



Table of Contents

GRADE 2 • MODULE 1

Sums and Differences to 20

Module Overview	i
Topic A: Foundations for Addition and Subtraction Within 20	1.A.1
Topic B: Mental Strategies for Addition and Subtraction Within 20	1.B.1
Topic C: Strategies for Addition and Subtraction Within 100	1.C.1
Module Assessment	1.S.1

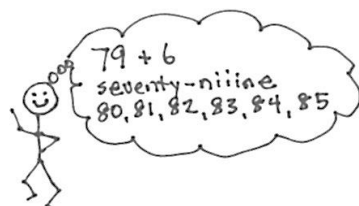
Grade 2 • Module 1

Sums and Differences to 20

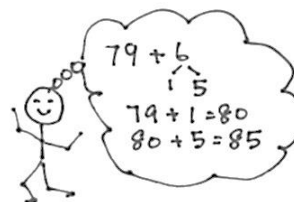
OVERVIEW

Module 1 sets the foundation for students to master sums and differences to 20 (**2.OA.2**). Students subsequently apply these skills to fluently add one-digit to two-digit numbers at least through 100 using place value understanding, properties of operations, and the relationship between addition and subtraction (**2.NBT.5**). In Grade 1, students worked extensively with numbers to 10 and developed Level 2 and Level 3 mental strategies to add and subtract within 20 (**1.OA.1**) and 100 (**1.NBT.4–6**).

Level 2: Count on



Level 3: Decompose an addend to compose ten



For example, to solve $12 + 3$ students might make an equivalent but easier problem by decomposing 12 as 10 and 2 and composing 2 with 3 to make 5. Students can use this knowledge to solve related problems such as $92 + 3$. They also apply this skill using smaller numbers to subtract problems with larger numbers: $12 - 8 = 10 - 8 + 2 = 2$, just as $72 - 8 = 70 - 8 + 2 = 62 + 2$.

$$\begin{array}{r} 12 + 3 \\ / \backslash \\ 10 \quad 2 \end{array} \quad 12 + 3 = 10 + 2 + 3 = 10 + 5$$

$$\begin{array}{r} 12 - 8 \\ / \backslash \\ 10 \quad 2 \end{array} \quad 12 - 8 = 10 - 8 + 2 = 2 + 2$$

$$\begin{array}{r} 92 + 3 \\ / \backslash \\ 90 \quad 2 \end{array} \quad 92 + 3 = 90 + 2 + 3 = 90 + 5$$

$$\begin{array}{r} 72 - 8 \\ / \backslash \\ 70 \quad 2 \end{array} \quad 72 - 8 = 70 - 8 + 2 = 62 + 2$$

Daily fluency activities provide sustained practice to help students attain fluency within 20. This fluency is essential to the work of later modules and future grade levels, where students must efficiently recompose place value units to work adeptly with the four operations. Activities such as Say Ten counting, Take from Ten, and the use of ten-frame and Hide Zero cards solidify student fluency. Because the amount of practice required by each student to achieve mastery will vary, a motivating, differentiated fluency program needs to be established in these first weeks to set the tone for the rest of the year.

Throughout the module, students will represent and solve one-step word problems through the daily Application Problem (**2.OA.1**). Note that one-step problems may have multiple parts that are separated by bullets or letters. Each part requires only one operation. These multi-part problems serve as a stepping-stone toward multi-step problems. Application Problems can precede a lesson to act as the lead-in to a concept, allowing students to discover through problem-solving the logic and usefulness of a strategy before

that strategy is formally presented. Or, they can follow the Concept Development so that students connect and apply their learning to real-world situations. This latter structure can also serve as a bridge between teacher-directed work and students solving problems independently on Problem Sets and at home. In either case, problem-solving begins as a guided activity, with the goal being to move students to independent problem-solving, wherein they reason through the relationships of the problem and choose an appropriate strategy to solve. In Module 1, Application Problems follow Concept Development.

Topic A reactivates students' Kindergarten and Grade 1 learning as they practice prerequisite skills for Level 3 decomposition and composition methods: partners to 10 and decompositions for all numbers within 10.¹ Students move briskly from concrete to pictorial to abstract as they remember their make ten facts. They use ten-frame cards to visualize 10, and they write the number bonds of 10 from memory. They use those facts to see relationships in larger numbers (e.g., 28 needs how many to make 30?). The number bond is also used to represent related facts within 10.

Topic B also moves from concrete to pictorial to abstract, as students use decomposing strategies to add and subtract within 20. By the end of Grade 1 Module 2, students learned to form ten as a unit. Hence, the phrase *make ten* now transitions to *make a ten*. Students use the ten-structure to reason about making a ten to add to the teens, and they use this pattern and math drawings to solve related problem sets (e.g., $9 + 4$, $9 + 5$, $9 + 6$). Students reason about the relationship between problems such as $19 + 5$ and $20 + 4$ to $9 + 5$ and $10 + 4$. They use place value understanding to add and subtract within 20 by adding to and subtracting from the ones. The topic ends with a lesson in which students subtract from 10. The goal in making a 10 and taking from 10 is for students to master mental math.

$$\begin{array}{r} 13 + 2 = 15 \\ \diagup \quad \diagdown \\ 10 \quad 3 \end{array}$$

$$\begin{array}{r} 15 - 3 = 12 \\ \diagup \quad \diagdown \\ 10 \quad 5 \end{array}$$

$$\begin{array}{r} 3 + 2 = 5 \\ 13 + 2 = 15 \end{array}$$

$$\begin{array}{r} 5 - 3 = 2 \\ 15 - 3 = 12 \end{array}$$

Add and subtract ones

$$\begin{array}{r} 14 - 8 = 6 \\ \diagup \quad \diagdown \\ 10 \quad 4 \end{array}$$

$$\begin{array}{r} 10 - 8 = 2 \\ 4 + 2 = 6 \\ 14 - 8 = 6 \end{array}$$

Take from 10

Topic C calls on students to review strategies to add and subtract within 100 (**1.NBT.4–6**) to set the foundation for Grade 2's work towards mastery of fluency with the same set of problems (**2.NBT.5**). They use basic facts and place value understanding to add and subtract within multiples of 10 without crossing the multiple (e.g., $7 - 5 = 2$, so $47 - 5 = 42$). This segues into the use of basic facts and properties of addition to cross multiples of 10 (e.g., $26 + 9 = 20 + 6 + 4 + 5$). In the final lesson, students decompose to make a ten and then subtract from numbers that have both tens and ones.

$$\begin{array}{r} 87 + 5 = 92 \\ \diagup \quad \diagdown \quad \diagup \quad \diagdown \\ 80 \quad 7 \quad 3 \quad 2 \end{array}$$

$$80 + 10 + 2 = 92$$

Add basic facts to
cross multiples of 10

$$\begin{array}{r} 91 - 5 = 86 \\ \diagup \quad \diagdown \\ 81 \quad 10 \end{array}$$

$$\begin{array}{r} 10 - 5 = 5 \\ 81 + 5 = 86 \end{array}$$

Decompose and
subtract from the
10

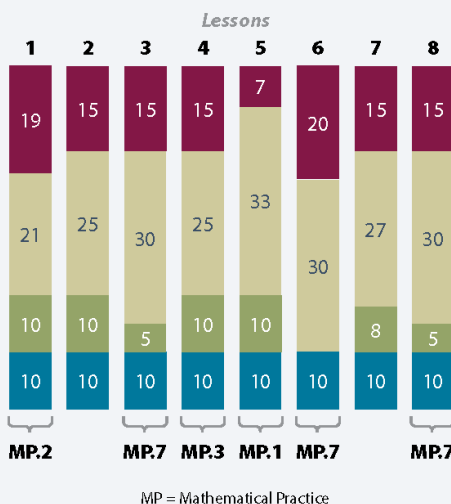
¹ K.OA.4 and K.OA.3



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.

- **Fluency Practice**
- **Concept Development**
- **Application Problems**
- **Student Debrief**



Focus Grade Level Standards

Represent and solve problems involving addition and subtraction.²

- 2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See CCLS Glossary, Table 1.)

Add and subtract within 20.³

- 2.OA.2** Fluently add and subtract within 20 using mental strategies. (See standard 1.OA.6 for a list of mental strategies.) By end of Grade 2, know from memory all sums of two one-digit numbers.

Use place value understanding and properties of operations to add and subtract.⁴

- 2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

² In this module, word problems focus primarily on result unknown and change unknown situations.

³ From this point forward, fluency practice with addition and subtraction to 20 is part of the students' ongoing experience.

⁴ The balance of this cluster is addressed in Modules 4 and 5.

Foundational Standards

- 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.NBT.1** Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
- 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 $6 + 6 = 12$ and $12 + 1 = 13$).
- 1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
- 1.NBT.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
- 1.NBT.6** Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Focus Standards for Mathematical Practice

- MP.1** **Make sense of problems and persevere in solving them.** Students make math drawings and use recomposing strategies to reason through the relationships in word problems. They write equations and word sentences to explain their solutions.
- MP.2** **Reason abstractly and quantitatively.** Students decompose numbers and use the associative property to create equivalent but easier problems, e.g., $25 + 6 = 20 + 5 + 5 + 1$. They reason abstractly when they relate subtraction to addition and change $13 - 8 = \underline{\quad}$ into an unknown addend, $8 + \underline{\quad} = 13$, to solve.
- MP.3** **Construct viable arguments and critique the reasoning of others.** Students explain their reasoning to prove that $9 + 5 = 10 + 4$. They communicate how simpler problems embedded within more complex problems enable them to solve mentally, e.g., $8 + 3 = 11$, so $68 + 3 = 71$.
- MP.7** **Look for and make use of structure.** Students use the structure of ten to add and subtract within 20, and later, within 100, e.g., $12 - 8 = 10 - 8 + 2 = 2 + 2$, and $92 + 3 = 90 + 2 + 3 = 90 + 5$.

Overview of Module Topics and Lesson Objectives

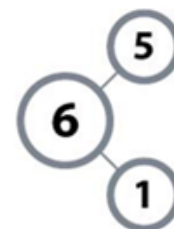
Standards	Topics and Objectives	Days
2.OA.1 2.OA.2 K.OA.3 K.OA.4 K.NBT.1 1.OA.6	A Foundations for Addition and Subtraction Within 20 Lesson 1: Make number bonds of ten. Lesson 2: Make number bonds through ten with a subtraction focus and apply to one-step word problems.	2
2.OA.1 2.OA.2	B Mental Strategies for Addition and Subtraction Within 20 Lesson 3: Make a ten to add within 20. Lesson 4: Make a ten to add and subtract within 20. Lesson 5: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems.	3
2.OA.1 2.NBT.5 2.OA.2 1.NBT.4 1.NBT.5 1.NBT.6	C Strategies for Addition and Subtraction Within 100 Lesson 6: Add and subtract within multiples of ten based on understanding place value and basic facts. Lesson 7: Add within 100 using properties of addition to make a ten. Lesson 8: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems.	3
	End-of-Module Assessment: Topics A–C (assessment $\frac{1}{2}$ day, return $\frac{1}{2}$ day, remediation or further applications 1 day)	2
Total Number of Instructional Days		10

Terminology

Familiar Terms and Symbols

- Expression (e.g., $2 + 1$, $13 - 6$)
- Make ten and subtract from ten (e.g., $8 + 3 = 8 + 2 + 1$ and $15 - 7 = 10 - 7 + 5 = 3 + 5$)
- Number bond (e.g., $5 + 1 = 6$, $1 + 5 = 6$, $6 - 1 = 5$, $6 - 5 = 1$)
- Say Ten counting (e.g., 11 is “1 ten 1,” 12 is “1 ten 2,” 20 is “2 tens,” 27 is “2 tens 7,” 35 is “3 tens 5,” 100 is “1 hundred,” 146 is “1 hundred 4 tens 6”)
- Ten plus (e.g., $10 + 3 = 13$, $30 + 5 = 35$, $70 + 8 = 78$)

Number bond

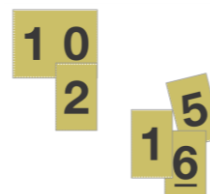


Regular	Say Ten
fifty-one	5 tens 1
sixty-seven	6 tens 7
seventy-five	7 tens 5
eighty-four	8 tens 4
ninety-five	9 tens 5

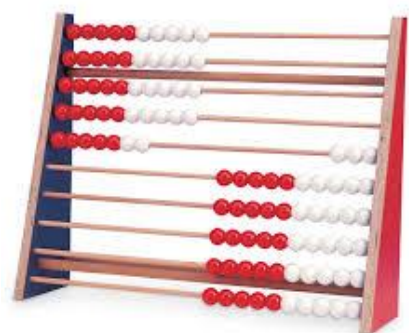
Suggested Tools and Representations

- Dice
- Hide Zero cards (Lesson 2 Template 1)
- Linking cubes
- Personal white boards
- Rekenrek
- Ten-frame cards, 1 set per student (Lesson 1 Template 1)
 - 1 each of 1–4 and 6–9
 - 2 fives
 - 10 tens
 - Blank frame
- Ten-frame cards large set for teacher
- Ten-strip (Lesson 4 Template)
- Two-sided counters for each student (e.g., large white beans spray painted red on one side)

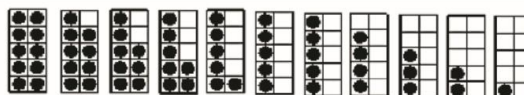
Hide Zero cards



Rekenrek



Ten-frame cards



Ten-strip



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 8 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.
- T: 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! (When you say THINK, students turn their 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 one has any more correct. If need be, 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 1 right? (All hands should go up.)
- T: Keep your hand up until I say the number that is 1 more than the number you got right. So, if you got 14 correct, when I say 15 your hand goes down. Ready?
- T: (Quickly.) How many got 2 correct? 3? 4? 5? (Continue until all hands are down.)

Optional routine, depending on whether or not your class needs more practice with *Sprint A*:

- 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 you might have the person who scored highest on *Sprint A* 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 Sprint 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. So if you got 3 more right on Sprint B than you did on Sprint A, when I say 3 you sit down. Ready? (Call out numbers starting with 1. 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.

RDW or Read, Draw, Write (a Number Sentence and a Statement)

Mathematicians and teachers suggest a simple process applicable to all grades:

- 1) Read.
- 2) Draw and label.
- 3) Write a number sentence (equation).
- 4) Write a word sentence (statement).

The more students participate in reasoning through problems with a systematic approach, the more they internalize those behaviors and thought processes.

- What do I see?
- Can I draw something?
- What conclusions can I make from my drawing?

Modeling with Interactive Questioning	Guided Practice	Independent Practice
The teacher models the whole process with interactive questioning, some choral response, and talk such as “What did Monique say, everyone?” After completing the problem, students might reflect with a partner on the steps they used to solve the problem. “Students, think back on what we did to solve this problem. What did we do first?” Students might then be given the same or a similar problem to solve for homework.	Each student has a copy of the question. Though guided by the teacher, they work independently at times and then come together again. Timing is important. Students might hear, “You have 2 minutes to do your drawing.” Or, “Put your pencils down. Time to work together again.” The Debrief might include selecting different student work to share.	The students are given a problem to solve and possibly a designated amount of time to solve it. The teacher circulates, supports, and is thinking about which student work to show to support the mathematical objectives of the lesson. When sharing student work, students are encouraged to think about the work with questions such as, “What do you notice about Jeremy’s work?” “What is the same about Jeremy’s work and Sara’s work?”

Personal White Boards

Materials Needed for Personal White Boards

- 1 heavy duty, clear sheet protector
- 1 piece of stiff red tag board $11" \times 8 \frac{1}{4}"$
- 1 piece of stiff white tag board $11" \times 8 \frac{1}{4}"$
- 1 $3" \times 3"$ piece of dark synthetic cloth for an eraser
- 1 low odor 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 then turn the board over to signal to the teacher 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 boards until we have more mastery.”
- Student 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 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 to write on.
- The red versus white side distinction clarifies your expectations. When working collaboratively, there is no need to use the red. When working independently, the students know how to keep their work private.
- The sheet protector can be removed so that student work can be projected on an overhead.

Scaffolds⁵

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*.”

Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic C	Constructed response with rubric	2.OA.1 2.OA.2 2.NBT.5

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.



Topic A

Foundations for Addition and Subtraction Within 20

2.OA.1, 2.OA.2, K.OA.3, K.OA.4, K.NBT.1, 1.OA.6

Focus Standards:	2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
Instructional Days:	2	
Coherence -Links from:	G1–M2	Introduction to Place Value Through Addition and Subtraction Within 20
-Links to:	G2–M4	Addition and Subtraction Within 200 with Word Problems to 100
	G3–M2	Place Value and Problem Solving with Units of Measure

In this first module of Grade 2, students make significant progress towards fluency with sums and differences within 20 (**2.OA.2**). Fluency, coupled with a fundamental grasp of place value, rests on three essential skills: 1) knowing number bonds of ten, 2) adding ten and some ones, and 3) knowing the number bonds (pairs) of numbers through ten. Topic A energetically revisits this familiar ground from Kindergarten (**K.OA.3**) and Grade 1 (**1.OA.6**) at a new pace; we move quickly from concrete to pictorial to abstract. All the material included herein can be included in daily fluency work, and should be if students lack fluency with mental strategies.

In Lesson 1, students use ten-frames to model number bonds of ten as they generate addition and subtraction number sentences and solve for the missing part by bonding, counting on, or subtracting. Students record and share number bonds of 10 to review their Grade 1 fluency and understanding. Lesson 2 continues with students revisiting number pairs through 10 and each pair's related facts. Again, students work with ten-frame cards to create number bonds and to determine a corresponding subtraction number sentence. As students play a part-whole game, they practice finding the missing part and decomposing a given quantity in a variety of ways.

The Application Problems in these earlier lessons follow the Concept Development to provide students with the opportunity to discover the connection between the one-step story problems (**2.OA.1**) and the models (i.e., ten-frames, number bonds) and to articulate their observations to classmates.

A Teaching Sequence Towards Mastery of Foundations for Addition and Subtraction Within 20

Objective 1: Make number bonds of ten.
(Lesson 1)

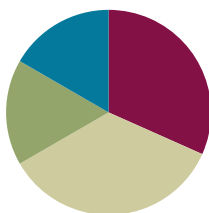
Objective 2: Make number bonds through ten with a subtraction focus and apply to one-step word problems.
(Lesson 2)

Lesson 1

Objective: Make number bonds of ten.

Suggested Lesson Structure

■ Fluency Practice	(19 minutes)
■ Concept Development	(21 minutes)
■ Application Problem	(10 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



NOTES ON FLUENCY PRACTICE:

Think of fluency activities as having three goals:

1. Maintenance (staying sharp on previously learned skills).
2. Preparation (targeted practice for the current lesson).
3. Anticipation (skills that ensure that students will be ready for the in-depth work of upcoming lessons).

Fluency Practice (19 minutes)

- Happy Counting 1–10 **2.NBT.2** (2 minutes)
- Break Ten in 2 Parts **2.OA.2** (5 minutes)
- Sprint: Add Tens and Some Ones **2.OA.2** (12 minutes)

Happy Counting 1–10 (2 minutes)

Note: On the first day, counting up and down to 10 simply alerts students to the fun and challenge of changing direction and establishing a protocol that will quickly advance to larger numbers as the module unfolds.

Make your hand motions emphatic so the students' counting is sharp and crisp. Once students get the hang of it, make the counting more challenging by skip-counting or starting at higher numbers. Also, resist the urge to mouth the answers. Students need to do the work, so they have to watch your fingers!

- T: Watch my hand to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)
- T: Let's count by ones starting at zero. Ready? (Rhythmically points up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)
- S: 0, 1, 2, 3, (stop) 2, 1, 0, (stop) 1, 2, 3, 4, 5, (stop) 4, 3, 2, 1, 0, (stop) 1, 2, 3, 4, 5, 6, 7, (stop) 6, 5, 4, (stop) 5, 6, 7, 8, 9, 10, (stop) 9, 8, 7, 6.
- T: Excellent! Try it for 30 seconds with your partner. Partner A, you are the teacher today.

Break Ten in 2 Parts (5 minutes)

Materials: (S) One stick of 10 linking cubes with a color change after the fifth cube

Note: Fluency with the bonds of numbers within 10 is one of the most important foundational skills. By starting at the concrete level, students quickly re-engage with their prior knowledge of these bonds to prepare for the lesson content.

T: Show me your 10 stick.

S: (Show.)

T: Hide it behind your back. I will say the size of one part. Break that part off in one piece. Then without peeking, see if you know how many are in the other part.

T: Ready?

S: Yes!

T: Break off 2. No peeking. At the signal, tell how many are in the other part. (Give signal.)

S: 8.

T: Show your parts and see if you are correct.

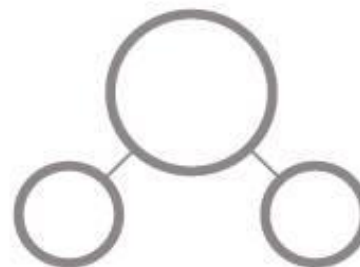
S: It's 8.

T: What parts are you holding?

S: 2 and 8.

T: What's the whole?

S: 10.



Continue with the following possible sequences: 3 and 7, 1 and 9, 4 and 6, and 5 and 5. Draw the bond (as pictured above right) and continue with the remaining bonds at an ever-quicken pace.

T: Turn and talk to your partner about how this game is the same as or different from than one you played in first grade.

T: How did knowing that help you play today?

T: Tell your partner which pattern or strategy helped you find the missing part when you couldn't peek at how many were left.

**NOTES ON
MULTIPLE MEANS OF
ACTION AND
EXPRESSION:**

For Sprints, a fast pace is essential and builds energy and excitement. To support students who don't excel under pressure, you may give them the chance to practice the Sprint at home the night before it is administered.

To maintain a high level of energy and enthusiasm, always do a stretch or a movement game in between Sprint A and Sprint B. For example, do jumping jacks while skip-counting by fives.

Sprint: Add Tens and Some Ones (12 minutes)

Materials: (S) Add Tens and Some Ones Sprint

Note: This particular choice brings automaticity back with the *ten plus* sums, which are foundational for the make a ten strategy and expanded form.

Directions for Administration of Sprints

One Sprint has two parts with closely related problems on each. The problems on each part move from simple to complex, creating a challenge for every learner. Before the lesson, cut the Sprint sheet in half to create Sprint A and Sprint B. 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 8 minutes.

Sprint A

(Put Sprint A face down on desks with instructions to not look at problems until the signal is given.)

- T: You will have 60 seconds to do as many problems as you can.
- T: I do not expect you to finish all of them. Just do as many as you can, your personal best.
- T: Take your mark! Get set! THINK! (When you say THINK, students turn papers over and work furiously to finish as many problems as they can in 60 seconds. Time precisely.)

(After 60 seconds:)

- 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?

(Repeat to the end of Sprint A or until no one has any more correct.)

- T: Now write your correct number at the top of the page. This is your personal goal for B.
- T: How many of you got 1 right? (All hands should go up.)
- T: Keep your hand up until I say a number that is 1 more than the number you got right. So, if you got 14 right, when I say 15 your hand goes down. Ready?
- T: (Quickly.) How many got 2 right? And 3, 4, 5, etc. (Continue until all hands are down.)

(Optional routine, depending on whether or not the class needs more practice with Sprint A.)

