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Sums and Differences to 10

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Grade 1 • Module 1

Sums and Differences to 10

OVERVIEW

In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 (1.OA.6) 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.OA.1), with a special focus on the numbers 6, 7, 8, and 9, since recognizing how much a number needs to make 10 is part of the Kindergarten standards (K.OA.4) and easier for most children. Students decompose numbers into two sets, or conceptually subitize, 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, 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.OA.5).

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.OA.1, 1.OA.5). 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.OA.1).
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.OA.4).¹

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 (1.OA.5). In Lesson 16, they solve problems such as $4 + ___ = 7$ by tracking the number of counts as they say, “5, 6, 7” (1.OA.8).

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.OA.3 and 1.OA.7). 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 (1.OA.1, 1.OA.4). The topic then uses the strategies of counting with both 5-group cards and the number path to solve subtraction problems (1.OA.5, 1.OA.6).

¹ For an analysis of addition and subtraction word problem types used in Grades K–2, please refer to the Counting and Cardinality Progression, pages 7 and 9, and the Standards, page 88.
Topic H is analogous to Topic C. Students interpret the meaning of subtraction as they solve different problem types involving subtraction (1.OA.1). Throughout Module 1, rather than using formal drawings or tape 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.OA.6).

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—Grade 1**

**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.

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.
Module 2

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.

Module 3

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.

Module 4

The work of this module is foundational to the Number and Operations in Base Ten domain of the Grade 1 standards. Therefore, it is not recommended to omit any lessons from Module 4.

Module 5

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.

Module 6

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 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.
Distribution of Instructional Minutes

This diagram represents a suggested distribution of instructional minutes based on the emphasis of particular lesson components in different lessons throughout the module.

<table>
<thead>
<tr>
<th>Lessons</th>
<th>1</th>
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<tbody>
<tr>
<td>MP.7</td>
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MP = Mathematical Practice

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Focus Grade Level Standards

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.3 Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)

1.OA.4 Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.

Add and subtract within 20.

1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Work with addition and subtraction equations.

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 = □.

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2 In this module, work is limited to within 10.
3 1.OA.2 is addressed in Module 2.
Foundational Standards

K.CC.2  Count forward beginning from a given number within the known sequence (instead of having to begin at 1).

K.CC.4b  Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.

K.CC.4c  Understand that each successive number name refers to a quantity that is one larger.

K.OA.3  Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

K.OA.4  For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

K.OA.5  Fluently add and subtract within 5.

Focus Standards for Mathematical Practice

MP.2  Reason abstractly and quantitatively. Students make sense of quantities and their relations as they reason about two new problem types in Grade 1: change unknown and addend unknown. They write an addition sentence that corresponds to the situation and then reason to see that a subtraction number sentence also can be used to solve for the unknown. Furthermore, in Topic D, students decontextualize addition from stories and work on strategies for computing.

MP.6  Attend to precision. Students clarify the meaning of the commutative property as they represent the same stories with repositioned addends. Students also state the meaning of the equal sign when they represent one amount with two different expressions connected by the equal sign.

MP.7  Look for and make use of structure. Students use the structure of embedded numbers or a known part from which to count on to find a total. After studying the commutative property, the larger addend becomes a structure from which to count on. Also, 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.

MP.8  Look for and express regularity in repeated reasoning. Students recognize when they are adding they are counting on by the same amount (e.g., + 2 or + 3 is the same as counting on by 2 or 3). Therefore, they apply the same strategy to solve other problems, recognizing the repetition of the reasoning.
### Overview of Module Topics and Lesson Objectives

<table>
<thead>
<tr>
<th>Standards</th>
<th>Topics and Objectives</th>
<th>Days</th>
</tr>
</thead>
</table>
| **A** 1.OA.1 1.OA.5 | **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    |
| **B** 1.OA.1 1.OA.5 1.OA.6 | **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    |
| **C** 1.OA.1 1.OA.6 1.OA.5 | **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    |
<table>
<thead>
<tr>
<th>Standards</th>
<th>Topics and Objectives</th>
<th>Days</th>
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</thead>
</table>
| 1.OA.5 1.OA.8 1.OA.6 | **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.OA.3 1.OA.7 | **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.OA.3 1.OA.6 | **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 |
| 1.OA.5 1.OA.4 1.OA.5 | **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 |
| 1.OA.4 1.OA.5 1.OA.8 | **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. | 5 |

