for Differentiation

Students need Module 3's fluency before advancing to Module 4. In the event that there are critical pacing issues, consider moving Topic D (Lessons 10–13, focusing on graphing and data interpretation) to another time in the day (e.g., science, morning routine).

Note that Lessons 2, 4, 6, and 9 are the most essential lessons of Module 3.

Focus Grade Level Standards

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.

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:

1.5D represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences.

Geometry and Measurement

The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

1.7A use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement;

1.7B illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other;

1.7C measure the same object/distance with units of two different lengths and describe how and why the measurements differ;

1.7D describe a length to the nearest whole unit using a number and a unit.

Data Anaylsis

The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to: The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:

1.8A collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts;

1.8B use data to create picture and bar-type graphs;

1.8C draw conclusions and generate and answer questions using information from picture and bar-type graphs.

Foundational Standards

The student is expected to:

K.2D recognize instantly the quantity of a small group of objects in organized and random arrangements;

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.2G compare sets of objects up to at least 20 in each set using comparative language;

K.2H use comparative language to describe two numbers up to 20 presented as written numerals;

K.7A give an example of a measurable attribute of a given object, including length, capacity, and weight;

K.7B compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference.

Focus Mathematical Process Standards

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

MPS(E) create and use representations to organize, record, and communicate mathematical ideas;

MPS(F) analyze mathematical relationships to connect and communicate mathematical ideas;

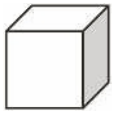
MPS(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS		Topics and Objectives	Days
1.7A	1.C 1.F 2.E 2.I 3.D 4.G 5.B	A	**Indirect Comparison in Length Measurement** Lesson 1: Compare length directly and consider the importance of aligning endpoints. Lesson 2: Compare length using indirect comparison by finding objects *longer than, shorter than,* and *equal in length to* that of a string. Lesson 3: Order three lengths using indirect comparison.	3
1.7A **1.7B** **1.7C** **1.7D**	1.C 2.E 2.I 3.E 3.G 4.F 4.G 5.B	B	**Standard Length Units** Lesson 4: Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps. Lesson 5: Rename and measure with centimeter cubes, using their standard unit name of centimeters. Lesson 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems.	3
1.3B **1.5D** **1.7A** **1.7B** **1.7C** **1.7D**	1.H 2.C 2.E 2.I 3.E 3.H 4.B 4.G 5.B	C	**Non-Standard and Standard Length Units** Lesson 7: Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit. Lesson 8: Understand the need to use the same units when comparing measurements with others. Lesson 9: Answer *compare with difference unknown* problems about lengths of two different objects measured in centimeters.	3
1.3B **1.5D** **1.8A** **1.8B** **1.8C**	1.A 1.H 2.E 2.F 3.F 4.G 5.B	D	**Data Interpretation** Lessons 10–11: Collect, sort, and organize data; then ask and answer questions about the number of data points. Lessons 12–13: Ask and answer varied word problem types about a data set with three categories.	4
			End-of-Module Assessment: Topics A–D (assessment ½ day, return ½ day, remediation or further applications 1 day)	2
Total Number of Instructional Days				**15**

Terminology

New or Recently Introduced Terms



- Centimeter (standard length unit within the metric system)
- Centimeter cube (pictured to the right, also used as a length unit in this module)
- Centimeter ruler (measurement tool using length units of centimeters)
- Data (collected information)
- Endpoint (the end of an object, referenced when aligning for measurement purposes)
- Height (measurement of vertical distance of an object)
- Length unit (measuring the length of an object with equal-sized units)
- Poll (survey)
- Table or graph (organized charts visually representing data)

Familiar Terms and Symbols[1]

- Less than
- Longer than/taller than
- More than
- Shorter than
- Tally marks

Suggested Tools and Representations

- Centimeter cubes
- Centimeter rulers (simply for the purpose of naming the centimeter)
- Non-standard units (toothpicks, small and large paper clips)
- String lengths of about 25 centimeters
- Tally marks

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.

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[1] These are terms and symbols students have seen previously.

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
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.3B 1.5D 1.7A 1.7B 1.7C 1.7D 1.8A 1.8B 1.8C

Topic A

Indirect Comparison in Length Measurement

1.7A

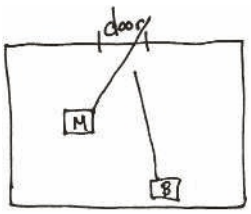
Focus Standard:		1.7A	Use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement .
Instructional Days:		3	
Coherence	**-Links from:**	GK–M3	Comparison of Length, Weight, Capacity, and Numbers to 10
	-Links to:	G2–M2	Addition and Subtraction of Length Units
		G2–M7	Problem Solving with Length, Money, and Data

The module opens in Topic A by extending students' Kindergarten experiences with direct length measurement to indirect measurement whereby the length of one object is used to compare that of two other objects (**1.7A**).