- T: Take one minute to do more problems on this half of the Sprint.

(As students work, you might have the person who scored highest on Sprint A pass out Sprint B.)

- T: Stop! I will read just 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.)

Note: To keep the energy and fun going, do a stretch or a movement game in between Sprints.

Sprint B

(Put Sprint B face down on 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 3 more right on Sprint B than on Sprint A, when I say 3 you sit down. Ready?
- T: (Call out numbers starting with 1. Students sit as the number by which they improved is called.)

An alternate method is to choose three students to tell how many they got correct on Sprint A and Sprint B.

For each set of scores, on your signal, the class chorally says the difference. This provides frequent practice with counting on and other mental strategies, and it reinforces the relationship between addition and subtraction.

- T: Miguel, how many did you get correct on Sprint A and Sprint B?
 S: On Sprint A, I got 12, and on Sprint B I got 17.
 T: How many more did Miguel do on Sprint B than on Sprint A? (Pause.)
 S: 5!

Students may take Sprints home.

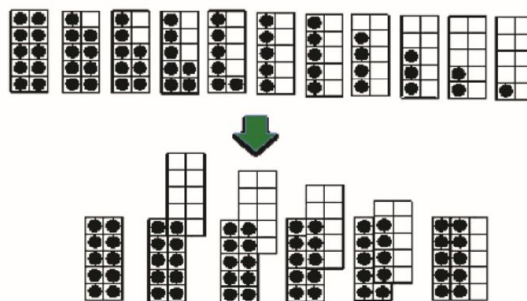
Concept Development (21 minutes)

Materials: (T) Large set of ten-frame cards in the following suggested order: 5, 9, 1, 8, 2, 7, 3, 6, 4, 5, 10
 (S) Mini ten-frame cards that show the numbers 1–10, with an extra card that shows 5 (Template 1), number bond recording sheet (Template 2)

Note: Prior to the lesson, create a set of ten-frame cards 1 through 10 large enough for all students to see for Part 2. These cards will be used throughout the year to review and maintain fluency with the bonds of 10.

Part 1: Make ten.

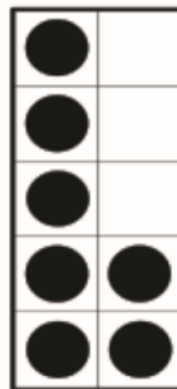
- T: Place your ten-frame cards in order from largest to smallest.
 T: Move your ten-frames that have 5 or fewer dots to make ten (see model at right).
 S: (Move cards, placing the 1 on the 9, etc.)
 T: Now go through your bonds of 10 out loud.
 S: 10 and 0, 9 and 1, 8 and 2, 7 and 3, etc.
 T: Close your eyes and see if you can remember them without looking.
 T: Open your eyes and do it again. Who got better at their number bonds of 10?



Part 2: Ten-Frame Flash: Identify the missing addend to make ten.

Note: This next activity requires students to visualize (for those who still need support) or recall from memory (for those who achieved mastery of partners to 10) the missing addend. It also refreshes their subitizing skills (as students only have a few seconds to recognize the set of 5 and the set of 2 on the image at right as 7) in order to complete the number sentence.

- T: Here is a ten-frame card. Tell me the addition sentence to make ten. Wait for the signal. (Flash a large ten-frame card for about two seconds.)
 S: $7 + 3 = 10$, $5 + 5 = 10$, $9 + 1 = 10$, $8 + 2 = 10$, etc.



- T: This time, tell me the subtraction sentence to get to the number of dots shown. Wait for the signal. (Flash a ten-frame card for about two seconds.)
- S: $10 - 3 = 7$, $10 - 5 = 5$, $10 - 9 = 1$, $10 - 1 = 9$, etc.
- T: Partner A, turn over your ten-frame cards to hide the dots.
1. Show the top card for two seconds.
 2. Wait for Partner B to tell you the addition sentence and subtraction sentence.
 3. Flash the next card.
 4. Keep going until the buzzer sounds after one minute.
- T: (Set the timer for one minute.) Partner B, now it's your turn.
- T: Let's try the class set again. (Repeat the class set. Give verbal praise specific to observed improvement, such as "Students, you really improved at making 10 from 2, 3, and 4, which are usually a greater challenge.")
- T: Partners, talk about how $6 + 4$ helps you solve $10 - 6$.
- T: Now show the number I say with your fingers. Then show the missing part and say the number sentence.
- T: Four.
- S: (Show 4 fingers. Then show 6.) $4 + 6 = 10$.
- T: (Continue quickly through the remaining partners to 10.)



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Post the first few problems of each set on the board so students can identify the pattern. Underline, highlight, or use a different color for the digits in the ones place to draw attention to making a ten.

Part 3: Record number bonds.

Note: Distribute the number bond template and have students write number bonds of 10 without pictures or manipulatives. If they get stuck, invite them to visualize ten-frame cards rather than use them. Close by having partners share their work and look for commonalities.

Once students have written the bonds of 10, briefly continue with addition into teen numbers, numbers to 40, and numbers to 100 as students are able. This adds excitement as students see their sums applying to bigger numbers. Keep a lively pace.

MP.2

- T: $5 + 5$ is...?
- S: 10.
- T: $15 + 5$ is...?
- S: 20.
- T: $25 + 5$ is...?
- S: 30.
- T: $65 + 5$ is...?
- S: 70.

Repeat the process as time allows, possibly using the following sequence: $7 + 3$, $17 + 3$, $27 + 3$, $57 + 3$; $8 + 2$, $28 + 2$, and $48 + 2$.

Problem Set (10 minutes)

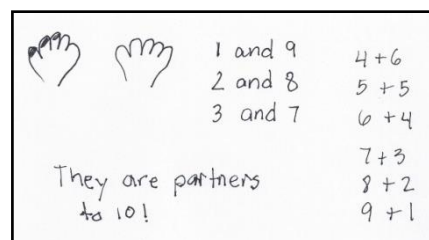
Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the purposeful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Consider assigning incomplete problems for homework or at another time during the day.

Application Problem (10 minutes)

Problem 1

Mrs. Potter paints her fingernails one at a time from left to right. She paints 1 fingernail first. How many fingernails does she have unpainted? If she keeps painting 1 fingernail at a time, how many other combinations of painted and unpainted nails can she have?



Problem 2

The cashier wants each envelope to have exactly 10 bills. How many more bills does he need to put in each of the following envelopes?

- An envelope with 9 bills. (1)
- An envelope with 5 bills. (5)
- An envelope with 1 bill. (9)
- Find other numbers of bills that might be in an envelope and tell how many more bills the cashier needs to put to make 10 bills.

A different cashier wants each envelope to have exactly 30 bills. How many more bills does he need to put in each of the following envelopes?

- An envelope with 28 bills. (2)
- An envelope with 22 bills. (8)
- An envelope with 24 bills. (6)

Note: Choose one or both problems based on the needs of your students and the time constraint of 10 minutes. These problems are designed to elicit connections between the fingernails, envelopes, and ten-frames, which can be explored during the Debrief. Ten minutes have been allotted in order for you to review the Read, Draw, Write (RDW) Process for problem solving.

Directions for the RDW Process: Read the problem, draw and label, write a number sentence, and write a word sentence. The more students participate in reasoning through problems with a systematic approach, the more they internalize those behaviors and thought processes.

(Excerpted from “How to Implement *A Story of Units*.”)

Student Debrief (10 minutes)

Lesson Objective: Make number bonds of ten.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.



You may choose to use any combination of the questions below to lead the discussion.

- Compare the envelope problem to the fingernail problem. What is different about the problems? What is the same about them?
- (Hold up a ten-frame card). Why do you think I chose to use the ten-frame cards today?
- (Hold up the ten-stick of linking cubes with the color change after the fifth cube.) How does the color change at the five help us with learning our bonds of ten?
- Instead of a color change, how does the ten-frame show the five?
- How did the first envelope problem help you solve the second one? How does $6 + 4$ help you solve $26 + 4$?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1: Problem Set 2•1

Name Jessica Date _____

1. Add or subtract. Complete the number bond for each set.

$3 + 7 = 10$  $9 + 1 = 10$ 

$7 + 3 = 10$ $1 + 9 = 10$

$10 - 7 = 3$ $10 - 1 = 9$

$10 - 3 = 7$ $10 - 9 = 1$

2. Circle all the number sentences that are true.

$0 + 10 = 10$ $6 + 3 = 10$

$5 + 5 = 10$ $9 + 1 = 10$

$2 + 9 = 10$ $6 + 4 = 10$

$3 + 7 = 10$ $1 + 10 = 10$

3. Fill in the missing numbers.

$4 + \underline{6} = 10$

$10 - 6 = \underline{4}$

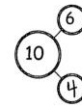
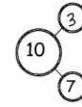
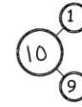
$10 = \underline{4} + 6$

$\underline{10} = 10 - 4$

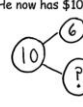
COMMON CORE Lesson 1: Make number bonds of ten. 5/7/13 engage^{ny} 1.A.10

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set 2•1


4. Complete the number bonds.

5. Jim had \$6 in the bank. He found some money on a park bench and put it in the bank. He now has \$10 in the bank. How much money did he find?

 $10 - 6 = 4$
Jim found \$4.

6. Natasha was given some money for her birthday. She spent \$7 on a bow and \$3 on a hair clip. If she used all of her money, how much money was Natasha given? Solve using words, math drawings, or numbers.

 $7 + 3 = 10$
Natasha was given \$10.

COMMON CORE Lesson 1: Make number bonds of ten. 6/24/14 engage^{ny} 1.A.13

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Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Do as many as you can in 60 seconds.

Do as many as you can in 60 seconds.

1	$10 + 1 =$	16	10 and 1 make _____	1	$10 + 3 =$	16	10 and 3 make _____
2	$10 + 2 =$	17	2 more than 10 is ____	2	$10 + 4 =$	17	4 more than 10 is ____
3	$10 + 4 =$	18	10 and 0 make _____	3	$10 + 1 =$	18	10 and 4 make _____
4	$10 + 3 =$	19	10 and 3 make _____	4	$10 + 2 =$	19	10 and 2 make _____
5	$10 + 5 =$	20	10 and 6 make _____	5	$10 + 3 =$	20	10 and 1 make _____
6	$10 + 6 =$	21	1 more than 10 is ____	6	$10 + 4 =$	21	3 more than 10 is ____
7	$10 + 0 =$	22	10 and 4 make _____	7	$10 + 1 =$	22	10 and 4 make _____
8	$10 + 7 =$	23	10 and 5 make _____	8	$10 + 2 =$	23	10 and 2 make _____
9	$10 + 9 =$	24	10 and 9 make _____	9	$10 + 3 =$	24	10 and 8 make _____
10	$10 + 10 =$	25	10 and 6 make _____	10	$10 + 4 =$	25	7 more than 10 is ____
11	$10 + 1 =$	26	6 more than 10 is ____	11	$10 + 1 =$	26	10 and 9 make _____
12	$10 + 3 =$	27	10 and 10 make _____	12	$10 + 2 =$	27	10 and 0 make _____
13	$10 + 4 =$	28	3 more than 10 is ____	13	$10 + 3 =$	28	3 more than 10 is ____
14	$10 + 2 =$	29	10 and 2 make _____	14	$10 + 1 =$	29	10 and 2 make _____
15	$10 + 3 =$	30	2 more than 10 is ____	15	$10 + 2 =$	30	5 more than 10 is ____

Do you know your 10 pluses?

Name _____

Date _____

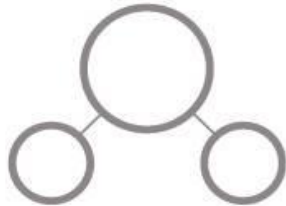
1. Add or subtract. Complete the number bond for each set.

$3 + 7 = \underline{\quad}$

$7 + 3 = \underline{\quad}$

$10 - 7 = \underline{\quad}$

$10 - 3 = \underline{\quad}$

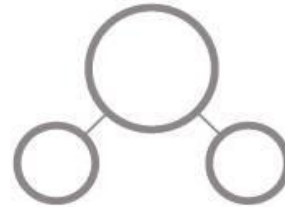


$9 + 1 = \underline{\quad}$

$1 + 9 = \underline{\quad}$

$10 - 1 = \underline{\quad}$

$10 - 9 = \underline{\quad}$



2. Circle all the number sentences that are true.

$0 + 10 = 10$

$6 + 3 = 10$

$5 + 5 = 10$

$9 + 1 = 10$

$2 + 9 = 10$

$6 + 4 = 10$

$3 + 7 = 10$

$1 + 10 = 10$

3. Fill in the missing numbers.

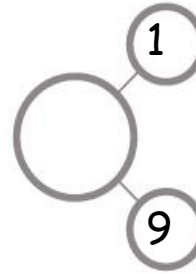
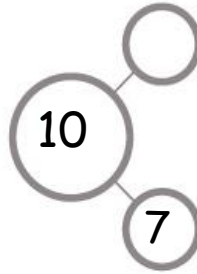
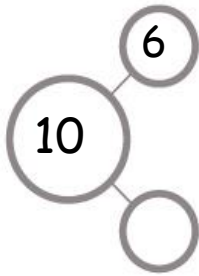
$4 + \underline{\quad} = 10$

$10 - 6 = \underline{\quad}$

$10 = \underline{\quad} + 6$

$\underline{\quad} = 10 - 4$

4. Complete the number bonds.



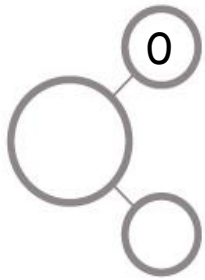
5. Jim had \$6 in the bank. He found some money on a park bench and put it the bank. He now has \$10 in the bank. How much money did he find?

6. Natasha was given some money for her birthday. She spent \$7 on a bow and \$3 on a hair clip. If she used all of her money, how much money was Natasha given? Solve using words, math drawings, or numbers.

Name _____

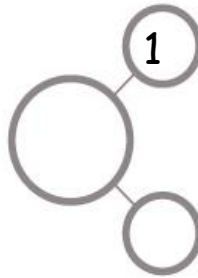
Date _____

Complete each number bond to make 10. Write at least one addition and one subtraction sentence for each bond.



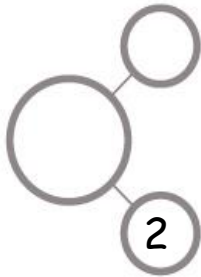
$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$



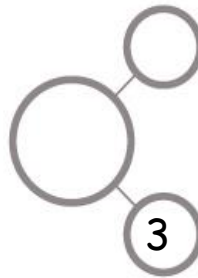
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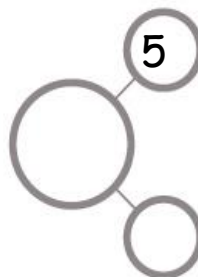
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$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$



$$\underline{\quad} + \underline{\quad} = \underline{\quad}$$

$$\underline{\quad} - \underline{\quad} = \underline{\quad}$$

Name _____

Date _____

1. Circle all the number sentences that are true.

$6 + 4 = 10$

$5 + 5 = 1 + 9$

$10 = 3 + 7$

$2 + 8 = 7 + 3$

$10 - 7 = 4$

$8 - 2 = 10$

2. Add or subtract.

a. $10 - 7 =$ _____

b. $8 + 2 =$ _____

c. $10 - 5 =$ _____

d. $3 + 7 =$ _____

e. $10 - 0 =$ _____

3. Solve the problems.

a. $1 + 9 =$ _____

b. $59 + 1 =$ _____

c. $15 + 5 =$ _____

d. $65 + 5 =$ _____

e. $28 + 2 =$ _____

f. $72 + 8 =$ _____

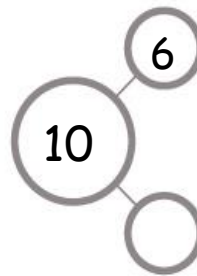
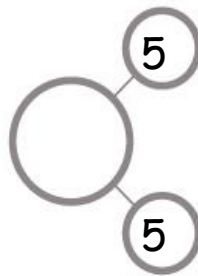
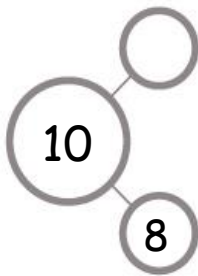
g. $33 + 7 =$ _____

h. $87 + 3 =$ _____

i. $46 + 4 =$ _____

j. $94 + 6 =$ _____

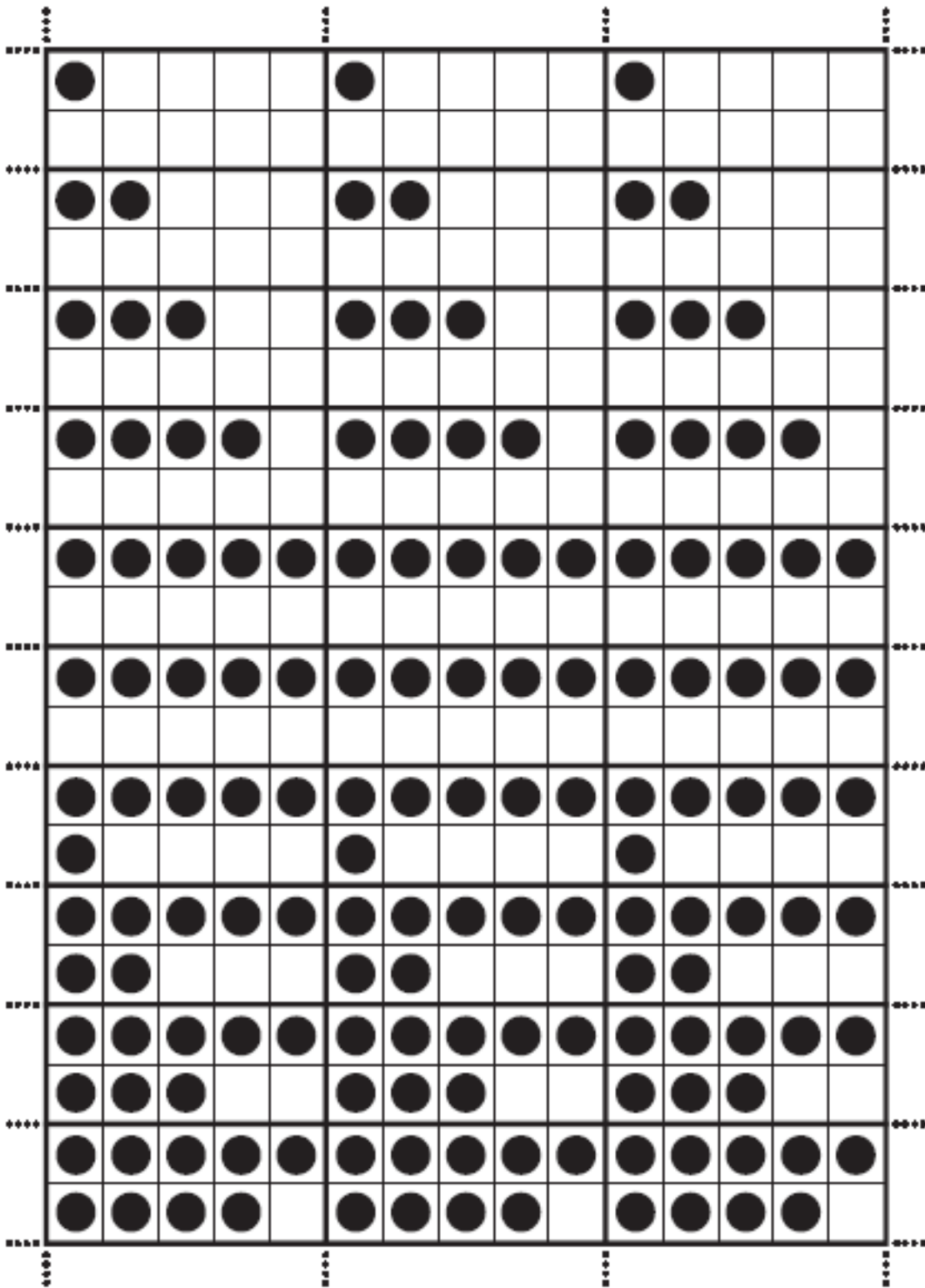
4. Complete the number bonds.



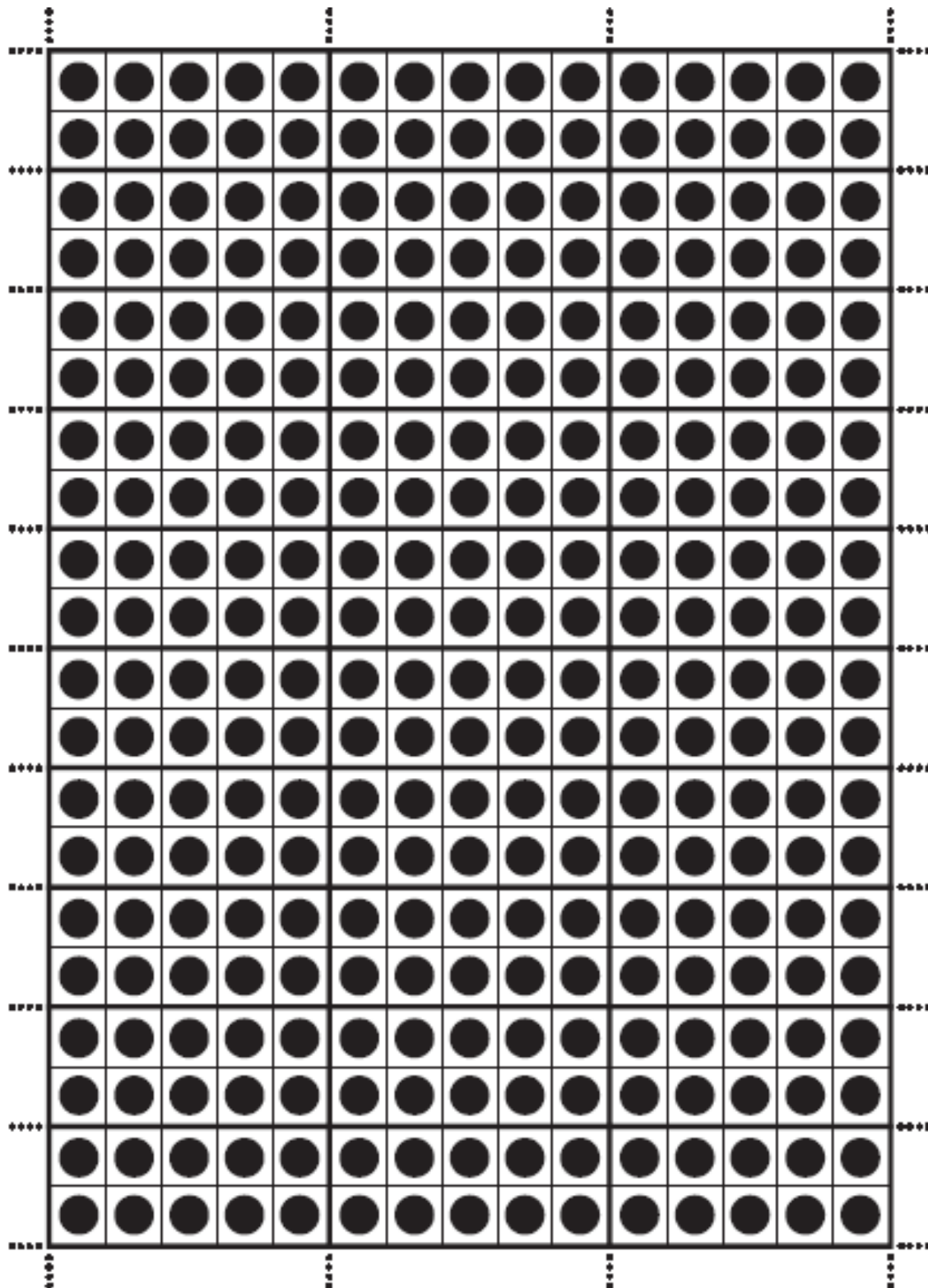
5. Your little brother has \$4. He wants to spend the money on an action figure that costs \$10. How much money does he still need to buy the action figure?