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### Module Overview

<table>
<thead>
<tr>
<th>Standards</th>
<th>Topics and Objectives</th>
<th>Days</th>
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<tbody>
<tr>
<td></td>
<td>Lesson 30: Solve <em>add to with change unknown</em> math stories with drawings, relating addition and subtraction.</td>
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<tr>
<td></td>
<td>Lesson 31: Solve <em>take from with change unknown</em> math stories with drawings.</td>
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<td></td>
<td>Lesson 32: Solve <em>put together/take apart with addend unknown</em> math stories.</td>
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<tr>
<td>1.OA.5</td>
<td>Decomposition Strategies for Subtraction</td>
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<tr>
<td>1.OA.6</td>
<td>Lesson 33: Model 0 less and 1 less pictorially and as subtraction number sentences.</td>
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<td>1.OA.4</td>
<td>Lesson 34: Model <em>n – n</em> and <em>n – (n – 1)</em> pictorially and as subtraction sentences.</td>
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<td>Lesson 35: Relate subtraction facts involving fives and doubles to corresponding decompositions.</td>
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<td>Lesson 36: Relate subtraction from 10 to corresponding decompositions.</td>
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<td>Lesson 37: Relate subtraction from 9 to corresponding decompositions.</td>
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<td>1.OA.6</td>
<td>Development of Subtraction Fluency Within 10</td>
<td>2</td>
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<tr>
<td></td>
<td>Lesson 38: Look for and make use of repeated reasoning and structure, using the addition chart to solve subtraction problems.</td>
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<td></td>
<td>Lesson 39: Analyze the addition chart to create sets of related addition and subtraction facts.</td>
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<tr>
<td></td>
<td>End-of-Module Assessment: Topics A–J (assessment 1 day, return 1 day, remediation or further applications 1 day)</td>
<td>3</td>
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</table>

**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 $4 + 5$)

Familiar Terms and Symbols

- 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

Suggested Tools and Representations

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

These are terms and symbols students have used or seen previously.
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” x 8 ½”
1 piece of stiff white tag board 11” x 8 ¼”
1 3” x 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.”

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 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.

5 Students with disabilities may require Braille, large print, audio, or special digital files. Please visit the website www.p12.nysed.gov/specialed/aim for specific information on how to obtain student materials that satisfy the National Instructional Materials Accessibility Standard (NIMAS) format.

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 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?

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.

<table>
<thead>
<tr>
<th>Anticipated Difficulty</th>
<th>“Must Do” Remedial Problem Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>The first problem of the Problem Set is too challenging.</td>
<td>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.</td>
</tr>
<tr>
<td>There is too big of a jump in complexity between two problems.</td>
<td>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.”</td>
</tr>
<tr>
<td>Students lack fluency or foundational skills necessary for the lesson.</td>
<td>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.</td>
</tr>
<tr>
<td>More work is needed at the concrete or pictorial level.</td>
<td>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.</td>
</tr>
<tr>
<td>More work is needed at the abstract level.</td>
<td>Hone the Problem Set to reduce the amount of drawing as appropriate for certain students or the whole class.</td>
</tr>
</tbody>
</table>

7 See the Progression Documents “K, Counting and Cardinality” and “K–5, Operations and Algebraic Thinking” pp. 9 and 23, respectively.
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

<table>
<thead>
<tr>
<th>Type</th>
<th>Administered</th>
<th>Format</th>
<th>Standards Addressed</th>
</tr>
</thead>
</table>
| Mid-Module Assessment Task  | After Topic F| Constructed response with rubric | 1.OA.1  
1.OA.3  
1.OA.5  
1.OA.6  
1.OA.7  
1.OA.8 |
| End-of-Module Assessment Task | After Topic J | Constructed response with rubric | 1.OA.1  
1.OA.3  
1.OA.4  
1.OA.5  
1.OA.6  
1.OA.7  
1.OA.8 |