Students explore direct comparison in Lesson 1, comparing the length of two objects by paying close attention to the endpoints of each to ensure accurate comparisons. Students draw on their Kindergarten experiences as they use *longer than* and *shorter than* as they compare.

In Lesson 2, students begin to use indirect comparison (or transitivity) as they compare each item to one consistent item, such as a piece of string or a strip of construction paper of a specific length. Items are then compared to each other through indirect comparison. For instance, if the crayon is shorter than the paper strip, and the pencil is longer than the paper strip, we can say that the crayon is also shorter than the pencil. As a way to prove their conclusions from indirect comparisons, students use direct comparison to verify their claims.

Lesson 3 extends the use of indirect comparison to compare distances between objects that cannot be moved next to each other for direct comparison. Students use the same transitive process to compare short distances within the classroom in order to find the shortest path to their classroom door, which is helpful to know for lining up and for emergencies. After measuring each path from their desks to the door with the same piece of string, students are able to make statements, such as "Maya's path is shorter than the string. Bailey's path is longer than the string. That means Bailey's path to the door is longer than Maya's path." Using grid lines on classroom floor tiles and on provided maps of city blocks, students compare distances of various paths.



A Teaching Sequence Toward Mastery of Indirect Comparison in Length Measurement	
Objective 1:	**Compare length directly and consider the importance of aligning endpoints.** **(Lesson 1)**
Objective 2:	**Compare length using indirect comparison by finding objects *longer than, shorter than,* and *equal in length to* that of a string.** **(Lesson 2)**
Objective 3:	**Order three lengths using indirect comparison.** **(Lesson 3)**

Table of Contents

GRADE 1 • MODULE 4

Place Value, Comparison, Addition and Subtraction to 40

Grade 1 • Module 4

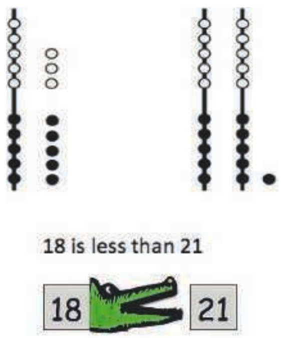
Place Value, Comparison, Addition and Subtraction to 40

OVERVIEW

Module 4 builds upon Module 2's work with place value within 20, now focusing on the role of place value in the addition and subtraction of numbers to 40.

The module opens with Topic A, where students study, organize, and manipulate numbers within 40. Having worked with creating a ten and some ones in Module 2, students now recognize multiple tens and ones. Students use fingers, linking cubes, dimes, and pennies to represent numbers to 40 in various ways—from all ones to tens and ones (**1.2A, 1.2B**). They use a place value chart to organize units. The topic closes with the identification of 1 more, 1 less, 10 more, and 10 less as students learn to add or subtract *like* units (**1.5C**).

In Topic B, students compare quantities and begin using the symbols for *greater than* (>) and *less than* (<) (**1.2E, 1.2F, 1.2G**). Students demonstrate their understanding of place value when they recognize that 18 is less than 21 since 2 tens already have a greater value than 1 ten 8 ones. To support understanding, the first lesson in the topic focuses on identifying the greater or lesser amount. With this understanding, students label each of the quantities being compared and compare from left to right. Finally, students are introduced to the mathematical symbols using the story of the alligator whose hungry mouth always opens toward the greater number. The abstract symbols are introduced after the conceptual foundation has been laid.



Topic C focuses on addition and subtraction of tens (**1.3A, 1.3D**). Having used concrete models in Topic A to represent 10 more and 10 less, students now recognize that just as 3 + 1 = 4, 3 tens + 1 ten = 4 tens. With this understanding, students add and subtract a multiple of 10 from another multiple of 10. The topic closes with the addition of multiples of 10 to numbers less than 40 (e.g., 12 + 30). While the TEKS for Grade 1 does not explicitly call for students to add multiples of 10, the use of unit form makes this content accessible. Furthermore, the use of unit form reinforces not only application of basic fact strategies (**1.3D**), but also helps to support students in joining sets of objects within 20 (**1.3B**) as ten sticks are counted.