6. Daniel found \$14. His father gave him some more. Then he had \$20. How much money was he given? Write a number sentence to show your thinking.

7. Amy read 24 books. Peter read 30 books. Amy wants to read the same number of books as Peter. Amy thinks she needs to read 7 more books to reach her goal. Is she right? Explain using words, math drawings, or numbers.



mini ten-frame cards

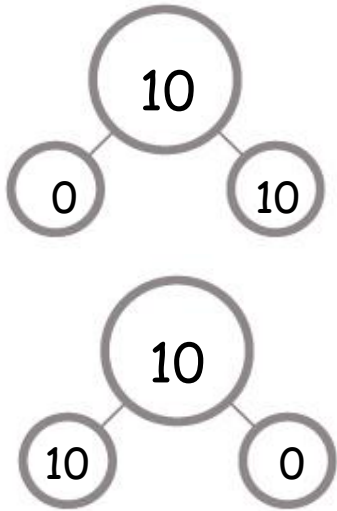


mini ten-frame cards

Name _____

Date _____

Draw all the number bonds of 10. The first one is done for you.



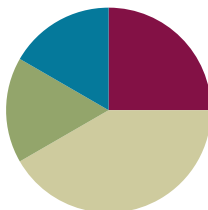
number bond recording sheet

Lesson 2

Objective: Make number bonds through ten with a subtraction focus and apply to one-step word problems.

Suggested Lesson Structure

■ Fluency Practice	(15 minutes)
■ Concept Development	(25 minutes)
■ Application Problem	(10 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (15 minutes)

- Happy Counting 9–25 **2.NBT.2** (2 minutes)
- Say Ten Counting from 5 to 25 **2.NBT.1** (6 minutes)
- Ten Plus Number Sentences **2.OA.2** (3 minutes)
- Make Ten by Identifying the Missing Part **2.OA.2** (4 minutes)

Happy Counting 9–25 (2 minutes)

Note: Students practice fluently crossing the ten on Day 2, meaning they work up and down especially focusing on 8, 9, 10, 11, 12, 11, 10, 9, 8 and 18, 19, 20, 21, 22, 21, 20, 19, 18.

- T: Watch my hand to know whether to count up or down. A closed hand means stop. (Show signals as you explain.)
- T: Let's count by ones starting at zero. Ready? (Rhythmically point up until a change is desired. Show a closed hand then point down. Continue, mixing it up.)
- S: 9, 10, 11, 12, 13, 14 (stop) 13, 12, 11 (stop) 12, 13, 14, 15, 16, 17, 18 (stop) 17, 16, 15, 14 (stop) 15, 16, 17, 18, 19, 20 (stop) 19, 18, 17 (stop) 18, 19, 20, 21, 22, 23 (stop) 22, 21, 20, 19 (stop) 20, 21, 22, 23, 24, 25.
- T: Excellent! Try it for 30 seconds with your partner. Partner B, you are the teacher today.

Say Ten Counting from 5 to 25 (6 minutes)

Note: Research substantiates that unit form counting, or Say Ten counting, supports number sense in that the naming of the numbers reveals the base ten to students. In *A Story of Units* students have been counting this way since Kindergarten.

Hide Zero cards and the Rekenrek (both pictured below) parallel Say Ten counting.

T: The Say Ten way to say 11 is 1 ten 1. (Pull the Hide Zero cards apart to show the 10 and the 1.) In Say Ten counting, we first state the number of tens and then state the number of ones.

T: (Show 12 with place value cards.) 2 more than 10, not in Say Ten way?

S: 12.

T: (Pull cards apart.) The Say Ten way to say 12?

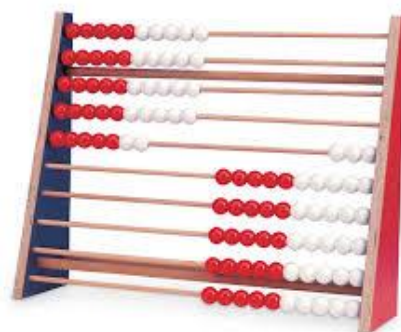
S: 1 ten 2.

T: (Show 13.) What is the Say Ten way for 13?

S: 1 ten 3.

T: (Pull cards apart.) Yes!

T: Let's count the Say Ten way starting from 5 on the Rekenrek. As I move the beads, count aloud.



Beads on the Rekenrek start out pushed to the right. To show 5, a row of 5 are pulled to the left. To show 1 ten 1, a row of ten and a second row of one are pulled to the left, etc.

S: 5, 6, 7, 8, 9, 10, 1 ten 1, 1 ten 2, 1 ten 3, 1 ten 4, 1 ten 5, 1 ten 6, 1 ten 7, 1 ten 8, 1 ten 9.

T: 2 tens (show two rows of ten beads pulled to the left), and the pattern begins again.

S: 2 tens 1, 2 tens 2, 2 tens 3, 2 tens 4, 2 tens 5.

T: Partner B, tell your partner what patterns you noticed as you counted numbers 11–19.

T: Talk with your partner about how Say Ten counting numbers 11–19 relates to counting numbers 20–29.

Ten Plus Number Sentences (3 minutes)

Materials: (T) Large ten-frame cards from Lesson 1, Hide Zero cards (Template 1)

Note: Students should be able to claim proficiency with their ten plus facts. “My ten plus facts are easy! I just know them. $10 + 9$ is 19. See I didn't have to count.” Clearly this then extends into knowing $20 + 9$ and later understanding expanded form without difficulty.

T: I will flash two ten-frame cards, ten and another card. Wait for the signal. Then tell me the addition sentence that combines the numbers. Let's say numbers the regular way.

T: (Flash 10 and 5.)

S: $10 + 5 = 15$.

Continue with the following possible sequence: 10 and 9, 10 and 1, 10 and 3.

T: Let's use Hide Zero cards for larger numbers. (Flash 30 and 5.)

Continue with the following possible sequence: 30 and 8, 70 and 8, and 70 and 7.

T: Talk to your partner about $10 + 8 = 18$, $30 + 8 = 38$, and $70 + 8 = 78$. (Write these facts on the board.) What is the same about these facts? What is different?

- T: Partner A, explain how one problem helps you solve the other.
T: Partner B, explain how Say Ten counting is like ten plus number sentences.

Make Ten by Identifying the Missing Part (4 minutes)

Materials: (S) Personal white boards

Note: Students need this skill as they add 8 and 6 using the ten and subsequently add 18 and 6 or 80 and 60.

- T: If I say 9, you say 1, because 9 needs 1 to be 10.
T: Wait for the signal, 5.
S: 5.

Continue with the following possible sequence: 8, 2, 9, and 1.

- T: This time I'll say a number and you write the addition sentence to make ten on your personal white board.
T: 0. Get ready. Show me your board.
S: $0 + 10 = 10$.
T: 10. Get ready. Show me your board.
S: $10 + 0 = 10$.

Continue with the following possible sequence: 3, 7, 6, and 4.

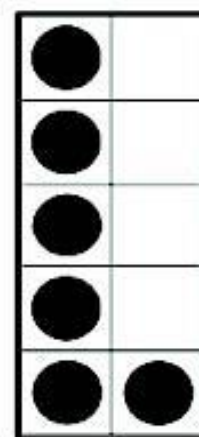
- T: Turn and explain to your partner what pattern you noticed that helped you solve the problems.
S: First, you said 0 and the answer was $0 + 10 = 10$; next, you said 10 and the answer was $10 + 0 = 10$. The numbers switched places!

Concept Development (25 minutes)

Materials: (T) Large ten-frame cards from Lesson 1 (S) Per pair: set of mini ten-frame cards (Lesson 1 Template 1), 10 two-sided counters, blank ten-frame (Template 2), die, piece of blank paper, personal white boards

Note: This lesson builds on the previous lesson as students re-establish their Grade 1 mastery of sums and differences to 10. Students generally build proficiency in addition before subtraction, so today's Concept Development focuses on subtraction facts to address common misconceptions such as writing $2 - 7 = 5$ rather than $7 - 2 = 5$.

- T: Look at the card I'm holding up. (Hold up a large ten-frame card with 6 dots.)
T: How many dots do you see?
S: 6.
T: In your mind, subtract 1. At the signal tell me the subtraction sentence. Wait for my signal.
S: $6 - 1 = 5$.



- T: Good. Let's keep going. As you look at the 6 card, subtract the number I tell you. Wait for the signal. 5. (Signal.)
- S: $6 - 5 = 1$.
- T: Nice work! (Keep going, subtracting 2, 4, 3, and 0 before advancing to the 7 card with a similar sequence.)
- T: (Hold up a ten-frame with 7 dots.) Now how many dots do you see?
- S: 7.
- T: (Continue through the bonds of 7.)
- T: Now practice in pairs using the 8 and 9 cards to quiz each other. Partner A, you start with the 8 card. When I say to switch, Partner B will start quizzing Partner A with the 9 card.
- T: (Pass out materials for the following activity: 10 two-sided counters, a blank ten-frame template, a die, and a blank piece of paper to hide the counters.)
- T: I will tell you the whole amount. Partner B shows the whole using counters on the ten-frame.
- T: If I say that the whole is 7, Partner B shows one color of 7 counters on the ten-frame.
- T: Now, Partner A, roll the die to determine the part to change color. What part did you roll?
- S: 4.
- T: Partner B, hide all the counters from Partner A. Flip 4 counters to the other color.
- T: Partner A, say the subtraction sentence to find the part that didn't change color.
- S: $7 - 4 = 3$. The part that didn't change color is 3!
- T: Partner B, show the counters to prove whether Partner A is correct or incorrect.
- T: Continue playing for 30 seconds. I will then say switch. Exchange materials. As I watch and listen to you work and improve, I will pass you on to the next larger number when you are ready. (Move students on to wholes of 8, 9, 10, and beyond.)

Note: Conduct a short debrief to give students time to reflect and share insights.

- T: There are some problems that you may do more slowly than others. Which ones slow you down?
- S: Subtracting 6 from 9 is hard for me.
- T: Who can share a way they subtract 6 from 9 with the class?
- S: My fives are easy for me. $9 - 5 = 4$, so $9 - 6$ is one less, 3. → I think, 6 plus what is 9? I know that is 3. → I know my tens. $10 - 6 = 4$, so $9 - 6$ is one less. → I know my number pairs. 6 and 3 is 9, so $9 - 6$ is 3.
- T: Partner B, turn and talk to your partner about one strategy you just heard and understood that is different from the one you used. (Pause.) Partner A, take a turn.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Choose one or both Application Problems based on the needs of your students and the time constraint of 15 minutes.

Take care that the connection between the Concept Development and the Application Problems is not made too explicit; the goal is for students to discover these connections: "Oh! This is just ten plus number sentences!" "I can use what I practiced in make 10 to do the apples problem!" Ask questions to probe what students mean and encourage them to articulate their observations, especially during the Debrief when you want the lesson's objective to become eminently clear to the students.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Application Problem (10 minutes)

Problem 1

There are both red and green apples in a bag. (Select a total number of apples as appropriate for your students. Be sure your students are proficient with 7, 8, and 9 before choosing a larger number.) How many red and how many green apples might there be in the bag?

Problem 2

Sherry already has 10 stickers. Now her goal is to collect 20 in all. She got 4 more on Monday and 4 again on Tuesday.

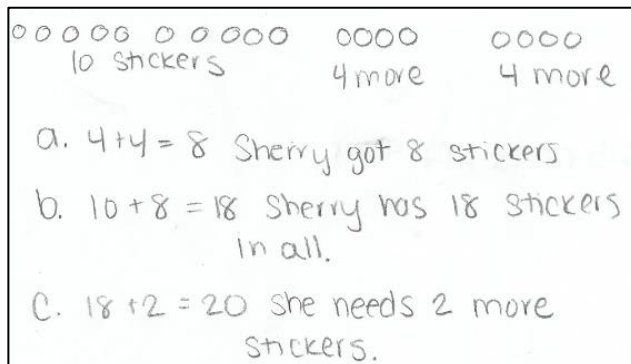
- How many stickers did Sherry get on Monday and Tuesday?
- How many stickers does she have in all?
- How many more stickers does she need to make her goal?

Note: Problem 1 relates to the fingernail problem from G2–M1–Lesson 1. Instruct students to use the RDW procedure (introduced in Lesson 1) and their personal white boards to complete Problem 1. Problem 2 is more challenging, and the goal is for students to do their best within the allotted time, not necessarily to complete all tasks (time-frame rather than task-frame). The two problems create a differentiation opportunity. Those students who grasp the concept can move on, while those who need more practice can work on Problem 1.

Guide students through the problem by rereading it and then drawing and labeling each piece of information as it is given. (Be sure students write the equation and the statement of the answer for each part as it is solved on their personal white boards.) This systematic approach will support students as they work independently on the Problem Set and at home.

T: Let's read Problem 2 together through Part (a).

S: (Read chorally.)



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

As you circulate during this Application Problem, identify a student who uses an efficient representation or strategy. Ask the student to share her work with the class during the Student Debrief. Select work that advances efficient ways of counting and grouping rather than work that shows scattered representations.

- T: Tell your partner what you see when you hear the story.
- S: (Share with partners.)
- T: What can you draw to show Part (a)?
- S: Two groups of 4 stickers which equals 8 stickers.
→ A total of 8 stickers.
- T: What can you draw to show Part (b)?
- S: A page with 10 stickers, and then another page that's getting fuller because she got stickers on Monday and stickers on Tuesday. → 10 stickers and 8 more.
- T: I'll give you two minutes to make your drawing of the story.
- T: Explain to your partner what your drawing shows.
- T: (Wait until a brief exchange is complete.) How many stickers does Sherry have now?
- S: 18.
- T: 18 what? It's important to always state the unit.
- S: 18 stickers.
- T: Turn and tell your partner what number sentence you can write to show your drawing.

Continue through the process of having the students write the number sentence and the statement of the answer.

Student Debrief (10 minutes)

Lesson Objective: Make number bonds through ten with a subtraction focus and apply to one-step word problems.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 2 Problem Set 2•1

Name Raphael Date _____

1. Complete the number bonds.

2. Find the unknown numbers that make the number sentences true.

$9 - 5 = \underline{4}$ $8 - 5 = \underline{3}$

$3 + \underline{5} = 8$ $3 + \underline{4} = 7$

$8 - \underline{4} = 4$ $6 - \underline{3} = 3$

$18 = \underline{8} + 10$ $17 = 7 + \underline{10}$

$\underline{9} - 5 = 4$ $\underline{9} - 6 = 3$

3. Maria put some cups on the table. Jesse put 7 more cups. There were 17 cups in all. How many cups did Maria put on the table? Show your thinking using words, math drawings, or numbers.

Maria 10 cups on the table.

COMMON CORE Lesson 2: Make number bonds through ten with a subtraction focus and apply to one-step word problems. Date: 4/24/14 engage^{ny} 1.A.25

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 2 Problem Set 2•1

4. Fill in the missing numbers.

11 is 10 and 1 13 is 10 and 3

15 is 10 and 5 10 and 9 is 19

10 and 8 is 18 12 is 10 and 2

5. Your older sister says, "3 + 10 is easy. You can hear the answer when you count the Say Ten way." Use the ten-frame cards to show why this strategy works for $10 + 7 = 17$.

6. Maggie had a bag of marbles. There were 5 yellow marbles, 6 white marbles, and 4 blue marbles. How many marbles were there in all? Show your thinking using words, math drawings, or a number sentence.

There were 15 marbles in all.

COMMON CORE Lesson 2: Make number bonds through ten with a subtraction focus and apply to one-step word problems. Date: 4/24/14 engage^{ny} 1.A.25

- (Draw or project selected student work as noted in the UDL box.) Let's look at some work a classmate did on the sticker problem together. What do you see?
- Do you agree? Turn and talk to your partner about why you agree or disagree.
- Look at the first and second columns of Problem 2 on the Problem Set. What connections do you see between the problems in each row?
- In Problem 6 which numbers did you add first? Why?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A quick review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today. Students have three minutes to complete the Exit Ticket. You may read the questions aloud to the students.



NOTES ON USING MP.3 IN A STUDENT DEBRIEF:

In transitioning from the Application Problem to the Student Debrief, anticipate your students needing one minute to organize their materials and find their pre-assigned math partner to come to the rug.

As students organize themselves, quickly project or redraw the student sample you selected, as well as your own solution on the board.

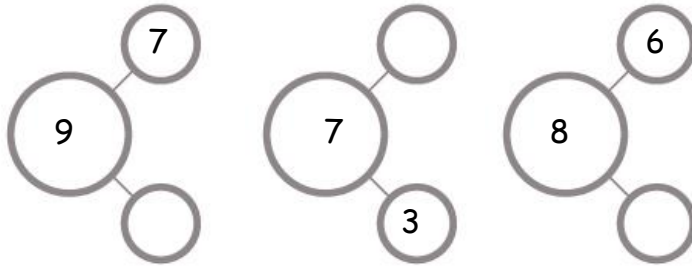
Once students have gathered, wait for 100% attention before beginning. Signal the beginning of the Debrief with a welcoming statement as modeled to the left.

The simple question, "What do you see?" is non-threatening and remarkably effective for eliciting a range of observations and insights that get the conversation started by meeting students where they are. These insights then lead to the opportunity to construct viable arguments and critique the reasoning of others.

Name _____

Date _____

1. Complete the number bonds.



2. Find the unknown numbers that make the number sentences true.

$9 - 5 = \underline{\quad}$

$8 - 5 = \underline{\quad}$

$3 + \underline{\quad} = 8$

$3 + \underline{\quad} = 7$

$8 - \underline{\quad} = 4$

$6 - \underline{\quad} = 3$

$18 = \underline{\quad} + 10$

$17 = 7 + \underline{\quad}$

$\underline{\quad} - 5 = 4$

$\underline{\quad} - 6 = 3$

3. Maria put some cups on the table. Jesse put 7 more cups. There were 17 cups in all. How many cups did Maria put on the table? Show your thinking using words, math drawings, or numbers.

4. Fill in the missing numbers.

11 is _____ and 1

13 is _____ and 3

15 is 10 and _____

10 and _____ is 19

10 and 8 is _____

12 is 10 and _____

5. Your older sister says, "3 + 10 is easy. You can hear the answer when you count the Say Ten way." Use the ten-frame cards to show why this strategy works for $10 + 7 = 17$.

6. Maggie had a bag of marbles. There were 5 yellow marbles, 6 white marbles, and 4 blue marbles. How many marbles were there in all? Show your thinking using words, math drawings, or a number sentence.

Name _____

Date _____

1. Find the unknown numbers that make the number sentences true.

$$7 - 4 = \underline{\quad}$$

$$2 + \underline{\quad} = 8$$

$$6 = 9 - \underline{\quad}$$

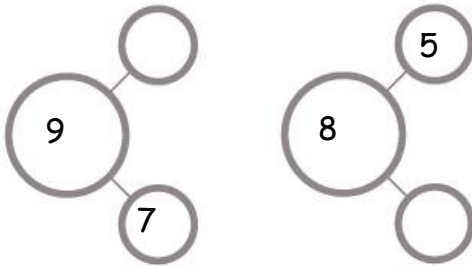
2. Mr. Gardener has a box with 12 tomatoes. He gives 2 tomatoes to his sister and another 7 tomatoes to his neighbor. How many tomatoes does he have left? Show your work with a picture and a number sentence.

Mr. Gardener has _____ tomatoes left.