In Topic D, students use familiar strategies to add two-digit and single-digit numbers within 40. Students apply the strategy of counting on and use the strategy of making ten, this time making *the next ten* (**1.3A**). For instance, when adding 28 + 5, students break 5 into 2 and 3 so that 28 and 2 can make *the next ten,* which is 30, or 3 tens, and then add 3 to make 33. The topic closes with students sharing and critiquing peer strategies.

In Topic E, students consider new ways to represent larger quantities when approaching *put together/take apart with total or addend unknown* and *add to with result or change unknown* word problems. Students begin labeling drawings with numerals and eventually move to strip diagrams to represent the problems pictorially (**1.3B, 1.5D**). Throughout this topic, students continue developing their skills with adding single-digit and double-digit numbers (introduced in Topic D) during fluency activities.

The module closes with Topic F, focusing on adding like place value units as students add two-digit numbers. The topic begins with interpreting two-digit numbers in varied combinations of tens and ones (e.g., 34 = 34 ones = 3 tens 4 ones = 2 tens 14 ones = 1 ten 24 ones). This flexibility in representing a given number prepares students for addition with regrouping (e.g., 12 + 8 = 1 ten 10 ones = 2 tens or 18 + 16 = 2 tens 14 ones = 3 tens 4 ones). To close the module, students add pairs of numbers with varied sums in the ones place to support flexibility in thinking and generate and solve word problems (**1.3F**).

Notes on Pacing for Differentiation

Lessons 11-12 may be omitted as they go beyond TEKS requirements for Grade 1. All other lessons are foundational for Grade 1 Number and Operations standards.

Focus Grade Level Standards

Number and Operations[1 2]

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 concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones;
- **1.2C** use objects, pictures, and expanded and standard forms to represent numbers up to 120;
- **1.2D** generate a number that is greater than or less than a given whole number up to 120;
- **1.2E** use place value to compare whole numbers up to 120 using comparative language;
- **1.2F** order whole numbers up to 120 using place value and open number lines;
- **1.2G** represent the comparison of two numbers to 100 using the symbols >, <, or =.

[1]While pennies and dimes are used throughout the module, 1.4A is not a focus grade level standard in Module 4. Instead, this standard becomes a focal standard in Module 6, when all coins are introduced and used.

[2]Focus on numbers to 40.

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:

- **1.3A** use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99;
- **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;
- **1.3D** 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:

- **1.5A** recite numbers forward and backward from any given number between 1 and 120;
- **1.5B** skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set;
- **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.

Foundational Standards

The student is expected to:

- **K.2F** generate a number that is one more than or one less than another number up to at least 20;
- **K.2I** compose and decompose numbers up to 10 with objects and pictures.

Focus Mathematical Process Standards

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

MPS(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

MPS(E) create and use representations to organize, record, and communicate mathematical ideas;

MPS(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS	Topics and Objectives			Days
1.2A **1.2B** **1.2C** **1.2D** **1.5A** **1.5B** **1.5C** 1.4A	1.B 1.C 1.F 2.C 2.E 2.I 3.E 3.F 4.C 4.G	A	**Tens and Ones**		6
			Lesson 1:	Compare the efficiency of counting by ones and counting by tens.	
			Lesson 2:	Use the place value chart to record and name tens and ones within a two-digit number.	
			Lesson 3:	Interpret two-digit numbers as either tens and some ones or as all ones.	
			Lesson 4:	Write and interpret two-digit numbers as addition sentences that combine tens and ones.	
			Lesson 5:	Identify 10 more, 10 less, 1 more, and 1 less than a two-digit number.	
			Lesson 6:	Use dimes and pennies as representations of tens and ones.	
1.2E **1.2F** **1.2G** 1.2A 1.2B	1.C 2.C 2.E 2.I 3.E 4.B 4.G 5.B	B	**Comparison of Pairs of Two-Digit Numbers**		4
			Lesson 7:	Compare two quantities, and identify the greater or lesser of the two given numerals.	
			Lesson 8:	Compare quantities and numerals from left to right.	
			Lessons 9–10:	Use the symbols >, =, and < to compare quantities and numerals.	

TEKS	ELPS		Topics and Objectives	Days
1.3A **1.3D** **1.5C**	1.C 2.E 2.I 3.E 4.F 4.G	C	**Addition and Subtraction of Tens (Optional)** Lesson 11: Add and subtract tens from a multiple of 10. Lesson 12: Add tens to a two-digit number.	2
			Mid-Module Assessment: Topics A–C (assessment 1 day, return 1 day, remediation or further applications 1 day)	3
1.3A **1.3E**	1.C 1.E 2.E 2.I 3.E 3.F 4.F 4.G 5.G	D	**Addition of Tens or Ones to a Two-Digit Number** Lessons 13–14: Use counting on and the make ten strategy when adding across a ten. Lesson 15: Use single-digit sums to support solutions for analogous sums to 40. Lessons 16–17: Add ones and ones or tens and tens. Lesson 18: Share and critique peer strategies for adding two-digit numbers.	6
1.3B **1.3E** **1.3F** **1.5D**	1.C 2.C 2.I 3.D 3.E 3.H 4.F 4.G 5.G	E	**Varied Problem Types Within 20** Lesson 19: Use strip diagrams as representations to solve *put together/ take apart with total unknown* and *add to with result unknown* word problems. Lessons 20–21: Recognize and make use of part–whole relationships within strip diagrams when solving a variety of problem types. Lesson 22: Write word problems of varied types.	4

TEKS	ELPS	Topics and Objectives		Days
1.2A **1.2B** **1.3A**	1.C 1.H 2.E 2.I 3.D 3.E 3.H 4.C 4.G	F	**Addition of Tens and Ones to a Two-Digit Number** Lesson 23: Interpret two-digit numbers as tens and ones, including cases with more than 9 ones. Lessons 24–25: Add a pair of two-digit numbers when the ones digits have a sum less than or equal to 10. Lessons 26–27: Add a pair of two-digit numbers when the ones digits have a sum greater than 10. Lessons 28–29: Add a pair of two-digit numbers with varied sums in the ones.	7
			End-of-Module Assessment: Topics A–F (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

- > (greater than)
- < (less than)
- Place value (quantity represented by a digit in a particular place within a number)

Familiar Terms and Symbols[3]

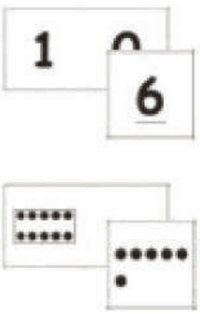
- = (equal)
- Numerals
- Ones
- Tens

Suggested Tools and Representations

- Arrow notation
- Comparison symbols: >, <, =
- Dime
- Hide Zero cards

$$26 \xrightarrow{+10} 36$$

Arrow Notation



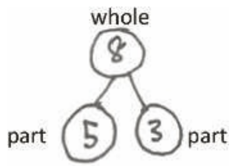
Hide Zero Cards

[3]These are terms and symbols students have seen previously.

- Hundred chart
- Number bond
- Penny
- Place value chart
- Quick Ten
- Rekenrek
- Strip diagram

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

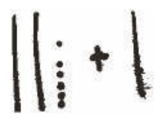
Hundred Chart to 40



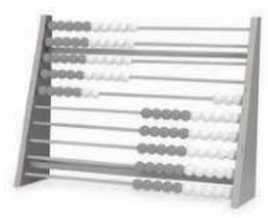
Number Bond

tens	ones
3	4

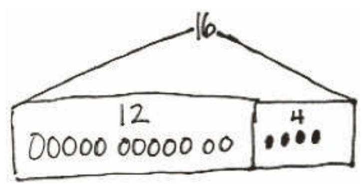
Place Value Chart



Quick Ten



Rekenrek



Strip Diagram

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 applicable to more than one population. The charts included in Module 1 provide a general overview of the lesson-aligned scaffolds, organized by Universal Design for Learning (UDL) principles.

Assessment Summary

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

Table of Contents

GRADE 1 • MODULE 5

Identifying, Composing, and Partitioning Shapes

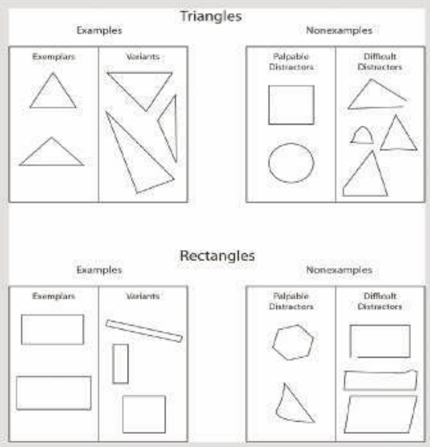
Grade 1 • Module 5

Identifying, Composing, and Partitioning Shapes

OVERVIEW

Throughout the year, students have explored part–whole relationships in many ways, such as their work with number bonds, strip diagrams, and the relationship between addition and subtraction. In Module 5, students consider part–whole relationships through a geometric lens.