Name _____

Date _____

1. Complete the number bonds.



2. Find the unknown numbers that make the number sentences true.

$7 - 5 = \underline{\quad}$

$9 - 5 = \underline{\quad}$

$4 + \underline{\quad} = 8$

$10 = 7 + \underline{\quad}$

$8 - \underline{\quad} = 3$

$7 - \underline{\quad} = 3$

$17 = \underline{\quad} + 10$

$6 = 5 + \underline{\quad}$

$\underline{\quad} - 5 = 3$

$\underline{\quad} - 6 = 3$

3. Find the unknown numbers that make the number sentences true.

$\underline{\quad} = 8 + 10$

$\underline{\quad} = 7 - 2$

$\underline{\quad} = 10 - 5$

$\underline{\quad} = 10 + 4$

$\underline{\quad} = 10 + 9$

$\underline{\quad} = 3 + 6$

4. Find the unknown numbers that make the number sentences true.

16 is _____ and 6

11 is 10 and _____

18 is _____ and 10

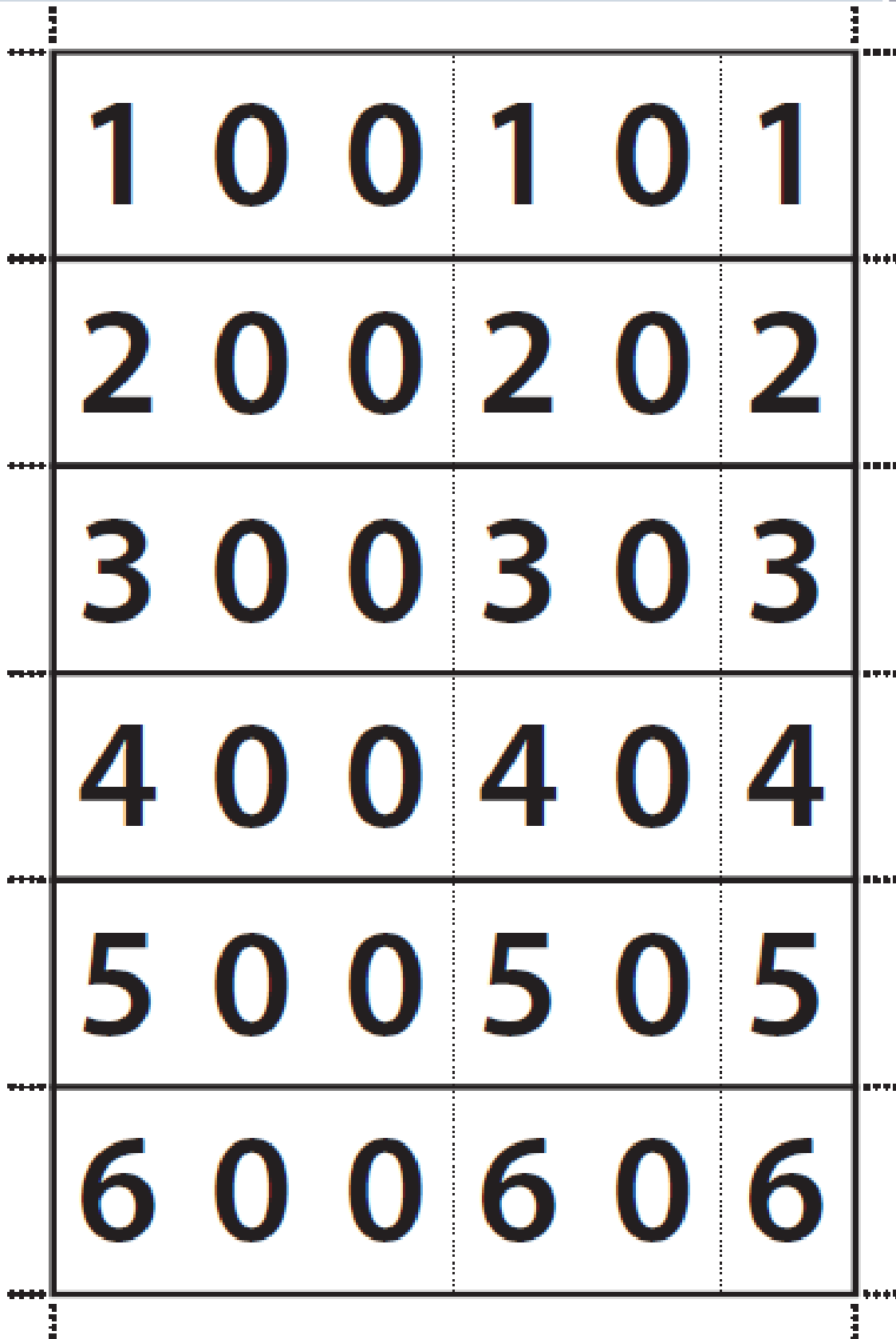
10 and 7 is _____

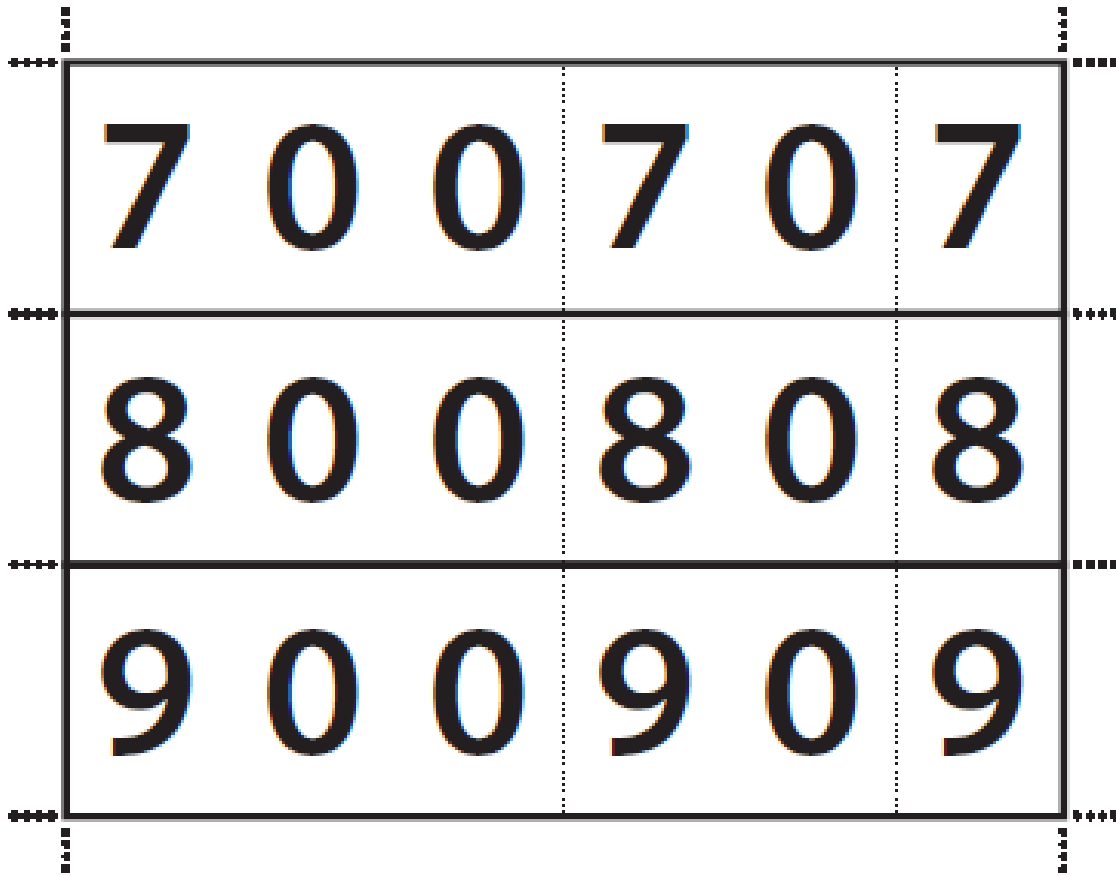
15 is _____ ten _____ ones

10 and _____ is 19

5. Mr. Avakian put a stack of 10 plates on the table for a party. He also put out 8 plates of food. How many plates were there in all on the table? Show your thinking using words, math drawings, or a number sentence.

6. Mr. Passerini gave out 10 vanilla, 2 chocolate, and 8 strawberry ice cream cones. How many ice cream cones did he hand out in all? Show your thinking using words, math drawings, or a number sentence.





hide zero cards

blank ten-frame



Topic B

Mental Strategies for Addition and Subtraction Within 20

2.OA.1, 2.OA.2

Focus Standard:	2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of grade 2, know from memory all sums of two one-digit numbers.
Instructional Days:	3	
Coherence	-Links from: G1–M2	Introduction to Place Value Through Addition and Subtraction Within 20
	-Links to: G2–M4	Addition and Subtraction Within 200 with Word Problems to 100
	G3–M2	Place Value and Problem Solving with Units of Measure

Now that students have practiced their Kindergarten and Grade 1 skills, they are ready to become more fluent with addition problems such as $8 + 7$ and $5 + 9$, where they must cross the ten. In Lesson 3, students make use of the ten-frame structure as they complete the unit of ten and add on the leftover ones. Students proceed to pictorial and abstract representations to demonstrate their understanding of separating the ten out from the ones, as in $8 + 4 = 12$ (shown at right).

In Lesson 4, students add and subtract in the ones place within the teens. This sharpens their skill of separating the ten from the ones and applying their knowledge of sums and differences to 10 to the teen numbers (e.g., $13 + 2 = (10 + 3) + 2 = 10 + (3 + 2)$). In this lesson, students also remember they can use a basic fact to subtract from the ones place when there are enough ones (e.g., $5 - 3 = 2$ so $15 - 3 = 12$). This understanding leads directly to Lesson 5, where students make the decision to subtract from 10 when there are not enough ones (e.g., $12 - 4$, $13 - 5$). Students subtract from ten when they solve a variety of one-step word problem types (2.OA.1). Subtraction from 10 is a strategy that a Grade 2 student uses to solve $12 - 8$ and similar problems, by taking 8 from the 10 in 12. More importantly, this strategy lays the foundation for understanding place value and our unitary system. Students must determine if there are enough ones to subtract or if they must take the number from ten, thus paving the way for recomposing units when using a written method in Modules 4 and 5.

A Teaching Sequence Towards Mastery of Mental Strategies for Addition and Subtraction Within 20

Objective 1: Make a ten to add within 20.
(Lesson 3)

Objective 2: Make a ten to add and subtract within 20.
(Lesson 4)

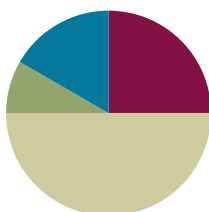
Objective 3: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems.
(Lesson 5)

Lesson 3

Objective: Make a ten to add within 20.

Suggested Lesson Structure

■ Fluency Practice	(15 minutes)
■ Concept Development	(30 minutes)
■ Application Problem	(5 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (15 minutes)

- Break Apart and Put Together by Place Value **2.OA.2** (2 minutes)
- Take Out a Part: Numbers Within Ten **2.OA.2** (2 minutes)
- Pairs to Make Ten with Number Sentences **2.OA.2** (2 minutes)
- Sprint: One More, Ten More **2.OA.2** (9 minutes)

Break Apart and Put Together by Place Value (2 minutes)

Note: Students remember the relevance of their ten plus facts to larger numbers.

T: When I say $10 + 5$, you say 15. Ready?

T: $10 + 5$.

S: 15.

T: $10 + 2$.

S: 12.

Continue with the following possible sequence: $10 + 9$, $10 + 4$, $20 + 4$, $50 + 4$, $30 + 8$, and $70 + 8$.

T: How are $10 + 4$ and $50 + 4$ the same? How are they different?

T: How is knowing that helpful?

S: (Share.)

T: Now, when I say 13, you say $10 + 3$.

T: 13.

S: $10 + 3$.

Continue with the following possible sequence: 17, 11, 16, 18, 28, 78, 14, 34, and 94.

Take Out a Part: Numbers Within Ten (2 minutes)

Note: Taking out 1 prepares students for adding 9. The students make a ten, adding 9 and 6 by adding 9 and 1 and 5. Taking out 2 prepares students for adding 8. The students make a ten, adding 8 and 6 by adding 8 and 2 and 4.

T: Let's take out 1 from each number. I say 5. You say $1 + 4$.

T: 5. Get ready.

S: $1 + 4$.

T: Now, let's take out 2. If I say 6, you say $2 + 4$.

T: 3.

S: $2 + 1$.

Continue with the following possible sequence: 5, 10, 4, 7, 9, 8, and 6.

Pairs to Make Ten with Number Sentences (2 minutes)

Materials: (S) Personal white boards

Note: This is a foundational skill for mastery of sums and differences to 20.

T: I'll say a number and you write the addition sentence to make 10 on your personal white board.

T: 5. Get ready. Show me your board.

S: (Show $5 + 5 = 10$.)

T: 8. Get ready. Show me your board.

S: (Show $8 + 2 = 10$.)

Continue with the following possible sequence: 9, 1, 0, 10, 6, 4, 7, and 3.

T: What pattern did you notice that helped you solve the problems?

S: You can just switch the numbers around! → If you say 8 and the answer is $8 + 2 = 10$, then I know that when you say 2 the answer will be $2 + 8 = 10$. → The numbers can switch places!

Sprint: One More, Ten More (9 minutes)

Note: In order to be flexible with adding and subtracting one unit, students first work with 1 more and 10 more.

Materials: (S) One More, Ten More Sprint

**NOTES ON
MULTIPLE MEANS OF
ACTION AND
EXPRESSION:**

Some students may require extended time for Sprints:

- Create a differentiated Sprint for students whose IEPs warrant extra time by eliminating the last five problems.
- Extend time for the task based on individual student needs.
- Focus on goals for accomplishment within a time frame.
- Give students the opportunity to practice the Sprint beforehand at home to help them remain calm and confident during the timed task.

Concept Development (30 minutes)

Materials: (T) Two-sided counters (S) Personal white boards, blank paper, ten-frame cards for numbers 8, 9, and 10 (Template), small bag of two-sided counters

Part 1: Making ten from a large common addend (e.g., solving $9 + 4$, $9 + 5$, $8 + 4$, $8 + 5$).

Note: Two-sided counters can be any available objects that allow students to see two distinct parts (e.g., linking cubes, spray painted beans, two-color counters). Call students to the carpet and as you move the counters, leave them as shown below so that students can compare solutions.

T: (Present 9 counters in one set and 4 in another set directly to the right, as shown below.)

T: How many are here (signaling the set of 9)?

S: 9.

T: How many are here (signaling the set of 4)?

S: 4.

T: (Move a counter from the 4 to complete the ten.)

T: (Point to the new ten.) How many are here?

S: 10.

T: (Point to the 3 counters.) How many are here?

S: 3.

T: Give an expression that combines these 2 sets?

S: $10 + 3$.

T: That's right. You probably remember from first grade that when you just say $10 + 3$ without saying what it equals, we call it an expression. It's not a full number sentence.

T: Now, give the addition number sentence.

S: $10 + 3 = 13$.

T: (Move the 1 back to the original set of 4.)

T: What addition sentence combines these two sets?

S: $9 + 4 = 13$.

T: (Repeat the process immediately with $9 + 5$.)

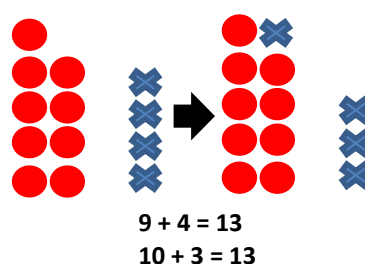
T: Turn and talk to your partner to compare $9 + 4$ and $9 + 5$. (The goal is for students to look for and make use of structure as they complete the unit of ten and add on the ones that are left over.)

S: Both number sentences start with 9. → I gave 1 to the 9 to make 10. → For both problems you can make a ten and just add the extra ones.

T: (After the students have analyzed the problems, numerically record the make ten solutions using the number sentences and bonds shown above.)

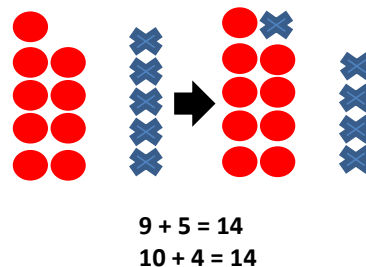
T: On your personal white boards, draw 8 circles in a ten-frame format.

S: (Draw 8 circles, as shown right.)



$9 + 4 = 13$	
/ \	
1	3

$9 + 5 = 14$	
/ \	
1	4



T: Draw 4 crosses by completing the ten first. Draw the extras to the right.

S: (Draw 4 crosses, as shown right.)

T: How much more does 8 need to make 10?

S: 2 more.

T: And, how many are remaining to add to 10?

S: 2.

T: $8 + 4$ is...?

S: 12.

T: $10 + 2$ is...?

S: 12.

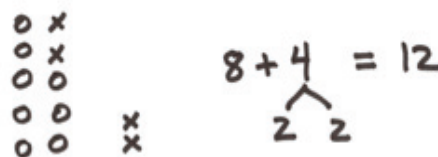
T: Record the make ten solution to $8 + 4$ with number bonds to show that you broke 4 into 2 and 2 to make ten.

T: (Continue with $8 + 5$.)

T: Show your work to your partner and tell what you notice about adding to 8.

T: (Wait for students to respond.) Do you remember what you noticed about adding to 9? How are $9 + 4$ and $8 + 4$ the same and different? Use your linking cubes or your drawing to explain.

S: You have to make 10 with both. → We used 2 to make 10 when we added to 8, and 1 to make 10 when we added to 9. → We bonded 4 as 2 and 2 and 2 and 2.



MP.7

The pencil and paper work below might follow directly after students have engaged with the teacher by working on their personal white boards solving $8 + 4$ and $8 + 5$.

Freddy

		$9 + 6 = 15$ $1 \quad 5$ $10 + 5 = 15$	$8 + 6 = 14$ $2 \quad 4$ $10 + 4 = 14$
		$9 + 7 = 16$ $1 \quad 6$ $10 + 6 = 16$	$8 + 7 = 15$ $2 \quad 5$ $10 + 5 = 15$
		$9 + 8 = 17$ $1 \quad 7$ $10 + 7 = 17$	$8 + 8 = 16$ $2 \quad 6$ $10 + 6 = 16$
		$9 + 9 = 18$ $1 \quad 8$ $10 + 8 = 18$	$8 + 9 = 17$ $2 \quad 7$ $10 + 7 = 17$

$9 + 4 = 13$ $1 \quad 3$ $10 + 3 = 13$	$9 + 5 = 14$ $1 \quad 4$ $10 + 4 = 14$
--	--

T: I don't want you to always need to draw as you solve these problems. Fold your paper so that you are only looking at the number sentences of $9 + 4$ and $9 + 5$. (Pause as students do so.)

T: Looking only at the number sentences, talk to your partner about the meaning of each number.

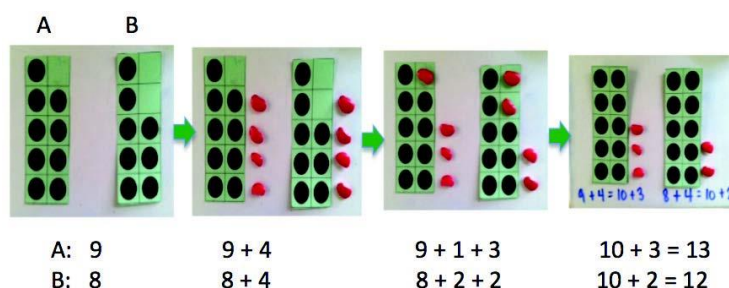
What does 9 refer to as you remember the picture? 4? The bond of 1 and 3? The 13? $10 + 3$?

T: Now look at your list of nines facts. Do you notice a pattern that will help you get better at remembering these sums quickly? (The sums increase by one.)

Part 2: Making ten when the smaller addend is the same.

Note: Give students lots of practice with sets of problems having a common addend, which helps them see relationships.

Directions: Pass out ten-frame cards and counters. Students model $9 + 4$ and then $8 + 4$ by making a ten. In the final frame of the sample sequence below, students cover $9 + 1$ and $8 + 2$ with a ten-frame card, clearly showing the $10 +$ fact within $9 + 4$ and $8 + 4$. Students write the equivalent statements: $9 + 4 = 10 + 3$ and $8 + 4 = 10 + 2$.



When finished with several sets of problems, students discuss with a partner how the problems within a set are the same and different.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Application Problem (5 minutes)

Ben collects dimes. He does it by first collecting pennies and then trading his parents 10 pennies for 1 dime. Ben has 8 pennies. He finds 4 more pennies.

- How many pennies does Ben have before he trades?
- How many pennies does Ben have after he trades?
- How many more pennies will Ben need before he can trade for another dime?

$8 + 4 = 10 + 2$
 a. Ben has 12 pennies.
 b. Ben has 2 extra pennies
 c. $2 + 8 = 10$ Ben needs 8 more pennies.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

In Part 2, students use the ten-frame model to reason about making 10 to add to the teens. Using the language of MP.2, “they pause to probe the referents” (i.e., ten-frames) “to relate them to the symbols involved” (numbers).

- Invite students to use models to calculate and explain their reasoning (e.g., $8 + 4$ and $9 + 4$ with counters, or circles and crosses).
- Draw attention to the meaning of the quantities (8 needs 2 to be 10, etc.).
- Ask questions that require students to make connections between numbers (associating the 8 with the 2) and operations (e.g., $8 + \underline{\quad} = 10$, $10 - \underline{\quad} = 8$).

Note: This problem allows students to apply today's concept of make a ten to add within 20 in a real world context. Five minutes have been allotted for this time-frame task.

Student Debrief (10 minutes)

Lesson Objective: Make a ten to add within 20.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Let's look at page one of your Problem Set. How are $8 + 3$ and $10 + 1$ related?
- Talk to your partner about how we can explain that relationship using a drawing.
- How can you relate $19 + 5$ and $20 + 4$ to $9 + 5$ and $10 + 4$?
- What would be another set of problems to relate to $9 + 5$ and $10 + 4$?
- Talk to your partner about what you think our lesson's focus is today.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 3 Problem Set 2•1

Name: Steven Date: _____

1. Record make ten solutions with number bonds to solve the number sentences. Connect each number sentence with the fact that shows how you added a ten and some ones to solve. The first one is done for you.

COMMON CORE Lesson 3: Make a ten to add within 20. Date: 4/23/14 engage^{ny} 1.B.10

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 3 Problem Set 2•1

2. Fill in the blank to make the sentence true.

a. $5 + \underline{10} = 15$
 b. $4 + \underline{11} = 15$
 c. $\underline{7} + 9 = 16$
 d. $9 + 7 = \underline{16}$
 e. $\underline{9} + 4 = 10 + 3$
 f. $6 + \underline{8} = 10 + 4$

3. Margaret went to camp for 8 hours on Saturday and 4 hours on Sunday. Sandra went to camp for 6 hours on Saturday and 5 hours on Sunday.

a. How many hours did Margaret spend at camp?
 $8 + 4 = 12$
 $10 + 2 = 12$
 Margaret spent 12 hours at camp.

b. How many hours did Sandra spend at camp?
 $6 + 5 = 11$
 $10 + 1 = 11$
 Sandra spent 11 hours at camp.

4. Draw to explain how to add 9 and 4 by making ten.

$9 + 4 = 13$
 $10 + 3 = 13$

COMMON CORE Lesson 3: Make a ten to add within 20. Date: 4/23/14 engage^{ny} 1.B.11

A. Do as many as you can in 60 seconds.

B. Do as many as you can in 60 seconds.

1	1 more than 4 is	16	$2 + 10 =$	1	1 more than 4 is	16	$2 + 10 =$
2	10 more than 4 is	17	1 more than 5 is	2	10 more than 4 is	17	1 more than 5 is
3	$4 + 1 =$	18	10 more than 5 is	3	$4 + 1 =$	18	10 more than 5 is
4	$4 + 10 =$	19	$5 + 1 =$	4	$4 + 10 =$	19	$5 + 1 =$
5	1 more than 1 is	20	$5 + 10 =$	5	1 more than 1 is	20	$5 + 10 =$
6	10 more than 1 is	21	1 more than 6 is	6	10 more than 1 is	21	1 more than 6 is
7	$1 + 1 =$	22	10 more than 6 is	7	$1 + 1 =$	22	10 more than 6 is
8	$1 + 10 =$	23	$6 + 1 =$	8	$1 + 10 =$	23	$6 + 1 =$
9	1 more than 3 is	24	$6 + 10 =$	9	1 more than 3 is	24	$6 + 10 =$
10	10 more than 3 is	25	1 more than 8 is	10	10 more than 3 is	25	1 more than 8 is
11	$3 + 1 =$	26	10 more than 8 is	11	$3 + 1 =$	26	10 more than 8 is
12	$3 + 10 =$	27	$8 + 1 =$	12	$3 + 10 =$	27	$8 + 1 =$
13	1 more than 2 is	28	$8 + 10 =$	13	1 more than 2 is	28	$8 + 10 =$
14	10 more than 2 is	29	1 more than 7 is	14	10 more than 2 is	29	1 more than 7 is
15	$2 + 1 =$	30	$7 + 10 =$	15	$2 + 1 =$	30	$7 + 10 =$

Name _____

Date _____

1. Record make ten solutions with number bonds to solve the number sentences. Connect each number sentence with the fact that shows how you added a ten and some ones to solve. The first one is done for you.

$$\begin{array}{c} 8 + 3 = 11 \\ \wedge \\ 2 \quad 1 \end{array}$$

$10 + 4$

$8 + 6 = \underline{\quad}$

$10 + 3$

$9 + 4 = \underline{\quad}$

$10 + 1$

$6 + 5 = \underline{\quad}$

$10 + 2$

$8 + 8 = \underline{\quad}$

$10 + 1$

$5 + 7 = \underline{\quad}$

$10 + 6$

2. Fill in the blank to make the sentence true.

a. $5 + \underline{\hspace{2cm}} = 15$

b. $4 + \underline{\hspace{2cm}} = 15$

c. $\underline{\hspace{2cm}} + 9 = 16$

d. $9 + 7 = \underline{\hspace{2cm}}$

e. $\underline{\hspace{2cm}} + 4 = 10 + 3$

f. $6 + \underline{\hspace{2cm}} = 10 + 4$

3. Margaret went to camp for 8 hours on Saturday and 4 hours on Sunday. Sandra went to camp for 6 hours on Saturday and 5 hours on Sunday.

a. How many hours did Margaret spend at camp?

b. How many hours did Sandra spend at camp?