In Topic A, students identify the defining parts, or attributes, of two-and three-dimensional shapes, building on their kindergarten experiences of sorting, analyzing, comparing, and creating various two-and three-dimensional shapes and objects (**1.6A, 1.6B, 1.6E, 1.6D**). Using straws, students begin the exploration by creating and describing two-dimensional shapes without naming them. This encourages students to attend to and clarify a shape's defining attributes. In the following lessons, students name two-and three-dimensional shapes and find them in pictures and in their environment. New shape names are added to the students' repertoire, including *trapezoid, rhombus, cone*, and *rectangular prism*.



Exemplars are the typical visual prototypes of the shape category.

Variants are other examples of the shape category.

Palpable distractors are nonexamples with little or no overall resemblance to the exemplars.

Difficult distractors are visually similar to examples but lack at least one defining attribute.

In Topic B, students combine shapes to create a new whole: a composite shape (**1.6C, 1.6F**). Students identify the name of the composite shape as well as the names of each shape that forms it. Students see that another shape can be added to a composite shape so that the composite shape becomes part of an even larger whole.

In Topic C, students relate geometric figures to equal parts and name the parts as halves and fourths (or quarters) (**1.6G, 1.6H**). For example, students now see that a rectangle can be partitioned into two equal triangles (whole to part) and that the same triangles can be recomposed to form the original rectangle (part to whole). Students see that as they create more parts, decomposing the shares from halves to fourths, the parts get smaller.

The module closes with Topic D, in which students apply their understanding of halves (**1.6G, 1.6H**) to tell time to the hour and half hour (**1.7E**). Students construct simple clocks and begin to understand the hour hand, then the minute hand, and then both together. Throughout each lesson, students read both digital and analog clocks to tell time.

Throughout Module 5, students continue daily fluency with addition and subtraction, preparing for Module 6, where they will add within 100 and ensure their mastery of the grade-level fluency goal of sums and differences within 10.

Notes on Pacing for Differentiation

The work of this module is foundational to the Geometry domain of the Grade 1 standards. Therefore, it is not recommended to omit any lessons from Module 5.

Focus Grade Level Standards

Geometry and Measurement

The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:

1.6A classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language;

1.6B distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape;

1.6C create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons;

1.6D identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons and describe their attributes using formal geometric language;

1.6E identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language;

1.6F compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible;

1.6G partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words;

1.6H identify examples and non-examples of halves and fourths.

Geometry and Measurement

The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:

1.7E tell time to the hour and half hour using analog and digital clocks.

Foundational Standards

The student is expected to:

- **K.6A** identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles;
- **K.6B** identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world;
- **K.6C** identify two-dimensional components of three-dimensional objects;
- **K.6E** classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size;
- **K.6F** create two-dimensional shapes using a variety of materials and drawings.

Focus Mathematical Process Standards

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

- **MPS(A)** apply mathematics to problems arising in everyday life, society, and the workplace;
- **MPS(B)** use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
- **MPS(E)** create and use representations to organize, record, and communicate mathematical ideas.

Overview of Module Topics and Lesson Objectives

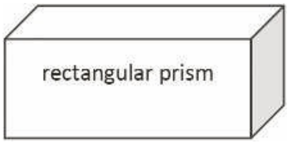
TEKS	ELPS		Topics and Objectives	Days
1.6A **1.6B** **1.6D** **1.6E**	1.F 2.B 2.C 2.E 2.I 3.A 3.E 3.J 4.F 4.G 5.G	A	**Attributes of Shapes** Lesson 1: Classify shapes based on defining attributes using examples, variants, and non-examples. Lesson 2: Find and name two-dimensional shapes including trapezoid, rhombus, and a square as a special rectangle, based on defining attributes of sides and corners. Lesson 3: Find and name three-dimensional shapes including cone and rectangular prism, based on defining attributes of faces and points.	3
1.6C **1.6F** 1.6D 1.6E	1.C 2.B 2.E 2.I 3.A 3.D 3.E 3.J 4.G 5.B	B	**Part–Whole Relationships Within Composite Shapes** Lesson 4: Create composite shapes from two-dimensional shapes. Lesson 5: Compose a new shape from composite shapes. Lesson 6: Create a composite shape from three-dimensional shapes and describe the composite shape using shape names and positions.	3
1.6G **1.6H**	1.C 2.B 2.D 2.E 2.I 3.A 3.E 4.G 5.B	C	**Halves and Quarters of Rectangles and Circles** Lesson 7: Name and count shapes as parts of a whole, recognizing relative sizes of the parts. Lessons 8–9: Partition shapes and identify halves and quarters of circles and rectangles.	3
1.6G **1.6H** **1.7E**	1.E 2.C 2.H 2.I 3.A 3.E 3.G 4.B	D	**Application of Halves to Tell Time** Lesson 10: Construct a paper clock by partitioning a circle and tell time to the hour. Lessons 11–13: Recognize halves within a circular clock face and tell time to the half hour.	4
			End-of-Module Assessment: Topics A–D (assessment ½ day, return ½ day, remediation or further applications 1 day)	2
Total Number of Instructional Days				**15**