4. Make a drawing to explain how to add 9 and 4 by making ten.

Name _____

Date _____

1. Make a drawing to explain $8 + 6 = 10 + 4$.

2. Fill in the blank to make the sentence true.

a. $9 + 7 = \underline{\quad} + 6$

b. $\underline{\quad} + 3 = 10 + 2$

c. $7 + \underline{\quad} = 10 + 1$

Name _____

Date _____

1. Record make ten solutions with number bonds to solve the number sentences. Connect each number sentence with the fact that shows how you added a ten and some ones to solve. The first one is done for you.

$9 + 4 = \underline{13}$

 \wedge
1 3

$10 + 4$

$7 + 6 = \underline{\quad}$

$10 + 3$

$6 + 6 = \underline{\quad}$

$10 + 3$

$7 + 9 = \underline{\quad}$

$10 + 2$

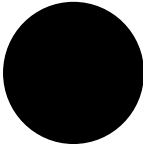
$6 + 8 = \underline{\quad}$

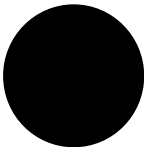
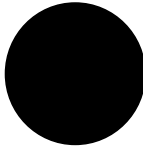
$10 + 6$

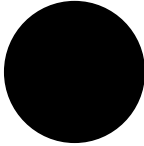
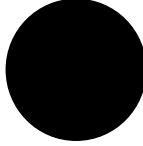
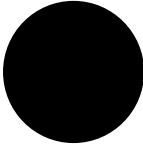
$7 + 7 = \underline{\quad}$

$10 + 4$

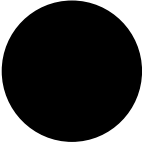
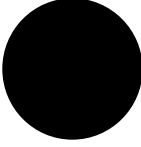
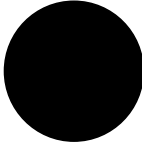
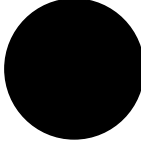
2. Jennifer has 9 markers at school and 6 at home. Orlando has 7 markers at school and 8 at home.
- How many markers does Jennifer have?
 - How many markers does Orlando have?
3. Fill in the blank to make the sentence true.
- $9 + 5 = \underline{\hspace{1cm}} + 4$
 - $4 + 8 = 10 + \underline{\hspace{1cm}}$
 - $8 + \underline{\hspace{1cm}} = 10 + 5$
 - $\underline{\hspace{1cm}} + 5 = 10 + 2$
4. Two teams are playing a baseball game. Team Tigers has 9 players on the field and 4 players on the bench. Team Lions has 9 players on the field and 7 players on the bench.
- How many players does Team Tigers have?
 - How many players does Team Lions have?
5. Draw to explain how to add 7 and 6 by making ten.

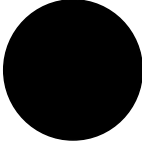
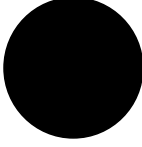
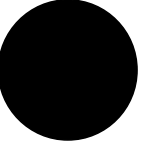
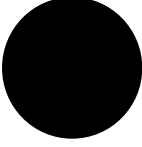
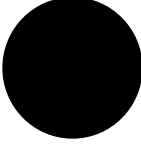
				

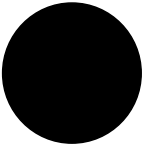
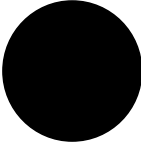
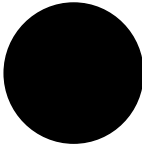
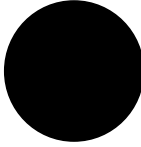
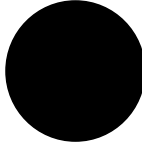
				

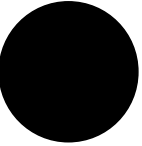
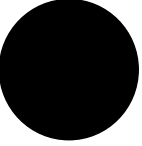
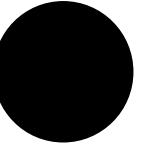
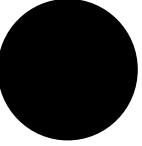
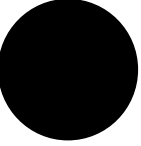
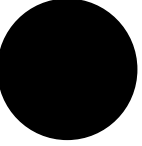
				

ten-frame cards

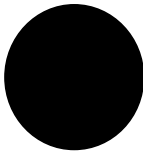
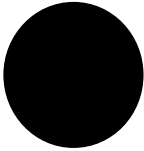
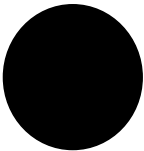
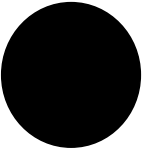
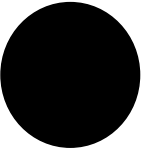
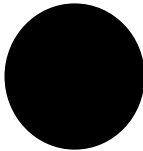
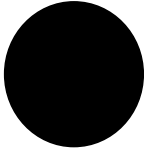
				

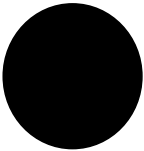
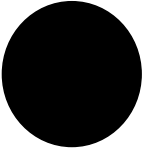
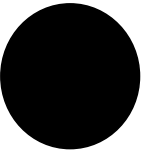
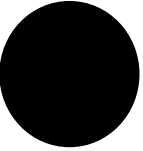
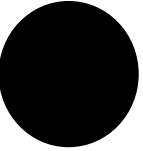
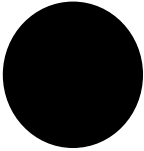
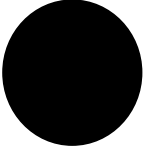
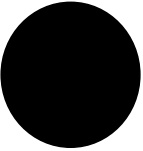
				

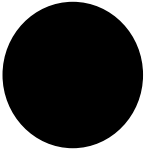
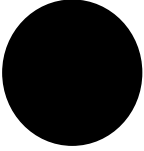
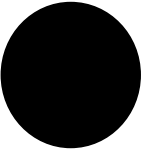
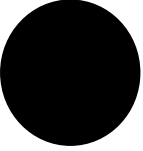
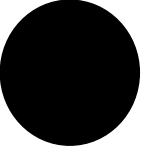
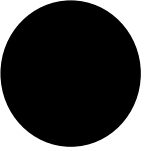
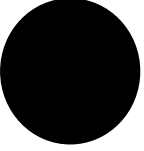
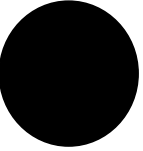
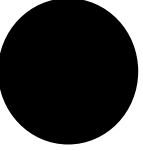
				

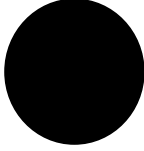
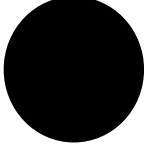
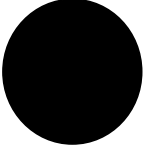
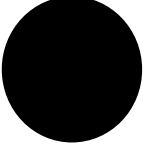
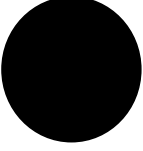
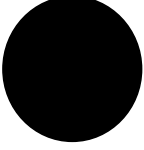
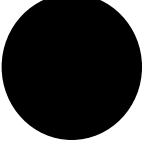
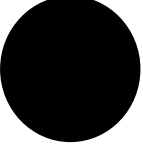
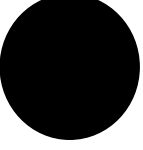
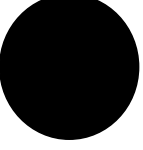
				
				

ten-frame cards

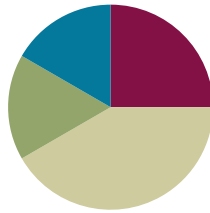
ten-frame cards

Lesson 4

Objective: Make a ten to add and subtract within 20.

Suggested Lesson Structure

■ Fluency Practice	(15 minutes)
■ Concept Development	(25 minutes)
■ Application Problem	(10 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (15 minutes)

- Take from Ten **2.OA.2** (5 minutes)
- Make a Ten to Add **2.OA.2** (6 minutes)
- Say Ten Counting from 25 to 9 **2.NBT.1** (4 minutes)

Take from Ten (5 minutes)

Materials: (S) Personal white boards

Note: Take from Ten develops the automaticity necessary to subtract fluently from the ten when subtracting from the teens.

T: When I say 1, you say 9, because the game is to take the number I say from 10. Ready? 2.

S: 8.

Continue with the following sequence: 3, 6, 5, and 9.

T: This time, after you say how many are left, write the number sentence on your personal white board. 5.

S: 5.

S: (Write the number sentence on their boards.)

T: Show the number sentence.

S: (Show $10 - 5 = 5$.)

Continue with the following possible sequence: 7, 8, 6, 9, and 4.

Make a Ten to Add (6 minutes)

Note: Reviewing making ten allows students to add within the teens during the lesson and see the distinction.

T: Let's make ten to add. I say $9 + 2$, and you say $9 + 2 = 10 + 1$. Ready? $9 + 2$.

S: $9 + 2 = 10 + 1$.

T: Answer?

S: 11.

T: $9 + 5$.

S: $9 + 5 = 10 + 4$

T: Answer?

S: 14.

Continue with the following possible sequence: $9 + 7$; $9 + 6$; $9 + 8$; $8 + 3$; $8 + 7$; $7 + 4$; and $7 + 6$.

Say Ten Counting from 25 to 9 (4 minutes)

Materials: (T) Hide Zero cards (Lesson 2 Template 1), Rekenrek

Note: Today's lesson involves using basic sums and differences within ten to solve problems in the teens that do not cross the ten. This relies on a solid grasp of the structure of ten.

T: (Show 12 with Hide Zero cards.) 2 more than 10, not in Say Ten way?

S: 12.

T: (Pull cards apart.) The Say Ten way to say 12?

S: 1 ten 2.

T: (Show 13.) What is the Say Ten way for 13?

S: 1 ten 3.

T: (Pull cards apart.) That's right!

T: Let's count the Say Ten way starting from 25 on the Rekenrek. As I move the beads, count aloud. What is the Say Ten way for 25?

S: 2 tens 5.

Show 25 with beads pulled to the left on the Rekenrek.

S: 2 tens 5, 2 tens 4, 2 tens 3, 2 tens 2, 2 tens 1, 2 tens, 1 ten 9, 1 ten 8, 1 ten 7, 1 ten 6, 1 ten 5, 1 ten 4, 1 ten 3, 1 ten 2, 1 ten 1, 1 ten, 9.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Support oral responses for Make a Ten to Add by providing personal white boards and ten-frames to students as needed. Draw a ten-frame on the board so students can visualize the ten being made.

O	O	O	O	O
O	O	O	O	X

X

$$9 + 2 = 10 + 1$$



Concept Development (25 minutes)

Materials: (T) Two-sided counters and a ten-frame card showing 10 (Lesson 3 Template)
(S) 1-ten-strip (Template) and 10 two-sided counters per student

Note: Two-sided counters can be any available objects that allow students to see two distinct parts (e.g., linking cubes in two different colors, spray painted beans, two-color counters). Prior to the lesson, cut out 1 ten-strip per student from the template.

Part 1: Adding within the teens.

Present three counters in one set and two in another directly to the right.

T: What addition sentence combines these two sets?

S: $3 + 2 = 5$.

Place a ten-frame card next to the three ones.

T: What is $10 + 3 + 2$?

S: 15.

T: What is $13 + 2$?

S: 15.

T: (Move the ten-frame card next to the 2.)
What is $3 + 10 + 2$?

S: 15.

T: What is $3 + 12$?

S: 15.

T: (Write $13 + 2 = 15$ and $3 + 12 = 15$.) Discuss with your partner why these addition sentences have the same answer. Use our model to help you.

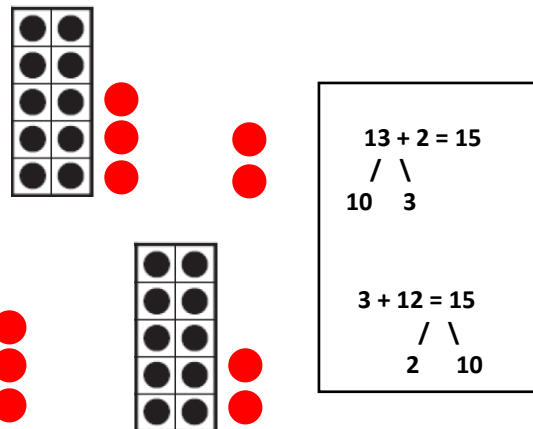
S: Both are equal to $10 + 5$. → Both used the same basic fact in the ones, $3 + 2 = 5$.

T: Discuss with your partner what our friend might mean by *basic fact*.

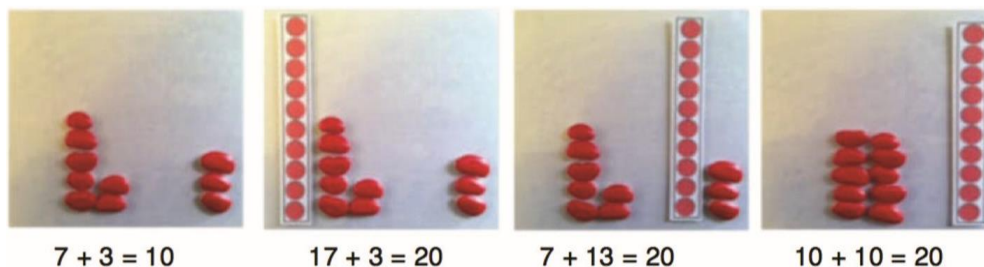
S: We learned $3 + 2$ in Kindergarten so it's basic. → We already know how to do it. → Yeah, but it helps us solve other problems.

T: Yes! Even fourth-grade problems like 3 sevenths + 2 sevenths! Or, 3 million + 2 million.

T: (Pass out ten-strips and two-sided counters.)



Have students work in pairs. Both show $7 + 3$. Then Partner A models $17 + 3$ and Partner B models $7 + 13$ (see picture below). As students recognize that the ones equal 10, move on to paper and pencil work.



- T: Talk with your partner and compare $13 + 7 = 20$ and $17 + 3 = 20$.
- S: They both have a 3 and a 7 in the ones place. \rightarrow 3 and 7 make another ten. \rightarrow It's just like the last problem we did. The ones digits are switched but the answer is the same.
- T: Write at least one set of similar problems.

Circulate and choose two students' work, one that completes the ten and one that does not, but does show the associative and commutative properties.

MP.3

- S: $12 + 8$ and $18 + 2$. $\rightarrow 12 + 4 = 16$ and $14 + 12 = 26$.
- T: (Record on board.) Excellent choices.
- S: But the second doesn't use a basic fact that equals ten!
- T: Charles, can you defend your response?
- S: I think it is the same, because both problems show the switch around in the ones place.
- S: Yeah, both pairs use one basic fact.
- S: The teacher didn't say exactly what had to be the same. Charles just didn't make a ten.
- T: Is he wrong or right? Discuss it with your partner.

Part 2: Subtracting within the teens.

Present five counters in one column.

- T: What subtraction sentence takes away this set (cover 3 red)?
- S: $5 - 3 = 2$.
- T: (Place a ten-frame card next to the five counters.)
- T: What is $10 + 5 - 3$? Subtract 3 from 5 first because there are enough ones in the ones place!
- T: $5 - 3$ is...?
- S: 2.
- T: $10 + 2$ is...?
- S: 12.
- T: What is $15 - 3$...?
- S: 12.
- T: (Write $10 + 2 = 12$ and $15 - 3 = 12$.) Show using a picture why these number sentences have the same answer.
- S: The 2 is what is left after you take away 3 ones from 5 ones. \rightarrow Cover up the tens. It says $5 - 3 = 2$. Then, just add the ten again. \rightarrow It's using a basic fact.
- T: We can take 3 from the ones because there are enough ones. What if we had $15 - 6$? Do we have enough ones then?
- S: No!

Freddy

The student work shows four examples of subtraction problems solved using ten-frames and basic facts:

- Example 1:** A ten-frame with 5 ones in the ones column. To the right, $12 + 3 = 15$ and $15 - 3 = 12$ are written. Below these, $10 + 2 = 12$ is written.
- Example 2:** A ten-frame with 5 ones in the ones column. To the right, $15 + 2 = 17$ and $17 - 2 = 15$ are written. Below these, $10 + 5 = 15$ is written.
- Example 3:** A ten-frame with 5 ones in the ones column. To the right, $13 + 6 = 19$ and $19 - 6 = 13$ are written. Below these, $10 + 3 = 13$ is written.
- Example 4:** A ten-frame with 5 ones in the ones column. To the right, $18 + 2 = 20$ and $20 - 2 = 18$ are written. Below these, $10 + 8 = 18$ is written.

T: With your partner, come up with at least two examples where there are not enough ones to subtract from the ones.

Part 3: Adding and subtracting within the teens

Note: In this final activity the two concepts of addition and subtraction come together using a part-whole model to represent related facts.

T: (Model the problems $12 + 3 = 15$ and $15 - 3 = 12$ with a ten-frame card and number bonds.)

T: What basic addition fact is related to $12 + 3 = 15$?

Repeat with the following problems: $15 + 2 = 17$, $17 - 2 = 15$; $13 + 6 = 19$, $19 - 6 = 13$; $18 + 2 = 20$, $20 - 2 = 18$.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.



NOTES ON APPLICATION PROBLEMS:

These are the four steps of the problem-solving process:

1. Read.
2. Draw.
3. Write a sentence.
4. Write a word sentence.

This process provides accommodation for SWD and English language learners students since it is both visual and kinesthetic. The exemplar of MP.2 to the left is a guided process, which also certainly supports the same subgroups.

To challenge advanced students, consider assigning them Problem 2 instead of engaging them in guided practice for Problem 1.

Application Problem (10 minutes)

Problem 1

Melia and Maya both love animals. Melia counted 17 puppies in one cage at the animal shelter and 3 in another cage. Maya counted 13 kittens in one cage and 7 in another.

- a. How many kittens are there in all?
- b. How many puppies are there in all?
- c. Write a sentence comparing the number of puppies and kittens.

Problem 2

Melia and Maya both love animals. Melia counted 47 puppies in one cage at the animal shelter and 3 in another cage. Maya counted 43 kittens in one cage and 7 in another.

- a. How many animals are there in all?
- b. Explain how you know using a drawing, number sentences, and word sentences.

Note: Problem 2 is designed for students who do not require guided practice. Both problems are an application of today's lesson, in which students added the basic facts in the ones place to add within 20.

Melia

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Puppies

$17 + 3 = 20$
 $10 + 7 = 17$
 $10 + 10 = 20$

Maya

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

Kittens

$13 + 7 = 20$
 $10 + 3 = 13$
 $10 + 10 = 20$

a. There are 20 kittens.
 b. There are 20 puppies.
 c. The number of kittens and puppies is the same!

The intention of this lesson is for students to use number bonds and arrive at $10 + 3 + 7 = 10 + 10$ and $10 + 7 + 3 = 10 + 10$. Help them notice the commutative property in these equations, since G2–M1–Lesson 3 focused on the associative property.

To demonstrate the commutative property, call on three students to stand in a line. Have them switch positions, and then elicit from students that no matter what position they are in, they are still the same three students.

Student Debrief (10 minutes)

Lesson Objective: Make a ten to add and subtract within 20.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Talk to your partner and write a problem related to $17 + 3$ on your personal board.
- Talk to your partner and write a problem related to $16 - 2$ on your personal board.
- Look at the first page of the Problem Set. Talk to your partner about any connections you notice between the problems.
- Talk to your partner about what you think our lesson's focus is today.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

During the Debrief, students use personal white boards to write related problems. Students working above grade level can be challenged to write as many problems as possible in a time frame. Give these students a purpose by placing extra problems in a bonus box to be used for future homework assignments, with credit given to the author.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 4 Problem Set 2•1

Name Jenny Date _____

Use basic facts to help you solve with mental math.

1. $13 + 2 = 15$	2. $15 - 3 = 12$
3. $11 + 4 = 15$	4. $15 - 4 = 11$
5. $14 + 2 = 16$	6. $15 - 2 = 13$
7. $13 + 6 = 19$	8. $17 - 5 = 12$
9. $16 \div 12 = 4$	10. $16 \div 18 = 2$
11. $14 \div 3 = 17$	12. $19 \div 2 = 17$
13. $19 \div 6 = 13$	14. $14 \div 19 = 5$

COMMON CORE Lesson 4: Make a ten to add and subtract within 20. Date: 4/24/14 engage^{ny} 1.8.23

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Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 4 Problem Set 2•1

15. Circle the number sentences that are true.

$13 = 10 + 2$

2.0 $13 + 7 = 17 + 3$ 2.0

1.1 $13 - 2 = 10 + 1$ 1.1

$12 + 5 = 17 + 1$

16. Autumn made some cookies. She ate 4 of them and had 16 left. How many did she make?

$4 + 16 = 20$

Autumn made 20 cookies.

17. Mrs. Parker read 12 books last year. So far this year she has read 3 books. How many books has she read altogether?

$12 + 3 = 15$

Mrs. Parker has read 15 books.

18. Andy had \$48. He spent \$5 on a book and gave \$3 to his brother. How much money does he have left?

$5 + 3 = 8$

$40 + 8 = 48$

Andy has 40 dollars left.

COMMON CORE Lesson 4: Make a ten to add and subtract within 20. Date: 4/24/14 engage^{ny} 1.B.23

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Name _____

Date _____

Use basic facts to help you solve with mental math.

1. $13 + 2 = \underline{\quad}$

2. $15 - 3 = \underline{\quad}$

3. $11 + 4 = \underline{\quad}$

4. $15 - 4 = \underline{\quad}$

5. $14 + \underline{\quad} = 16$

6. $15 - \underline{\quad} = 13$

7. $13 + 6 = \underline{\quad}$

8. $17 - 5 = \underline{\quad}$

9. $\underline{\quad} = 12 + 4$

10. $\underline{\quad} = 18 - 2$

11. $\underline{\quad} + 3 = 17$

12. $\underline{\quad} - 2 = 17$

13. $19 = \underline{\quad} + 13$

14. $14 = \underline{\quad} - 5$

15. Circle the number sentences that are true.

$$13 = 10 + 2$$

$$13 + 7 = 17 + 3$$

$$13 - 2 = 10 + 1$$

$$12 + 5 = 17 + 1$$

16. Autumn made some cookies. She ate 4 of them and had 16 left. How many did she make?

17. Mrs. Parker read 12 books last year. So far this year she has read 3 books. How many books has she read altogether?

18. Andy had \$48. He spent \$5 on a book and gave \$3 to his brother. How much money does he have left?

Name _____

Date _____

Solve the problems. Write the basic fact that helps you solve each one. The first one is done for you.

1. $14 - 1 = \underline{13}$

Basic Fact: $\underline{4 - 1 = 3}$

2. $14 + 1 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

3. $15 + 3 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

4. $18 + 2 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

5. $17 - 6 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

6. $19 + 7 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

7. $16 + 4 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

8. $12 + 8 = \underline{\hspace{2cm}}$

Basic Fact: $\underline{\hspace{2cm}}$

Name _____

Date _____

Use basic facts to help you solve with mental math.

1. $16 + 3 =$ _____

2. $13 - 6 =$ _____

3. $4 + 15 =$ _____

4. $14 + 5 =$ _____

5. $7 + 11 =$ _____

6. $17 + 1 =$ _____

7. $17 + 3 =$ _____

8. $13 + 7 =$ _____

9. $14 - 4 =$ _____

10. $18 - 8 =$ _____

11. $19 - 3 =$ _____

12. $18 - 4 =$ _____

13. $16 - 3 =$ _____

14. $17 - 5 =$ _____

15. Circle the number sentences that are true.

$$17 = 12 + 5$$

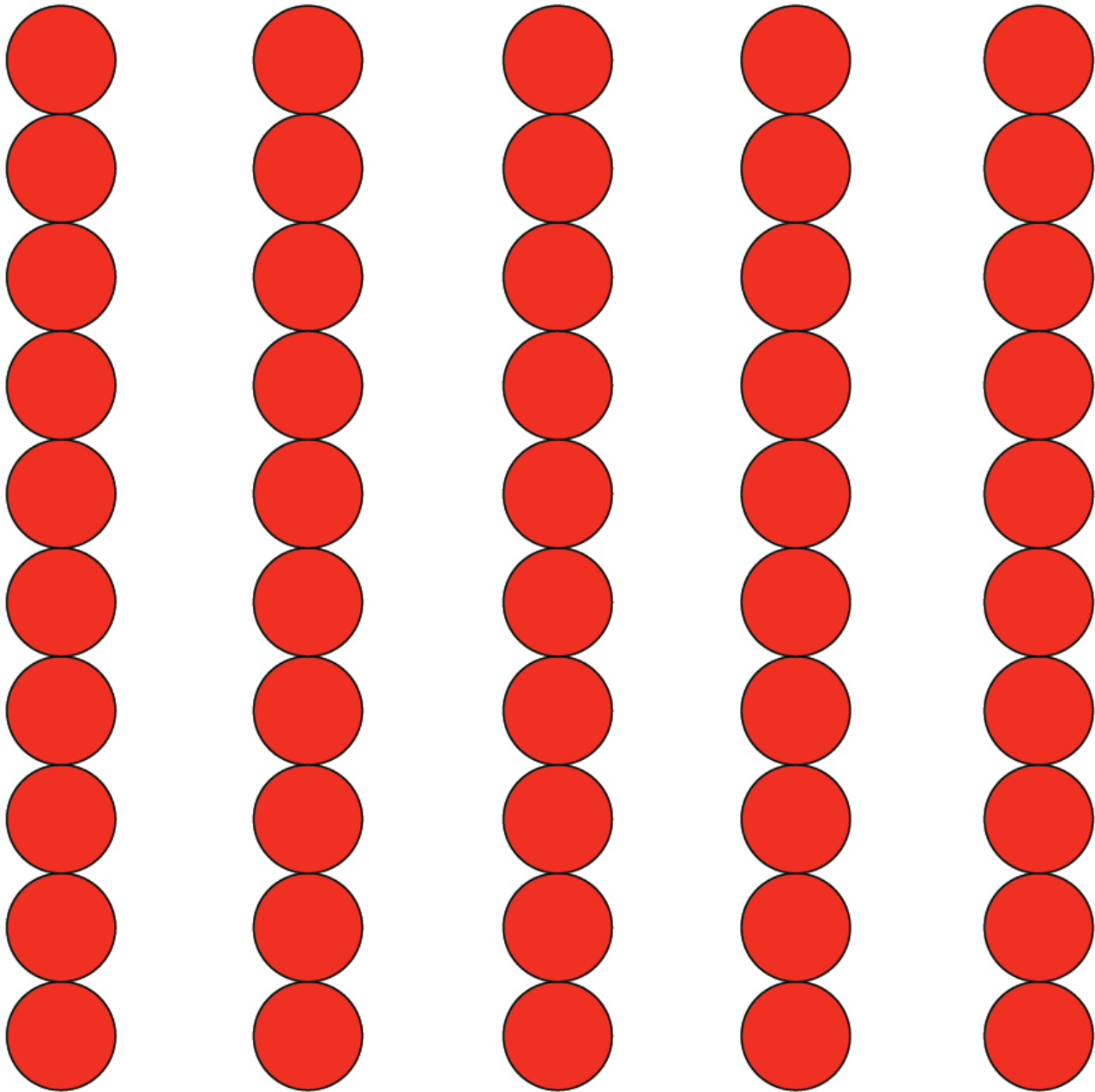
$$14 + 4 = 13 + 3$$

$$11 - 7 = 17 + 1$$

$$12 + 5 = 15 + 2$$

16. Vinny caught 12 baseballs during the first game of the day. He caught some more during the second game of the day. If he caught 19 baseballs during both games, how many baseballs did he catch in the second game?

17. Draw ten-frame cards to explain why $14 + 2 = 12 + 4$.



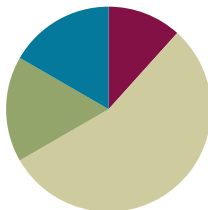
ten-strips

Lesson 5

Objective: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems.

Suggested Lesson Structure

■ Fluency Practice	(7 minutes)
■ Concept Development	(33 minutes)
■ Application Problem	(10 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (7 minutes)

- Take from Ten **2.OA.2** (3 minutes)
- Take from the Ones **2.OA.2** (4 minutes)

Take from Ten (3 minutes)

Note: This activity builds fluency when subtracting from ten when the subtrahend is greater than the ones digit.

T: When I say 1, you say 9. $10 - 1 = 9$. Ready? 2.

S: 8.

T: What's the number sentence?

S: $10 - 2 = 8$.

Continue with the following sequence: 7, 4, 9, 0, 5, and 8.

Take from the Ones (4 minutes)

Note: As students realize that at times they have enough ones to subtract, they then become aware that sometimes they do not and must take from the ten.

T: Let's take from the ones. $5 - 3 = \underline{\quad}$.

S: 2.

T: $15 - 3 = \underline{\quad}$.

S: 12.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Provide students with a 20-bead Rekenrek so that they can see numbers to 10 as a number line on one row or a ten-frame (5 beads on two rows). Connect numbers to concrete experiences by encouraging English language learners to show their answers with their fingers.

Continue with the following possible sequence: $6 - 2$; $16 - 2$; $8 - 4$; $18 - 4$; $4 - 2$; $14 - 2$; $7 - 5$; $17 - 5$; $9 - 6$; $19 - 6$; $7 - 3$; $17 - 3$; $8 - 5$; $18 - 5$; $9 - 5$; $19 - 5$; $9 - 2$; and $19 - 2$.

Concept Development (33 minutes)

Materials: (T) Two-sided counters (S) Personal white board, ten-strip (Lesson 4 Template), bag of two-sided counters, a subtracting strip (this is simply a white strip of paper, pictured in the photograph in Part 2)

Note: Two-sided counters can be any available objects that allow students to see two distinct parts (e.g., linking cubes in two different colors, spray painted beans, two-color counters).

Part 1: Solve problems with a common subtrahend (e.g., $11 - 8$, $12 - 8$, $13 - 8$, etc.)

T: (Present ten counters, eight of one color, two of another as shown at right.)

T: How many counters are here (signaling the 10 arranged as 2 fives)?

S: 10.

T: If I subtract the red counters, what is left?

S: 2.

T: What subtraction sentence takes away 8?

S: $10 - 8 = 2$.

T: (Place one counter next to the ten as shown at right.) How many counters are here?

S: 11.

T: Let's subtract 8 again.

T: How many counters are left (point to the 2 and 1)?

S: 3.

T: What addition sentence puts these two sets together?

S: $2 + 1 = 3$.

T: So, $11 - 8 = 2 + 1$?

S: Yes.

T: What subtraction sentence have we modeled?

S: $11 - 8 = 3$.

T: (Place another counter next to the ten as shown at right.) How many counters are here?

S: 12.

T: What subtraction sentence takes away 8?

S: $12 - 8 = 4$.

T: What addition sentence puts the remaining sets together?

S: $2 + 2 = 4$.

T: So, $12 - 8 = 2 + 2$?

$10 - 8 = 2$

$11 - 8 = 3$
 \wedge
 $10 \quad 1$
 $10 - 8 = 2$
 $2 + 1 = 3$
 $11 - 8 = 3$

$12 - 8 = 4$
 \wedge
 $10 \quad 2$
 $10 - 8 = 2$
 $2 + 2 = 4$
 $12 - 8 = 4$

S: Yes.

T: Explain $11 - 8 = 2 + 1$ and $12 - 8 = 2 + 2$ to your partner. Use the models to help you.

Part 2: Determine whether to subtract from the ten or the ones.

T: Watch as I model the number 14 with a ten-strip and ones counters. (Show a ten-strip and a column of 4 to its right.)

T: For $14 - 3$, do I have enough ones to subtract 3 from the ones?

S: Yes.

T: Subtract 3 from 4. (Cover 3 counters with subtracting strip as pictured below.) $14 - 3$ is...?

S: 11.

T: Use addition to put together the two parts that are left.

S: $10 + 1 = 11$.

T: (Show the number 14 again.) For $14 - 8$, do we have enough ones to subtract 8 from the ones?

S: No.

T: Subtract 8 from the ten. (Cover 8 of the ten-strip with subtracting strip as pictured to the right.) $14 - 8$ is...?

S: 6.

T: Use addition to put together the two parts that are left.

S: $2 + 4 = 6$.

T: For $14 - 3$, we subtracted from the ones. For $14 - 8$, we subtracted from the...?

S: Ten.

T: Show me the number 13 with your ten-strip and ones counters.

S: (Show a ten-strip and a column of 3 to its right.)

T: $13 - 8$. Use your subtraction strip to subtract from either the ten or the ones.

T: What's the complete number sentence?

S: $13 - 8 = 5$.

T: Did you subtract from the ten or the ones?

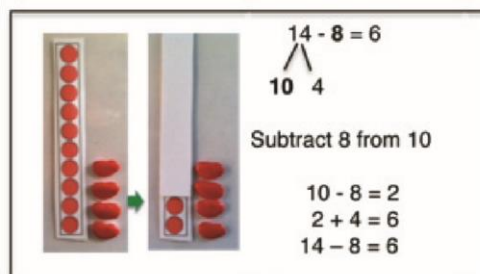
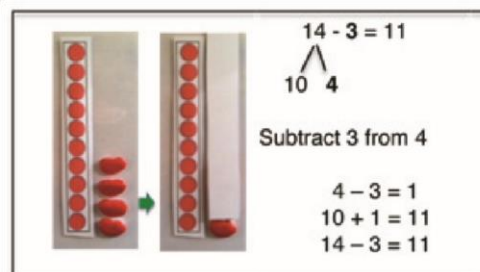
S: The ten.

T: Let's do another. $15 - 2$.

S: (Show 10 and 5, and then cover 2 of the 5 ones.)

T: What's the complete number sentence?

S: $15 - 2 = 13$.



Quickly continue with other examples alternating between taking from the ones and taking 8 from the ten and asking them from which they subtracted, the ten or the ones. Using personal white boards, students record solutions with number bonds. If they still need the models, allow them to continue working with a ten-strip and counters.

T: Talk to your partner. How does $10 - 8$ help you to solve $12 - 8$?

T: How would $10 - 9$ help you to solve $13 - 9$?

Part 3: Extension

Note: Just as in the previous lessons, the goal is for students to achieve fluency over time by recognizing connections and developing mental strategies that support their mastery of standard **2.OA.2**. In addition to subtracting from 10 with a common minuend and subtracting from 10 with a common difference, it is also imperative that students have significant amounts of mixed practice as the year progresses.

The problems below are modeled for use in fluency activities throughout the year as students develop fluency with sums and differences to 20, with an emphasis on using 10. If there is time within today's lesson, consider advancing to these problems.

Subtract from 10 with a common minuend.

$11 - 2$; $11 - 3$; $11 - 4$; $11 - 5$; $11 - 6$; $11 - 7$; $11 - 8$; $11 - 9$.

$12 - 3$; $12 - 4$; $12 - 5$; $12 - 6$; $12 - 7$; $12 - 8$; $12 - 9$.

$13 - 4$; $13 - 5$; $13 - 6$; $13 - 7$; $13 - 8$; $13 - 9$.

$14 - 5$; $14 - 6$; $14 - 7$; $14 - 8$; $14 - 9$.

$15 - 6$; $15 - 7$; $15 - 8$; $15 - 9$.

$16 - 7$; $16 - 8$; $16 - 9$.

$17 - 8$; $17 - 9$.

$18 - 9$.

Subtract from 10 with a common difference. Over time, present students with opportunities to realize that when subtracting from 12, for example, we always are adding back the 2 ones.

$11 - 2$; $12 - 3$; $13 - 4$; $14 - 5$; $15 - 6$; $16 - 7$; $17 - 8$; $18 - 9$.

$11 - 3$; $12 - 4$; $13 - 5$; $14 - 6$; $15 - 7$; $16 - 8$; $17 - 9$.

$11 - 4$; $12 - 5$; $13 - 6$; $14 - 7$; $15 - 8$; $16 - 9$.

$11 - 5$; $12 - 6$; $13 - 7$; $14 - 8$; $15 - 9$.

$11 - 6$; $12 - 7$; $13 - 8$; $14 - 9$.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.



NOTES ON PACING:

The work thus far takes the entire 26 minutes. Part 2 and Part 3 problems are modeled for use in fluency activities throughout the year as students develop fluency with sums and differences to 20, with an emphasis on using 10. If there is time within the day's lesson, consider advancing to Part 3 problems.

There are clearly other strategies for subtracting from the teens such as counting back and adding on. However, the take from ten strategy develops the important skill of breaking apart a unit relevant to work with place value, measurement, units, and fractions.

Application Problem (10 minutes)

Problem 1

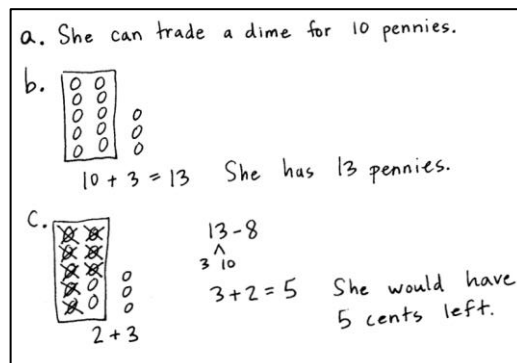
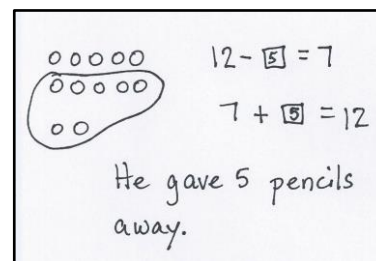
Pencils come 12 to a package. Shane gives some pencils to his friends. Now he has 7 left. How many pencils did he give away?

Problem 2

Sylvia has a dime and three pennies. A friend asked her for 8 cents.

- What can Sylvia do to be able to give her friend 8 cents?
- How many pennies does Sylvia have after she trades her dime?
- How much money would she have left after giving away 8 cents?

Note: Today's problems provide practice decomposing to subtract from a ten. Some students may simply know the answer, so it is important to establish the purpose of the Application Problem of each lesson. It is the time to focus on understanding the situation presented in the problem and representing that situation with a drawing and an equation. It is also the time for students to share their representations and their ways of thinking, which can help more students access problem-solving strategies. Below is a sample dialogue to guide students through Problem 2.



S: (Read chorally.)

T: (Model one dime and three pennies.) What is the value of the money?

S: 13.

T: 13 what? Remember to always state the unit.

S: 13 cents.

T: Talk to your partner about how Sylvia can give her friend 8 cents.

S: She can't. → Yeah, she can, she has 13 cents and 13 is more than 8. → We can switch a dime for ten pennies. → Oh, yeah, then there are enough pennies to give 8.

Circulate, listen, and provide advancing questions to move students forward. At times, speak very quietly, and at other times, speak loudly enough so that the whole class has access to the hint.

T: As I moved around the room, I heard lots of students suggesting that Sylvia could trade her dime for ten pennies. Thumbs up if this was your idea.

T: (Model the exchange, laying pennies out in a ten-frame format.) Look at the model. To give her friend 8 cents, should Sylvia take the money from the ten pennies or from the three pennies?

S: The ten.

T: (Cover the 10.) Can I take 8 from 3?

S: No.

MP.1

MP.1

- T: (Cover the 3.) Can I take 8 from 10?
- S: Yes.
- T: Yes, because you have enough.
- T: Imagine Sylvia gives her friend the eight pennies. Turn and talk to your partner about how many pennies are left. Tell me how many.
- S: 5.
- T: (Take the eight pennies away from ten.) How many were left from the dime?
- S: 2.
- T: How many were left from the extra pennies? (Isolate the set with your hands.)
- S: 3.
- T: What addition sentence combines these?
- S: $2 + 3 = 5$.
- T: (Write the number sentence $13 - 8 = 2 + 3$.) Turn and talk to your partner about what each number means in this number sentence.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 2•1

Name Aiden Date _____

1. Solve the following problems. Circle the number sentence if you must subtract from the ten.

A	B	C
$10 - 2 = 8$	$10 - 7 = 3$	$10 - 4 = 6$
$11 - 2 = 9$ $10 - 1 = 9$	$11 - 7 = 4$ $10 - 3 = 7$	$11 - 4 = 7$ $10 - 6 = 4$
$12 - 2 = 10$ $10 - 2 = 10$	$12 - 7 = 5$ $10 - 2 = 8$	$12 - 4 = 8$ $10 - 6 = 4$
$13 - 2 = 11$ $10 - 3 = 7$	$13 - 7 = 6$ $10 - 3 = 7$	$13 - 4 = 9$ $10 - 6 = 4$
$14 - 2 = 12$ $10 - 4 = 6$	$14 - 7 = 7$ $10 - 4 = 6$	$14 - 4 = 10$ $10 - 4 = 6$
$15 - 2 = 13$ $10 - 5 = 5$	$15 - 7 = 8$ $10 - 5 = 5$	$15 - 4 = 11$ $10 - 6 = 4$
$16 - 2 = 14$ $10 - 6 = 4$	$16 - 7 = 9$ $10 - 6 = 4$	$16 - 4 = 12$ $10 - 6 = 4$
$17 - 2 = 15$ $10 - 7 = 3$	$17 - 7 = 10$ $10 - 7 = 3$	$17 - 4 = 13$ $10 - 7 = 3$
$18 - 2 = 16$ $10 - 8 = 2$	$18 - 7 = 11$ $10 - 8 = 2$	$18 - 4 = 14$ $10 - 8 = 2$
$19 - 2 = 17$ $10 - 9 = 1$	$19 - 7 = 12$ $10 - 9 = 1$	$19 - 4 = 15$ $10 - 9 = 1$

COMMON CORE Lesson 5: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems. 4/26/14 engage^{ny} 1.8.34

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Student Debrief (10 minutes)

Lesson Objective: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Let's look at Problem 1 column A on the Problem Set. How does knowing $10 - 2$ help you solve the rest of the problems?
- What is the relationship of the problems in Column B?
- What basic fact helps you solve the problems in Column B? Column C?
- In Problem 2, where did the 2 come from in $11 - 8 = 2 + \underline{\quad}$?



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Since the Problem Set does not include the pictorial or concrete, invite tactile learners to use their beans and subtraction strips to model the problems.

The goal in both making a 10 and taking from 10 is for students to master mental math. An important bridge is visualization. Have them use a ten-frame card, but flip it over so they cannot see the units. Allow students to peek if they must, but encourage them to visualize the quantity next time.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the student.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 2•1

2. Fill in the blank to make the number sentence correct.

a. $11 - 8 = 2 + \underline{1}$ $\begin{array}{r} 11-8 \\ 1 \text{ } 10 \end{array}$

b. $14 - 5 = 5 + \underline{4}$ $\begin{array}{r} 14-5 \\ 4 \text{ } 10 \end{array}$

c. $17 - 8 = 2 + \underline{7}$ $\begin{array}{r} 17-8 \\ 7 \text{ } 10 \end{array}$

d. $16 - 9 = 1 + \underline{6}$ $\begin{array}{r} 16-9 \\ 6 \text{ } 10 \end{array}$

e. $13 - 7 = 3 + \underline{3}$ $\begin{array}{r} 13-7 \\ 3 \text{ } 10 \end{array}$

f. $18 - 4 = 6 + \underline{8}$ $\begin{array}{r} 18-4 \\ 8 \text{ } 10 \end{array}$

3. Susan has a new pack of 10 pencils and 4 pencils from an old pack. She gave 6 pencils from the new pack to her brother. How many pencils does she have left?

$\begin{array}{|c|} \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \text{X} \\ \hline \end{array}$ $\begin{array}{r} 10+4=14 \\ 14-6=8 \\ 4+4=8 \end{array}$ Susan has 8 pencils left.

4. Marco brought his marble collection to school. He has 11 blue marbles and 7 red marbles. At school, Marco lost 3 of his blue marbles.

a. How many blue marbles does he have now? $\begin{array}{|c|} \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \end{array}$ $\begin{array}{r} 11-3=8 \\ 1+7=8 \end{array}$ Marco has 8 blue marbles now.

b. How many total marbles does he have left? $\begin{array}{|c|} \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \text{B} \\ \hline \end{array}$ $\begin{array}{r} 8+7=15 \\ 2+5=7 \\ 10+5=15 \end{array}$ Marco has 15 marbles left.

COMMON CORE Lesson 5: Decompose to subtract from a ten when subtracting within 20 and apply to one-step word problems. 4/26/14 engage^{ny} 1.B.35

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Name _____

Date _____

1. Solve the following problems. Circle the number sentence if you must subtract from the ten.

A	B	C
$10 - 2 = \underline{\quad}$	$10 - 7 = \underline{\quad}$	$10 - 4 = \underline{\quad}$
$11 - 2 = \underline{\quad}$	$11 - 7 = \underline{\quad}$	$11 - 4 = \underline{\quad}$
$12 - 2 = \underline{\quad}$	$12 - 7 = \underline{\quad}$	$12 - 4 = \underline{\quad}$
$13 - 2 = \underline{\quad}$	$13 - 7 = \underline{\quad}$	$13 - 4 = \underline{\quad}$
$14 - 2 = \underline{\quad}$	$14 - 7 = \underline{\quad}$	$14 - 4 = \underline{\quad}$
$15 - 2 = \underline{\quad}$	$15 - 7 = \underline{\quad}$	$15 - 4 = \underline{\quad}$
$16 - 2 = \underline{\quad}$	$16 - 7 = \underline{\quad}$	$16 - 4 = \underline{\quad}$
$17 - 2 = \underline{\quad}$	$17 - 7 = \underline{\quad}$	$17 - 4 = \underline{\quad}$
$18 - 2 = \underline{\quad}$	$18 - 7 = \underline{\quad}$	$18 - 4 = \underline{\quad}$
$19 - 2 = \underline{\quad}$	$19 - 7 = \underline{\quad}$	$19 - 4 = \underline{\quad}$

2. Fill in the blank to make the number sentence correct.

a. $11 - 8 = 2 + \underline{\hspace{2cm}}$

b. $14 - 5 = 5 + \underline{\hspace{2cm}}$

c. $17 - 8 = 2 + \underline{\hspace{2cm}}$

d. $16 - 9 = 1 + \underline{\hspace{2cm}}$

e. $13 - 7 = 3 + \underline{\hspace{2cm}}$

f. $18 - 4 = 6 + \underline{\hspace{2cm}}$

3. Susan has a new pack of 10 pencils and 4 pencils from an old pack. She gave 6 pencils from the new pack to her brother. How many pencils does she have left?