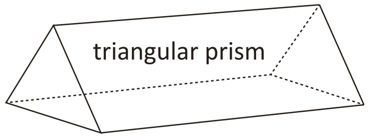
Terminology

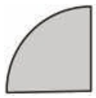
New or Recently Introduced Terms

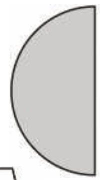
- Attributes (characteristics of an object such as color or number of sides)
- Composite shapes (shapes composed of two or more shapes)
- Digital clock
- Face (two-dimensional surface of a three-dimensional solid)
- Fourth of (shapes), fourths (1 out of 4 equal parts)
- Half hour (interval of time lasting 30 minutes)
- Half of, halves (1 out of 2 equal parts)
- Half past (expression for 30 minutes past a given hour)
- Hour (unit for measuring time, equivalent to 60 minutes or 1/24 of a day)
- Hour hand (component on clock tracking hours)
- Minute (unit for measuring time, equivalent to 60 seconds or 1/60 of an hour)
- Minute hand (component on clock tracking minutes)
- O'clock (used to indicate time to a precise hour, with no additional minutes)
- Quarter of (shapes) (1 out of 4 equal parts)
- Three-dimensional shapes:
    - Cone
    - Rectangular prism
    - Triangular prism
- Two-dimensional shapes:
    - Half-circle
    - Quarter-circle
    - Rhombus (flat figure enclosed by four straight sides of the same length wherein two pairs of opposite sides are parallel)
    - Trapezoid (a quadrilateral in which exactly one pair of opposite sides is parallel[1])

digital clock






quarter-circle


half-circle

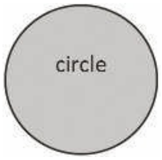
[1]This is the formal definition that students learn in Grade 4. It is placed here to signify to teachers the precise definition used in later grades and is not required to be shared with students now. Descriptive explanations such as, "This is a trapezoid. What are its interesting features?" are the general expectation for Grades 1 and 2.

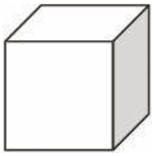
Familiar Terms and Symbols[2]

- Clock
- Shape names (two-dimensional and three-dimensional) from Kindergarten:

clock

  - Circle
  - Cube
  - Cylinder
  - Hexagon (flat figure enclosed by six straight sides)
  - Rectangle (flat figure enclosed by four straight sides and four right angles)
  - Sphere
  - Square (rectangle with four sides of the same length)
  - Triangle (flat figure enclosed by three straight sides)





Suggested Tools and Representations

- Pattern blocks
- Square tiles
- Straws
- Student clocks, preferably with gears that can provide the appropriate hour-hand alignment
- Three-dimensional shape models (commercially produced or commonly found examples) including cube, cone, cylinder, rectangular prism, and sphere

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.

[2]These are terms and symbols students have seen previously.

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
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.6A 1.6B 1.6C 1.6D 1.6E 1.6F 1.6G 1.6H 1.7E

Table of Contents

GRADE 1 • MODULE 6

Place Value, Comparison, Understanding Income with Addition and Subtraction to 100

Grade 1 • Module 6

Place Value, Comparison, Understanding Income with Addition and Subtraction to 100

OVERVIEW

In this final module of the Grade 1 curriculum, students bring together their learning from Module 1 through Module 5 to learn the most challenging Grade 1 standards and celebrate their progress.

In Topic A, students grapple with comparative word problem types (**1.3B, 1.5D**). While students solved some comparative problem types during Module 3 and within the Application Problems in Module 5, this is their first opportunity to name these types of problems and learn to represent comparisons using strip diagrams with two strips.

Students extend their understanding of and skill with tens and ones to numbers to 100 in Topic B (**1.2B**). For example, they mentally find 10 more, 10 less, 1 more, and 1 less (**1.5C**) and compare numbers using the symbols >, =, and < (**1.2G**). They then count and write numbers to 120 (**1.2C**) using both standard numerals and the unit form.