4. Marco brought his marble collection to school. He has 11 blue marbles and 7 red marbles. At school, Marco lost 3 of his blue marbles.

a. How many blue marbles does he have now?

b. How many total marbles does he have left?

Name _____

Date _____

Complete each set.

1.
$$\begin{array}{r} 15 - 9 \\ \wedge \end{array}$$

$10 - 9 = \underline{\quad}$

$1 + 5 = \underline{\quad}$

$15 - 9 = \underline{\quad}$

2.
$$\begin{array}{r} 14 - 6 \\ \wedge \end{array}$$

$10 - 6 = \underline{\quad}$

$4 + 4 = \underline{\quad}$

$14 - 6 = \underline{\quad}$

3.
$$\begin{array}{r} 11 - 8 \\ \wedge \end{array}$$

$10 - \underline{\quad} = \underline{\quad}$

$\underline{\quad} + 1 = \underline{\quad}$

$11 - 8 = \underline{\quad}$

4.
$$\begin{array}{r} 12 - 7 \\ \wedge \end{array}$$

$10 - \underline{\quad} = \underline{\quad}$

$\underline{\quad} + 2 = \underline{\quad}$

$12 - 7 = \underline{\quad}$

Name _____

Date _____

1. Solve the following problems. Circle the number sentence if you must subtract from the ten.

A	B	C
$10 - 3 = \underline{\quad}$	$10 - 5 = \underline{\quad}$	$10 - 6 = \underline{\quad}$
$11 - 3 = \underline{\quad}$	$11 - 5 = \underline{\quad}$	$11 - 6 = \underline{\quad}$
$12 - 3 = \underline{\quad}$	$12 - 5 = \underline{\quad}$	$12 - 6 = \underline{\quad}$
$13 - 3 = \underline{\quad}$	$13 - 5 = \underline{\quad}$	$13 - 6 = \underline{\quad}$
$14 - 3 = \underline{\quad}$	$14 - 5 = \underline{\quad}$	$14 - 6 = \underline{\quad}$
$15 - 3 = \underline{\quad}$	$15 - 5 = \underline{\quad}$	$15 - 6 = \underline{\quad}$
$16 - 3 = \underline{\quad}$	$16 - 5 = \underline{\quad}$	$16 - 6 = \underline{\quad}$
$17 - 3 = \underline{\quad}$	$17 - 5 = \underline{\quad}$	$17 - 6 = \underline{\quad}$
$18 - 3 = \underline{\quad}$	$18 - 5 = \underline{\quad}$	$18 - 6 = \underline{\quad}$
$19 - 3 = \underline{\quad}$	$19 - 5 = \underline{\quad}$	$19 - 6 = \underline{\quad}$

2. Fill in the blank to make the number sentence correct.

a. $14 - 8 = 2 + \underline{\hspace{2cm}}$

b. $15 - 6 = 4 + \underline{\hspace{2cm}}$

c. $18 - 9 = 1 + \underline{\hspace{2cm}}$

d. $16 - 7 = 3 + \underline{\hspace{2cm}}$

e. $11 - 5 = 5 + \underline{\hspace{2cm}}$

f. $13 - 4 = 6 + \underline{\hspace{2cm}}$

3. Mrs. Jones collects 12 eggs from her chickens in the morning. Mr. Jones collects 5 more eggs in the evening. They used 8 eggs for dinner. How many eggs are left?

4. Eleven pink roses and 7 red roses are growing in Mrs. Thompson's garden. She wants to give 9 of the pink roses to her neighbor. How many roses will she have left?



Topic C

Strategies for Addition and Subtraction Within 100

2.OA.1, 2.NBT.5, 2.OA.2, 1.NBT.4, 1.NBT.5, 1.NBT.6

Focus Standard:	2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
Instructional Days:	3	
Coherence	-Links from: G1–M2	Introduction to Place Value Through Addition and Subtraction Within 20
	-Links to: G2–M2	Addition and Subtraction Within of Length Units
	G2–M4	Addition and Subtraction Within 200 with Word Problems to 100

In Topic C, students revisit their addition and subtraction skills, practicing with larger numbers up to 100. Throughout this topic, students use ten-frames and number bonds to add and subtract using the structure of ten. In Lesson 6, students only add or subtract a number less than 10 without crossing the multiple (e.g., $63 + 2$, $65 - 2$). Students use their knowledge of basic facts and place value to solve problems with larger numbers. For example, knowing that $5 - 2 = 3$ enables students to easily subtract $65 - 2$. At times, students respond using Say Ten form (e.g., 26 is 2 tens 6) to see that in a sequence (e.g., $6 - 4$, $16 - 4$, $26 - 4$, $36 - 4$, etc.) the number of tens changes but the basic fact remains the same.

Lesson 7 builds upon students' knowledge of basic facts within the teens (e.g., $7 + 8 = 15$) to add 2-digit and 1-digit numbers (e.g., $77 + 8 = 85$). Hence, the new complexity is to cross a multiple of 10. Students apply $7 + 5 = 10 + 2$ to easily solve $87 + 5 = 90 + 2$ (shown right). Again, students make use of the ten structure and place value to separate a two-digit number into tens and ones, and bond smaller numbers to make a ten.

$$\begin{array}{r}
 87 + 5 = 92 \\
 \swarrow \quad \searrow \quad \swarrow \quad \searrow \\
 80 \quad 7 \quad 3 \quad 2
 \end{array}$$

Lesson 8 mirrors the work of Lesson 7 in that students subtract single-digit numbers from multiples of 10. Students use $10 - 3$ to solve $90 - 3$ (shown right), and they use this strategy to solve a variety of one-step word problem types. Also, since students know partners of ten with automaticity, adding some ones after taking from the ten should not be too challenging (e.g., $91 - 3 = 88$). Topic

$$\begin{array}{r}
 90 - 3 = 87 \\
 \swarrow \quad \searrow \\
 80 \quad 10
 \end{array}$$

C culminates with students learning that it is possible to “get out the ten” in problems such as $23 - 9$ and add back the remaining part, such that $13 + (10 - 9) = 14$. This decomposing to make or take from a ten prepares students for adding and subtracting three-digit numbers in Module 4.

A Teaching Sequence Towards Mastery of Strategies for Addition and Subtraction Within 100

Objective 1: Add and subtract within multiples of ten based on understanding place value and basic facts.
(Lesson 6)

Objective 2: Add within 100 using properties of addition to make a ten.
(Lesson 7)

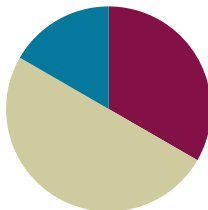
Objective 3: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems.
(Lesson 8)

Lesson 6

Objective: Add and subtract within multiples of ten based on understanding place value and basic facts.

Suggested Lesson Structure

■ Fluency Practice	(20 minutes)
■ Concept Development	(30 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (20 minutes)

- Say Ten Counting from 26 to 58 **2.NBT.1** (2 minutes)
- Take from 20 **2.OA.2** (4 minutes)
- Basic Facts Are Tools **2.OA.2** (5 minutes)
- Sprint: Adding Ones to Ones **2.OA.2** (9 minutes)

Say Ten Counting from 26 to 58 (2 minutes)

Materials: (T) Hide Zero cards (Lesson 2 Template 1), Rekenrek

Note: Students need a clear understanding of the structure of ten to be able to add and subtract within multiples of 10.

- T: (Show 22 with Hide Zero cards.) What is 2 more than 20, the regular way?
- S: 22.
- T: (Pull cards apart to show $20 + 2$.) What is the Say Ten way to say 22?
- S: 2 tens 2.
- T: (Show 23.) What is the Say Ten way for 23?
- S: 2 tens 3.
- T: (Pull cards apart to show $20 + 3$.) That's right!
- T: Let's count the Say Ten way starting from 26 on the Rekenrek. As I move the beads, count aloud. What is the Say Ten way for 26?



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

During Fluency Practice, students recall and build upon their prior knowledge of place value and basic facts from Grade 1. Design math centers that include concrete representations for students (e.g., Rekenrek, ten-frames, linking cubes). Suggestions for centers ideas include the following:

- Rekenrek: Make ten, add/subtract across ten, build numbers 11–20, etc.
- Ten-frames: Roll dice and build the number, ten-frame flash (add or take away 1), two more/less, double it, etc.
- Linking cubes: Build a tower with two colors that shows a given total, build towers to 10 and relate quantities with number sentences, and build partner towers and tell how many more or less.

T: (Show 26 with beads pulled to the left on the Rekenrek.)

S: 2 tens 6.

S: 2 tens 7, 2 tens 8, 2 tens 9, 3 tens, 3 tens 1, 3 tens 2.

Continue counting to 5 tens 8.

Take from 20 (4 minutes)

Materials: (S) Personal white boards

Note: The lesson relies on a student's ability to make ten and apply it to multiples of 10. This exercise will give students familiarity with the skill prior to the Concept Development.

T: Take the number I say from 10. I say 1, you say 9. Then write the number sentence and wait for my signal to show it.

T: 7.

S: 3. (Write number sentence.)

T: Show your personal white boards.

S: (Show $10 - 7 = 3$.)

Continue with the following possible sequence: 8, 6, and 9.

T: This time instead of taking from 10, let's take from 20. Ready? 1.

S: 19. (Write number sentence.)

T: Show your personal white board.

S: (Show $20 - 1 = 19$.)

Continue with the following possible sequence: 3, 2, 5, 0, 6, 8, 7, and 9.

Basic Facts Are Tools (5 minutes)

Materials: (T) Rekenrek

Note: This activity prepares students for the day's Concept Development by emphasizing the presence of the basic fact. The Rekenrek provides visual support, enabling students to see the structure of ten. For example, $8 + 3$ is seen as $8 + 2 + 1$.

T: Our basic fact, or tool, is $8 + 2$. $8 + 2$ is...?

S: 10.

T: $8 + 3$ is...? (Show the numbers on the Rekenrek each time.)

S: $10 + 1$.

T: $8 + 7$ is...?

S: $10 + 5$. (Continue with the following possible sequence: $9 + 5$, $9 + 4$, and $9 + 8$.)

T: Our new basic fact, or tool, is $10 - 8$. $10 - 8$ is...?

- S: 2.
 T: $12 - 8$ is...? (Show the numbers on the Rekenrek each time.)
 S: $2 + 2$.
 T: $15 - 8$ is...?
 S: $2 + 5$. (Continue with the following possible sequence: $12 - 9$ and $15 - 9$.)

Sprint: Adding Ones to Ones (9 minutes)

Materials: (S) Adding Ones to Ones Sprint

Note: The Sprint applies prior knowledge of adding basic facts to larger numbers.

Concept Development (30 minutes)

Materials: (T) Two-sided counters, 3 ten-frame cards for the number 10, set of ten-frame cards (Lesson 3 Template), linking cubes

Part 1: Add and subtract within a unit of 10 (e.g., $73 + 2$, $75 - 2$).

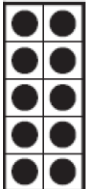
Note: Simple basic facts such as $3 + 2$ and $5 - 2$ are helpful in solving problems with larger numbers. Use the Say Ten way (e.g., 13 is 1 ten 3, 26 is 2 tens 6) to emphasize the presence of the basic fact.

- T: (Show two-sided counters.) $3 + 2$ is...?
 S: 5.
 T: $5 - 2$ is?
 S: 3.
 T: (Lay down a ten-frame card.) 1 ten $3 + 2$ is?
 S: 1 ten 5.
 T: $13 + 2$ is?
 S: 15.
 T: 1 ten $5 - 2$ is?
 S: 1 ten 3.
 T: $15 - 2$ is?
 S: 13.
 T: (Lay down another ten-frame card.) 2 tens $3 + 2$ is?
 S: 2 tens 5.
 T: $23 + 2$ is?
 S: 25.
 T: Partner A, talk to your partner about how $3 + 2$ helps you solve $23 + 2$.




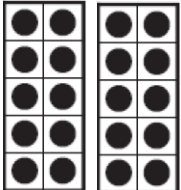
$$3 + 2 = 5$$

$$5 - 2 = 3$$




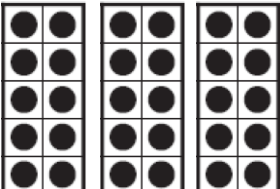
$$13 + 2 = 15$$

$$15 - 2 = 13$$





$$23 + 2 = 25$$

$$25 - 2 = 23$$




$$33 + 2 = 35$$

$$35 - 2 = 33$$


- S: It's easy because you just add the ones, so $20 + 5 = 25$. → I just think 2 tens 3 + 2 is 2 tens 5.
 T: 2 tens 5 – 2 is...?
 S: 2 tens 3.
 T: 25 – 2 is...?
 S: 23.
 T: Partner B, talk to your partner about how $5 - 2$ helps you solve $25 - 2$.
 S: The answer to the basic fact doesn't change so $5 - 2 = 3$ then add 20. → 2 tens 5 – 2 is 2 tens 3.
 T: (Lay down another ten-frame card.) 3 tens 3 + 2 is...?
 S: 3 tens 5.

Part 2: Look for and make use of structure.

- T: (Pass out the Problem Set.)
 T: Complete Problems 1 and 2.
 S: (Work.)
 T: With your partner, look at the problems with $2 + 4$ and $6 - 4$.
 T: Partner A, read your problems aloud to Partner B the Say Ten way. Then switch.
 T: Listen closely to your words. Do you hear a pattern?
 S: Yes!
 T: What pattern do you hear when you add?
 S: All the answers have 6 ones. → It's the same basic fact $2 + 4$.
 T: What pattern do you hear when you subtract?
 S: All the answers have 2 ones. → It's the same basic fact $6 - 4$.
 T: Explain to your partner what is different about your problems, both in addition and subtraction.
 S: The first number is different. → The ten is different. → The number of tens is different but the ones stay the same.
 T: The basic fact you heard is the same, but the number of tens changes.
 T: Make bonds in Problems 1 and 2 to break apart the ones from the number of tens. (Shown right.)
 S: (Work.)
 T: How does $6 - 4$ help you solve $56 - 4$? Talk to your partner.
 S: The number of tens doesn't change. → You just have to know the basic fact. → 5 tens 6 – 4 is 5 tens 2.

MP.7



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

In a healthy classroom culture, students may disagree with one another as they share their work. Disagreement encourages scrutiny and is an opportunity for students to learn and justify their choices. During partner talk, encourage students to justify arguments. Model and post good conversation starters: "I disagree because ..." "Your solution is different from mine because ..." "My error was ..." "Your answer does not make sense to me because ..." These starters should spark conversations within student partnerships.

$2 + 4 = \underline{\quad}$	$6 - 4 = \underline{\quad}$
\wedge	\wedge
10 2	30 6
$22 + 4 = \underline{\quad}$	$56 - 4 = \underline{\quad}$
\wedge	\wedge
20 2	50 6

T: (Allow students time to share.) Let me hear you subtract without the basic fact by counting down. Ready?

S: 55, 54, 53, 52.

Have students share with a partner about which strategy is easier to use, counting down or using the basic fact $6 - 4$.

T: Think of the different numbers of tens as towers of linking cubes of different sizes. No matter what size the tower is, the $2 + 4$ doesn't change. (Model this concept pictorially or concretely with linking cubes or blocks.)

T: It's helpful to look for structure and patterns to make math easier. Here's a structure (refer to the linking cube tower). The basic fact (refer to the model of $2 + 4$) helps create a number pattern when we repeatedly use it.

Part 3: Look for and make use of structure to complete a unit of 10 (e.g., $37 + 3$, $87 + 3$, $83 + 7$).

Note: As you move through the problems modeled below, be sure to record the number sentences sequentially for reflection at the end.

T: Present 10 counters (as shown to the right). $7 + 3$ is...?

S: 10.

T: (Lay down a ten-frame card.) Give the expression that is the same as $10 + 7 + 3$.

S: $10 + 10$.

T: 1 ten $7 + 3$ is...?

S: 2 tens.

T: $17 + 3$ is...? Give the addition sentence.

S: $17 + 3 = 20$.

T: (Lay down a ten-frame card.) Give the expression that is the same as $20 + 7 + 3$.

S: $20 + 10$.

T: 2 tens $7 + 3$ is...?

S: 3 tens.

T: $27 + 3$ is...? Give the addition sentence.

S: $27 + 3 = 30$.

T: (Lay down a ten-frame card.) $30 + 7 + 3$ is the same as...?

S: $30 + 10$.

T: 3 tens $7 + 3$ is...?

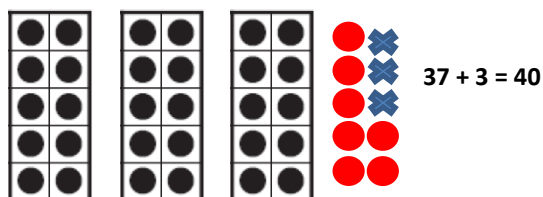
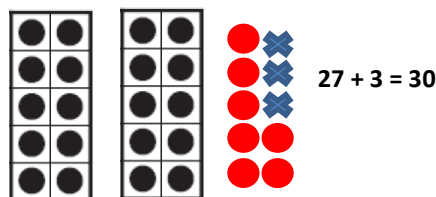
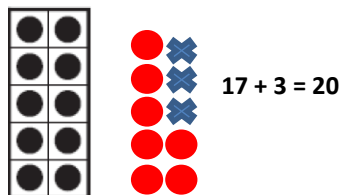
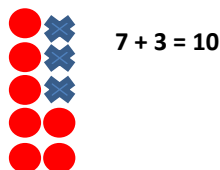
S: 4 tens.

T: $37 + 3$ is...? Give the addition sentence.

S: $37 + 3 = 40$.

T: Let's read each number sentence the Say Ten way.

S: $7 + 3 = 1$ ten; 1 ten $7 + 3 = 2$ tens; 2 tens $7 + 3 = 3$ tens; 3 tens $7 + 3 = 4$ tens.



- T: What basic fact creates the pattern?
 S: $7 + 3$.
 T: (Join 7 linking cubes with 3 cubes.) What new structure did we make?
 S: 10.

As students demonstrate proficiency allow them to complete the Problem Set.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

Lesson Objective: Add and subtract within multiples of ten based on understanding place value and basic facts.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Look at Problem 1 of the Problem Set. How does knowing $2 + 4$ help you solve $12 + 4$?
- How does solving the first column help you solve the second column?
- Talk to your partner about what you think our lesson's goal was today.
- How do structures or patterns help make math easier?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 6 Problem Set 2•1

Name Benny Date _____

Add or subtract. Then write two more related problems for each basic fact.

1. $2 + 4 = 6$ 2. $6 - 4 = 2$

$12 + 4 = 16$ $36 - 4 = 32$
 $22 + 4 = 26$ $56 - 4 = 52$
 $32 + 4 = 36$ $96 - 4 = 92$
 $42 + 4 = 46$ $76 - 4 = 72$

Add or subtract. Make number bonds to break apart the tens and ones.

3. $2 + 5 = 7$ 4. $7 - 5 = 2$

5. $12 + 5 = 17$ 6. $27 - 5 = 22$
 $10 + 2$ $20 + 7$
 7. $32 + 5 = 37$ 8. $47 - 5 = 42$
 $30 + 2$ $40 + 7$
 9. $72 + 5 = 77$ 10. $87 - 5 = 82$
 $70 + 2$ $80 + 7$

COMMON CORE Lesson 6: Add and subtract within multiples of ten based on understanding place value and basic facts. engage^{ny} 1.C.11
 Date: 4/26/14
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NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 6 Problem Set 2•1

11. $3 + 7 = 10$ 12. $10 - 7 = 3$

13. $13 + 7 = 20$ 14. $20 - 7 = 13$
 $10 + 3$ $10 + 10$
 15. $33 + 7 = 40$ 16. $50 - 7 = 43$
 $30 + 3$ $40 + 10$
 17. $53 + 7 = 60$ 18. $70 - 7 = 63$
 $50 + 3$ $60 + 10$
 19. Fifty-six people visited the museum for a tour. Nine people left before the tour was over. How many people stayed for the whole tour?

$56 - 9 = 47$ people stayed for the whole tour.
 $46 + 1 = 47$

Create at least two more sets of problems if you finish early.

$74 + 6 = 80$ $59 - 4 = 55$
 $70 + 4$ $50 + 7$
 $70 + 10 = 80$ $50 + 5 = 55$
 $84 + 6 = 90$ $99 - 4 = 95$
 $80 + 4$ $90 + 5 = 95$
 $80 + 10 = 90$

COMMON CORE Lesson 6: Add and subtract within multiples of ten based on understanding place value and basic facts. engage^{ny} 1.C.12
 Date: 4/26/14
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Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Do as many as you can in 60 seconds.

Do as many as you can in 60 seconds.

1	10 and 2 make	16	33 + 1 =	1	10 and 3 make	16	20 + 2 =
2	31 and 1 make	17	42 + 1 =	2	21 and 2 make	17	31 + 1 =
3	44 and 2 make	18	31 + 4 =	3	33 and 1 make	18	21 + 2 =
4	23 and 2 make	19	40 + 3 =	4	22 and 2 make	19	25 + 1 =
5	22 and 3 make	20	24 + 3 =	5	43 and 1 make	20	36 + 1 =
6	41 and 3 make	21	36 + 2 =	6	30 and 2 make	21	43 + 2 =
7	21 and 2 make	22	33 + 3 =	7	23 and 3 make	22	36 + 3 =
8	14 and 1 make	23	36 + 4 =	8	31 and 2 make	23	42 + 4 =
9	23 and 3 make	24	40 + 1 =	9	24 and 2 make	24	30 + 1 =
10	44 and 3 make	25	45 + 2 =	10	43 and 2 make	25	26 + 2 =
11	22 and 4 make	26	44 + 4 =	11	32 and 3 make	26	33 + 4 =
12	30 and 1 make	27	32 + 1 =	12	24 and 4 make	27	25 + 2 =
13	42 and 2 make	28	33 + 2 =	13	21 and 4 make	28	33 + 5 =
14	45 and 2 make	29	43 + 4 =	14	44 and 3 make	29	42 + 4 =
15	31 and 7 make	30	25 + 2 =	15	20 and 3 make	30	29 + 1 =

Can you add on the ones to the ones?

Name _____ Date _____

Add or subtract. Then write two more related problems for each basic fact.

1. $2 + 4 = \underline{\quad}$

2. $6 - 4 = \underline{\quad}$

$12 + 4 = \underline{\quad}$

$36 - 4 = \underline{\quad}$

$22 + 4 = \underline{\quad}$

$56 - 4 = \underline{\quad}$

Add or subtract. Make number bonds to break apart the tens and ones.

3. $2 + 5 = \underline{\quad}$

4. $7 - 5 = \underline{\quad}$

5. $12 + 5 = \underline{\quad}$

6. $27 - 5 = \underline{\quad}$

7. $32 + 5 = \underline{\quad}$

8. $47 - 5 = \underline{\quad}$

9. $72 + 5 = \underline{\quad}$

10. $87 - 5 = \underline{\quad}$

11. $3 + 7 = \underline{\quad}$

12. $10 - 7 = \underline{\quad}$

13. $13 + 7 = \underline{\quad}$

14. $20 - 7 = \underline{\quad}$

15. $33 + 7 = \underline{\quad}$

16. $50 - 7 = \underline{\quad}$

17. $53 + 7 = \underline{\quad}$

18. $70 - 7 = \underline{\quad}$

19. Fifty-six people visited the museum for a tour. Nine people left before the tour was over. How many people stayed for the whole tour?