In Topics C and D, students again extend their learning from Module 4 to the numbers to 100 to add and subtract (**1.3A, 1.3D**). They add pairs of two-digit numbers in which the ones digits sometimes have a sum greater than 10, recording their work using various methods based on place value (**1.3A**). In optional Topic D, students focus on using drawings, numbers, and words to solve, highlighting the role of place value, the properties of addition, and related facts.

At the start of the second half of Module 6, students are reintroduced to nickels and quarters (**1.4A**), which were first introduced in Kindergarten. Students have already used pennies and dimes in the context of their work with numbers to 40 in Module 4. Students use their knowledge of tens and ones to explore decompositions of the values of coins. For example, they might represent 25 cents using 1 quarter, 25 pennies, 2 dimes and 1 nickel, or 1 dime and 15 pennies. Students learn to use the cent symbol as they count and record the value of coins (**1.4B**).

The focus of Topic F is personal financial literacy (**1.9**). Students explore income and gifts, spending and saving, needs and wants, and charitable giving. They will continue their work of adding and subtracting within 20 in the context of financial literacy.

In Topic G, students really dig into MPS(A), MPS(B), and MPS(G). The topic includes the more challenging *compare with bigger or smaller unknown* word problem types, wherein *more* or *less* suggests the incorrect operation (**1.3B, 1.5D**), thus giving a context for more in-depth discussions and critiques. On the final day of this topic, students work with varied problem types, sharing and explaining their strategies and reasoning. Peers ask each other questions and defend their choices. The End-of-Module Assessment follows Topic G.

The module and year close with Topic H, wherein students celebrate their year's worth of learning with fun fluency festivities that equip them with games to maintain their fluency during the summer months prior to Grade 2.

Notes on Pacing for Differentiation

During Module 4, addition and subtraction work is limited to numbers within 40. In Module 6, students extend into numbers within 100. If students are readily able to apply their learning from Module 4 to Module 6, consider consolidating lessons in Topics A, B, and C (e.g., Lessons 3 and 4, Lessons 5 and 6, and Lessons 10 and 11). In Topic C, use each day's Exit Ticket to determine whether the lessons that follow can be omitted or consolidated.

Topic D is an optional extension and therefore may be omitted.

Topic E, Coins and Their Values, might be modified, omitted, or embedded throughout the instructional day depending on the standards in the state implementing the curriculum.

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:

1.2B use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones;

1.2C use objects, pictures, and expanded and standard forms to represent numbers up to 120;

1.2D generate a number that is greater than or less than a given whole number up to 120;

1.2E use place value to compare whole numbers up to 120 using comparative language;

1.2F order whole numbers up to 120 using place value and open number lines;

1.2G represent the comparison of two numbers to 100 using the symbols >, <, or =.

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:

1.3A use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99;

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;

1.3D apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10.

Number and Operations

The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the need for monetary transactions. The student is expected to:

1.4A identify U.S. coins, including pennies, nickels, dimes, and quarters, by value and describe the relationships among them;

1.4B write a number with the cent symbol to describe the value of a coin;

1.4C use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes.

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:

1.5A recite numbers forward and backward from any given number between 1 and 120;

1.5B skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set;

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;

1.5G apply properties of operations to add and subtract two or three numbers.

Personal Financial Literacy

The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:

1.9A	define money earned as income;
1.9B	identify income as a means of obtaining goods and services, oftentimes making choices between wants and needs;
1.9C	distinguish between spending and saving;
1.9D	consider charitable giving.

Foundational Standards

The student is expected to:

K.2F	generate a number that is one more than or one less than another number up to at least 20;
K.2I	compose and decompose numbers up to 10 with objects and pictures;
K.3B	solve word problems using objects and drawings to find sums up to 10 and differences within 10;
K.3C	explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences.

Focus Mathematical Process Standards

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

MPS(A)	apply mathematics to problems arising in everyday life, society, and the workplace;
MPS(B)	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;
MPS(C)	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;
MPS(D)	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;
MPS(G)	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS		Topics and Objectives	Days
1.3B **1.5D**	1.E 2.I 4.A 4.E 4.G 4.H 4.I 4.J 4.K 5.G	A	**Comparison Word Problems** Lesson 1: Solve *compare with difference unknown* problem types. Lesson 2: Solve *compare with bigger or smaller unknown* problem types.	2
1.2B **1.2C** **1.2D** **1.2E** **1.2F** **1.2G** **1.5A** **1.5B** **1.5C**	1.C 2.C 2.E 2.I 3.C 3.E 3.G 4.B 4.C	B	**Numbers to 120** Lesson 3: Use the place value chart to record and name tens and ones within a two-digit number up to 100. Lesson 4: Write and interpret two-digit numbers to 100 as addition sentences that combine tens and ones. Lesson 5: Identify 10 more, 10 less, 1 more, and 1 less than a two-digit number within 100. Lesson 6: Use the symbols >, =, and < to compare quantities and numerals to 100. Lesson 7: Count and write numbers to 120. Use Hide Zero cards to relate numbers 0 to 20 to 100 to 120. Lesson 8: Count to 120 in unit form using only tens and ones. Represent numbers to 120 as tens and ones on the place value chart. Lesson 9: Represent up to 120 objects with a written numeral.	7
1.3A **1.3D** 1.5A 1.5C	1.C 1.D 2.C 2.D 2.E 3.E 3.F 3.H 3.I 4.C	C	**Addition to 100 Using Place Value Understanding** Lesson 10: Add and subtract multiples of 10 from multiples of 10 to 100, including dimes. Lesson 11: Add a multiple of 10 to any two-digit number within 100. Lesson 12: Add a pair of two-digit numbers when the ones digits have a sum less than or equal to 10. Lessons 13–14: Add a pair of two-digit numbers when the ones digits have a sum greater than 10 using decomposition. Lesson 15: Add a pair of two-digit numbers when the ones digits have a sum greater than 10 with drawing. Record the total below. Lessons 16–17: Add a pair of two-digit numbers when the ones digits have a sum greater than 10 with drawing. Record the new ten below.	8

TEKS	ELPS	Topics and Objectives		Days
1.5G	1.H 2.C 3.E 4.C 5.G	D	**Varied Place Value Strategies for Addition to 100** Lesson 18: Add a pair of two-digit numbers with varied sums in the ones, and compare the results of different recording methods. (Optional) Lesson 19: Solve and share strategies for adding two-digit numbers with varied sums. (Optional)	2
			Mid-Module Assessment: Topics A–D (assessment 1 day, return ½ day, remediation or further applications ½ day)	2
1.4A **1.4B** **1.4C**	1.A 1.F 2.E 2.I 3.E 3.H 3.J 4.B 5.B	E	**Coins and Their Values** Lesson 20: Identify pennies, nickels, and dimes by their image, name, or value. Decompose the values of nickels and dimes using pennies and nickels. Recognize and write the cent symbol (¢). Lesson 21: Identify quarters by their image, name, or value. Decompose the value of a quarter using pennies, nickels, and dimes. Lesson 22: Identify varied coins by their image, name, or value. Add one cent to the value of any coin. Lesson 23: Count on using pennies from any single coin. Lesson 24: Use dimes and pennies as representations of numbers to 120.	5
1.9A **1.9B** **1.9C** **1.9D**	2.C 2.E 3.H 4.G 5.B	F	**Income and Responsible Spending** Lesson 25: Understand spending and saving income. Lesson 26: Understand the difference between wants and needs. Lesson 27: Consider charitable giving as an option for spending money.	3
1.3B **1.5D**	1.C 2.I 3.E 4.A 4.E 4.F 4.H 4.I 4.J 4.K 5.G	G	**Varied Problem Types Within 20** Lessons 28–29: Solve *compare with bigger or smaller unknown* problem types. Lesson 30: Share and critique peer strategies for solving problems of varied types.	3
			End-of-Module Assessment: Topics A–G (assessment 1 day, return ½ day, remediation or further applications ½ day)	2
1.3D	1.E 3.G 4.B	H	**Culminating Experiences** Lessons 31–32: Celebrate progress in fluency with adding and subtracting within 10 (and 20). Organize engaging summer practice.	2
Total Number of Instructional Days				**36**

Terminology

New or Recently Introduced Terms

- Dime
- Nickel
- Penny
- Quarter

Familiar Terms and Symbols[1]

- <, >, = (less than, greater than, equal to)

Suggested Tools and Representations

- 100-bead Rekenrek
- Strip diagram

Homework

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[1]These are terms and symbols students have seen previously.

Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic D	Constructed response with rubric	1.2B 1.2C 1.2D 1.2E 1.2G 1.3B 1.3D 1.5A 1.5C 1.5D 1.5G
End-of-Module Assessment Task	After Topic G	Constructed response with rubric	1.2B 1.2C 1.2D 1.2G 1.3A 1.3B 1.3D 1.4A 1.4B 1.5A 1.5C 1.5D 1.9A 1.9C