Create at least two more sets of problems if you finish early.

Name _____

Date _____

Solve the problems. In the space provided, write a related problem for each of the basic facts.

1. $4 + 2 = \underline{\quad}$

$24 + 2 = \underline{\quad}$

$84 + 2 = \underline{\quad}$

2. $6 - 4 = \underline{\quad}$

$36 - 4 = \underline{\quad}$

$76 - 4 = \underline{\quad}$

3. $1 + 9 = \underline{\quad}$

$11 + 9 = \underline{\quad}$

$61 + 9 = \underline{\quad}$

Name _____

Date _____

Add or subtract. Then write two more related problems for each basic fact.

1. $6 + 2 = \underline{\quad}$

$16 + 2 = \underline{\quad}$

$26 + 2 = \underline{\quad}$

2. $8 - 6 = \underline{\quad}$

$28 - 6 = \underline{\quad}$

$38 - 6 = \underline{\quad}$

3. $4 + 3 = \underline{\quad}$

$44 + 3 = \underline{\quad}$

$74 + 3 = \underline{\quad}$

4. $7 - 3 = \underline{\quad}$

$57 - 3 = \underline{\quad}$

$77 - 3 = \underline{\quad}$

5. $5 + 2 = \underline{\quad}$

6. $7 - 2 = \underline{\quad}$

$35 + 2 = \underline{\quad}$

$57 - 2 = \underline{\quad}$

$75 + 2 = \underline{\quad}$

$67 - 2 = \underline{\quad}$

Solve the following problems. Show your number bonds. Draw if that will help you.

7. $20 - 6 = \underline{\quad}$

8. $30 - 5 = \underline{\quad}$

9. $49 - 6 = \underline{\quad}$

10. $69 - 6 = \underline{\quad}$

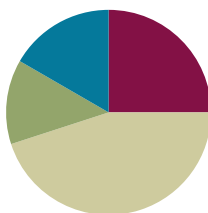
11. Seventy-nine people attended the concert. Six people had to leave at the break. How many people were still at the concert after the break?

Lesson 7

Objective: Add within 100 using properties of addition to make a ten.

Suggested Lesson Structure

■ Fluency Practice	(15 minutes)
■ Concept Development	(27 minutes)
■ Application Problem	(8 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (15 minutes)

- Break Apart by Tens and Ones **2.NBT.1** (3 minutes)
- Take from 20 **2.OA.2** (5 minutes)
- Up to the Next Ten with Number Sentences **2.NBT.5** (5 minutes)
- Two More **2.OA.2** (2 minutes)

Break Apart by Tens and Ones (3 minutes)

Note: Students need to build an understanding of place value relationships. In time, challenge students by asking, “6 ones 3 tens” with students correctly replying “36.”

T: If I say 42, you say 4 tens 2 ones.

T: If I say 4 tens 2 ones, you say 42.

T: 4 tens 2 ones.

S: 42.

T: 56.

S: 5 tens 6 ones.

T: 7 tens 3 ones.

S: 73.

Continue with the following possible sequence: 67, 54, 49, 71, and 88.

Take from 20 (5 minutes)

Materials: (S) Personal white boards

Note: Students use personal white boards to see the connection between taking from ten and taking from a multiple of ten.

T: I say 2, you say 8, to take the number I say from 10. Then, write the number sentence and wait for my signal to show it.

T: 6.

S: 4. (Write number sentence.)

T: Show your board.

S: (Show $10 - 6 = 4$.)

Continue with the following possible sequence: 7, 9, and 5.

T: This time instead of taking from 10, let's take from 20. Ready?

T: 1.

S: 19. (Write number sentence.)

T: Show your board.

S: (Show $20 - 1 = 19$.)

Continue with the following possible sequence: 5, 6, 8, and 3.

Up to the Next Ten with Number Sentences (5 minutes)

Note: Students remember the importance of their make ten facts with larger numbers. By saying *up* it indicates an addition sentence.

T: If I say, "18 up," you say "2."

T: If I say, "Give me the number sentence," you say, " $18 + 2 = 20$." Ready?

T: 7 up.

S: 3.

T: Give me the number sentence.

S: $7 + 3 = 10$.

T: 17 up.

S: 3.

T: Give me the number sentence.

S: $17 + 3 = 20$.

Continue with the following possible sequence: 57 up, 97 up, 6 up, 4 up, 26 up, 24 up, 54 up, 74 up, 1 up, 9 up, 31 up, 61 up, and 81 up.



**NOTES ON
MULTIPLE MEANS OF
ACTION AND
EXPRESSION:**

During Fluency Practice, provide a variety of ways for students to respond: oral, choral, student personal white boards for number sentences, concrete models (e.g., fingers, Rekenrek), or pictorial models (e.g., ten-frame). Vary choral response with written response on student boards to support English language learners. Model how the use of the ten-frame can help students answer problems such as *57 up*.

Two More (2 minutes)

Note: Students are eased into crossing multiples of ten by asking for just 2 more.

T: For every number I say, you will say what number is 2 more. If I say 2, you say 4. Ready? 3.

S: 5.

Continue with the following possible sequence: 6, 9, 8, 18, 38, 58, 78, 9, 19, 39, 59, and 79.

Concept Development (27 minutes)

Materials: (T) Ten-frame cards showing 10 (Lesson 3 Template), two-sided counters (S) Personal white board

Note: This lesson focuses on addition of two-digit and one-digit numbers crossing multiples of 10 (e.g., $38 + 4$, $47 + 6$, $78 + 5$, $5 + 78$).

T: (Present 12 counters as shown at right.)

T: $7 + 3$ (pause and point) $+ 2$ is...?

S: 12.

T: $7 + 5$ is...?

S: 12.

T: (Lay down a ten-frame card.) $17 + 3$ (pause) $+ 2$ is...?

S: 22.

T: $17 + 5$ is...?

S: 22.

T: $5 + 17$ is...?

S: 22.

T: (Lay down a ten-frame card.) $27 + 3$ (pause) $+ 2$ is...?

S: 32.

T: $27 + 5$ is...? Let's read them the Say Ten way.

S: $7 + 5 = 1$ ten 2. 1 ten $7 + 5 = 2$ tens 2, 2 tens $7 + 5 = 3$ tens 2.

T: What basic fact was used in all three problems?

S: $7 + 5 = 12$.

T: On your personal white boards, work with me to solve $87 + 5$ without materials. First, bond 87 as 80 and 7.

S: (Write the bond.)

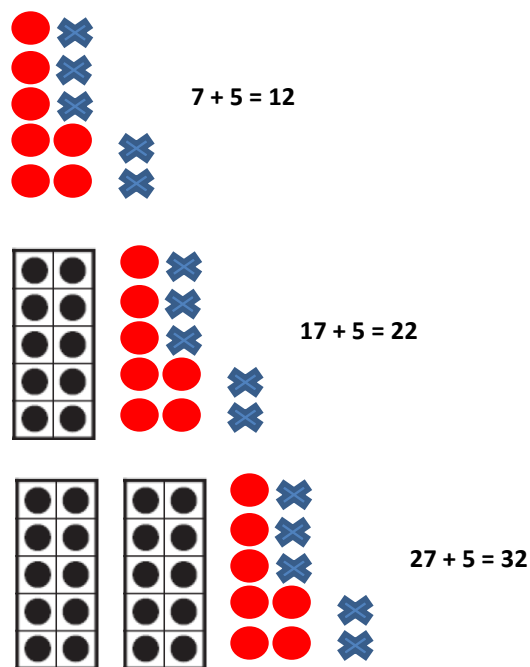
T: How did we bond 5 to make a ten (point to the materials)?

S: 3 and 2.

T: Excellent. 7 needs 3 to make ten. Show me that second bond.

S: (Write the bond.)

T: We end up with $80 + 7 + 3 + 2$. The answer is...?



$$\begin{array}{r} 87 + 5 = 92 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 80 \quad 7 \quad 3 \quad 2 \end{array}$$

S: 92.

T: Talk to your partner about how you know.

S: $7 + 3$ is 10, so it's $80 + 10 + 2$, 92. \rightarrow I know $7 + 5$ is 12, so $80 + 12$ is 92. \rightarrow I counted on, 80, 90, 92.

T: Try using the same strategy to solve $18 + 6$ on your personal white board. Share if you get stuck.

Note: As students work, provide new problems as needed, varying the basic fact and increasing the number of tens for some students (e.g., $15 + 6$, $45 + 6$, $5 + 76$, $4 + 87$) while giving the same basic fact and staying under 5 tens for others who need more practice at a simpler level (e.g., $19 + 3$, $29 + 3$, $39 + 3$). It is wise to use the personal white board rather than pencil and paper at times as students are advancing into more challenging territory. Work can quickly be erased and corrected, making error correction easy and more conducive to perseverance.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Application Problem (8 minutes)

One box fits exactly 10 cans. On Monday, Maria packed (18, 78) (see Multiple Means Note) cans into boxes, making sure to fill a box before beginning a new one. On Tuesday she added 6 more cans.

- How many boxes were completely filled then?
- How many cans did Maria pack in all?
- Extension: How many more cans did Maria need to fill another box?

$18 + 6 = 24$
 $24 + 6 = 30$
 $10 + 10 + 4 = 24$

a. 2 boxes were filled.
 b. Maria packed 24 cans in all.
 c. Maria needed 6 more cans to fill another box.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

“(18,78)” is an invitation to choose numbers that are appropriate for different learners. Students may lack wisdom in their choice of numbers. Better to initially guide them towards the right choice for the skill set, with the understanding that we are coaching them towards becoming wiser choosers.

Extension problems are always accommodations for early finishers and advanced learners.

Note: In this problem, students apply the strategy they learned in today’s lesson, using basic facts to bond and make a ten when crossing multiples of ten. Students who are able to work without support may choose to solve for the larger number, 78, while the teacher guides others using the smaller number, 18.

Student Debrief (10 minutes)

Lesson Objective: Add within 100 using properties of addition to make a ten.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- How does knowing $8 + 2$ make 10 help you solve $78 + 4$?
- Look at Problems 1 and 2. What is the relationship between $78 + 4$ and $58 + 5$?
- How did the basic fact $6 + 8$ help you solve Problems 4 and 5?
- How does a ten-frame model help us with learning to complete a 10 to add numbers to 100?
- Think about our story problem with the cans and the way that we solved problems with the ten-frame model. Partner B, explain to Partner A how the problems are the same.

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 7 Problem Set 2•1

Name Sydney Date _____

Solve the following problems. Draw your number bonds.

1. $78 + 4 = 82$
 $\begin{array}{c} \wedge \\ 70 \quad 8 \quad 2 \quad 2 \\ 70 + 10 + 2 \\ 80 + 2 \end{array}$

2. $58 + 5 = 63$
 $\begin{array}{c} \wedge \\ 50 \quad 8 \quad 2 \quad 3 \\ 50 + 10 + 3 \\ 60 + 3 \end{array}$

3. $54 + 6 = 60$
 $\begin{array}{c} \wedge \\ 50 \quad 4 \\ 50 + 10 \end{array}$

4. $88 + 2 = 90$
 $\begin{array}{c} \wedge \\ 80 \quad 8 \\ 80 + 10 \end{array}$

5. $26 + 8 = 34$
 $\begin{array}{c} \wedge \\ 20 \quad 6 \quad 4 \quad 4 \\ 20 + 10 + 4 \\ 30 + 4 \end{array}$

6. $48 + 6 = 54$
 $\begin{array}{c} \wedge \\ 40 \quad 8 \quad 2 \quad 4 \\ 40 + 10 + 4 \\ 50 + 4 \end{array}$

7. Fill in the blanks to make the number sentences true.

a. $9 + 1 = 10$
 $10 + 2 = 12$
 $19 + 3 = 22$
 $49 + 3 = 52$
 $69 + 3 = 72$
 $89 + 3 = 92$

b. $8 + 2 = 10$
 $10 + 5 = 15$
 $8 + 7 = 15$ $2 + 5$
 $28 + 2 = 30$
 $30 + 5 = 35$
 $28 + 7 = 35$ $2 + 5$

COMMON CORE Lesson 7: Add within 100 using properties of addition to make a ten. 4/26/14 engage^{ny} 1.C.21

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NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 7 Problem Set 2•1

Label each number sentence as true or false.

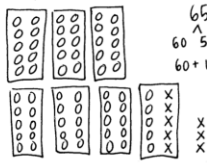
8. $22 + 8 = 20 + 10$ true
 $\begin{array}{c} \wedge \\ 20 \quad 2 \\ 20 + 10 \end{array}$

9. $57 + 5 = 50 + 10 + 2$ true
 $\begin{array}{c} \wedge \\ 50 \quad 7 \quad 2 \\ 50 + 10 + 2 \end{array}$

10. $83 + 9 = 80 + 10 + 1$ false
 $\begin{array}{c} \wedge \\ 80 \quad 3 \quad 1 \quad 2 \\ 80 + 2 + 10 \end{array}$

11. $68 + 7 = 70 + 5$ true
 $\begin{array}{c} \wedge \\ 60 \quad 8 \quad 2 \quad 5 \\ 60 + 10 + 5 \end{array}$

12. $88 + 9 = 90 + 6$ false
 $\begin{array}{c} \wedge \\ 80 \quad 8 \quad 2 \quad 7 \\ 80 + 10 + 7 \end{array}$

13. Jorge saved 65 dollars last month. This month he saved 8 more dollars. How much money does he have now?
 $\begin{array}{c} 65 + 8 \\ 60 \quad 5 \quad 5 \quad 3 \\ 60 + 10 + 3 = 73 \end{array}$

 Jorge has saved 73 dollars.

COMMON CORE Lesson 7: Add within 100 using properties of addition to make a ten. 4/26/14 engage^{ny} 1.C.22

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Name _____

Date _____

Solve the following problems. Draw your number bonds.

1. $78 + 4 = \underline{\hspace{2cm}}$



2. $58 + 5 = \underline{\hspace{2cm}}$

3. $54 + 6 = \underline{\hspace{2cm}}$

4. $88 + 2 = \underline{\hspace{2cm}}$

5. $26 + 8 = \underline{\hspace{2cm}}$

6. $48 + 6 = \underline{\hspace{2cm}}$

7. Fill in the blanks to make the number sentences true.

a. $9 + 1 = \underline{\hspace{2cm}}$

$10 + 2 = \underline{\hspace{2cm}}$

$19 + 3 = \underline{\hspace{2cm}}$

$49 + 3 = \underline{\hspace{2cm}}$

$69 + 3 = \underline{\hspace{2cm}}$

$89 + 3 = \underline{\hspace{2cm}}$

b. $8 + \underline{\hspace{2cm}} = 10$

$10 + \underline{\hspace{2cm}} = 15$

$8 + \underline{\hspace{2cm}} = 15$

$28 + \underline{\hspace{2cm}} = 30$

$30 + \underline{\hspace{2cm}} = 35$

$28 + \underline{\hspace{2cm}} = 35$

Label each number sentence as true or false.

8. $22 + 8 = 20 + 10$ _____

9. $57 + 5 = 50 + 10 + 2$ _____

10. $83 + 9 = 80 + 10 + 1$ _____

11. $68 + 7 = 70 + 5$ _____

12. $88 + 9 = 90 + 6$ _____

13. Jorge saved 65 dollars last month. This month he saved 8 more dollars. How much money does he have now?

Name _____

Date _____

Solve the following problems. Draw your number bonds.

1. $28 + 4 = \underline{\hspace{2cm}}$



2. $39 + 4 = \underline{\hspace{2cm}}$

3. $27 + 9 = \underline{\hspace{2cm}}$

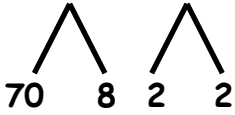
4. $38 + 9 = \underline{\hspace{2cm}}$

Name _____

Date _____

Solve the following problems. Draw your number bonds.

1. $78 + 4 = \underline{\hspace{2cm}}$



2. $58 + 5 = \underline{\hspace{2cm}}$

3. $36 + 6 = \underline{\hspace{2cm}}$

4. $26 + 7 = \underline{\hspace{2cm}}$

5. $23 + 9 = \underline{\hspace{2cm}}$

6. $44 + 9 = \underline{\hspace{2cm}}$

7. $47 + 8 = \underline{\hspace{2cm}}$

8. $68 + 8 = \underline{\hspace{2cm}}$

9. $89 + 8 = \underline{\hspace{2cm}}$

10. $77 + 9 = \underline{\hspace{2cm}}$

Label each number sentence as true or false.

11. $38 + 2 = 30 + 10$ _____

12. $57 + 5 = 50 + 10 + 2$ _____

13. $83 + 9 = 80 + 10 + 1$ _____

14. $64 + 7 = 70 + 1$ _____

15. $89 + 9 = 90 + 7$ _____

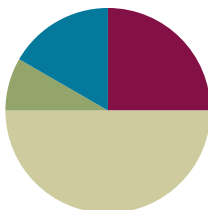
16. Anthony found 48 coins last month. This month he found 7 more coins. How many coins does he have now?

Lesson 8

Objective: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems.

Suggested Lesson Structure

■ Fluency Practice	(15 minutes)
■ Concept Development	(30 minutes)
■ Application Problem	(5 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)



Fluency Practice (15 minutes)

- Sprint: Make a Ten **2.OA.2** (9 minutes)
- Take from 20 **2.OA.2** (3 minutes)
- Subtract 1 from Multiples of 10 **2.OA.2** (3 minutes)

Sprint: Make a Ten (9 minutes)

Materials: (S) Make a Ten Sprint

Note: Students should develop automaticity to fluently make a ten when adding.

Take from 20 (3 minutes)

Materials: (S) Personal white boards

Note: Students use personal white boards to see the connection between taking from ten and taking from a multiple of ten. As students show comprehension of the skill, practice orally without the personal boards.

- T: I say 3, you say 7, to take the number I say from 10. Write the number sentence and wait for my signal to show it.
- T: 8.
- S: 2. (Write number sentence.)
- T: Show your personal boards.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Adjust the lesson times as needed. Consider omitting the Sprint in order to have sufficient time for the Concept Development portion. Or, complete the first half of the Concept Development, subtracting from multiples of ten, and save the balance of the lesson for inclusion in fluency activities throughout the rest of the year.

S: (Show $10 - 8 = 2$.)

Continue with the following possible sequence: 4, 5, and 9.

T: This time instead of taking from 10, let's take from 20. Ready? 1.

S: 19. (Write number sentence.)

T: Show your personal board.

S: (Show $20 - 1 = 19$.)

Continue with the following possible sequence: 3, 2, 5, 0, 6, 8, 7, and 9.

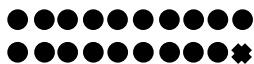
Subtract 1 from Multiples of 10 (3 minutes)

Materials: (T) Drawings on the board should be sufficient.
Cover rows and reveal them as the numbers grow.

Note: This fluency sequence assures that students can change from 30 to 29, 40 to 39. In Say Ten counting, the count goes from "3 tens" to "2 tens 9," or "4 tens" to "3 tens 9." Continue through $100 - 1$. Consider doing the problems in order at first and then jumble the sequence.

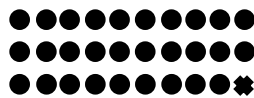


$$10 - 1 = 9$$



$$20 - 1 = 19$$

"2 tens - 1 is 1 ten 9."



$$30 - 1 = 29$$

"3 tens - 1 is 2 tens 9."



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Coupled with Say Ten counting, these representations help students to understand the unit changes occurring at the tens. Connect Say Ten language with models such as the 100-bead Rekenrek.

Concept Development (30 minutes)

Materials: (T) Two-sided counters, ten-frame cards showing 10 (Lesson 3 Template)
(S) Personal white boards

Part 1: Subtract single-digit numbers from multiples of 10 through 100.

T: Present 10 counters (as shown below).

T: $10 - 3$ is...?

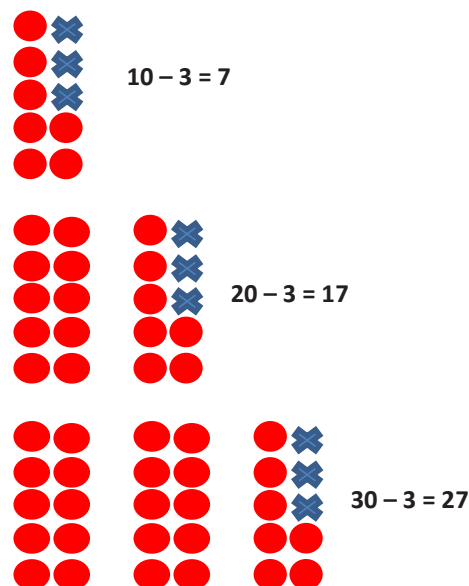
S: 7.

T: (Lay down a ten-frame card.) $10 + 7$ is...?

S: 17.

T: $20 - 3$ is...?

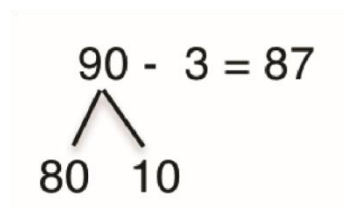
- S: 17.
 T: $10 + 10 - 3$ is...?
 S: 17.
 T: (Lay down a ten-frame card.) $20 + 7$ is...?
 S: 27.
 T: $30 - 3$ is...?
 S: 27.
 T: $20 + 10 - 3$ is...?
 S: 27.
 T: Explain to your partner how $10 - 3$ helps us to solve $30 - 3$. Use the model to help you.
 S: They're the same, but 30 has 2 more tens. \rightarrow 10 is inside 30 so you take from the ten. \rightarrow It's the same as $20 + 10 - 3$.



Following the work with manipulatives, model how to draw the number bond in order to solve the problems. Take the 3 from the ten.

Give the students a variety of problems from simple to complex. Use this possible sequence: $20 - 1$, $20 - 5$, $30 - 6$, $40 - 6$, $50 - 4$, $60 - 3$, $70 - 2$, $80 - 8$, $100 - 8$. Conclude with a brief discussion about the helpfulness of the structure.

- T: $90 - 3 = 87$. Discuss with your partner how $10 - 3$ helps to solve $90 - 3$. Use a drawing or materials that will help you to explain clearly.
 T: $60 - 8$ can be solved using the same way of thinking. Can you write and solve other problems that can be solved this way, too?



Part 2: Subtract single-digit numbers from multiples of 10 with some ones.

Note: Students continue to take from the 10 to subtract, with the added complexity of adding some ones back in. This enables students to see the pattern and gain a deeper understanding of how the structure of 10 can be used to make problem solving easier. When students count back to execute this process, it is very hard to see the simplicity of the pattern.

- T: Present 11 counters (as shown below).
 T: $10 - 5$ (pause and point) $+ 1$ is...?
 S: 6.
 T: $11 - 5$ is...?
 S: 6.
 T: (Lay down a ten-frame card.) $20 - 5$ is...?
 S: 15.

T: $20 - 5 + 1$ is...?

S: 16.

T: $21 - 5$ is...?

S: 16.

T: (Lay down a ten-frame card.) $30 - 5$ is...?

S: 25.

T: $30 - 5 + 1$ is...?

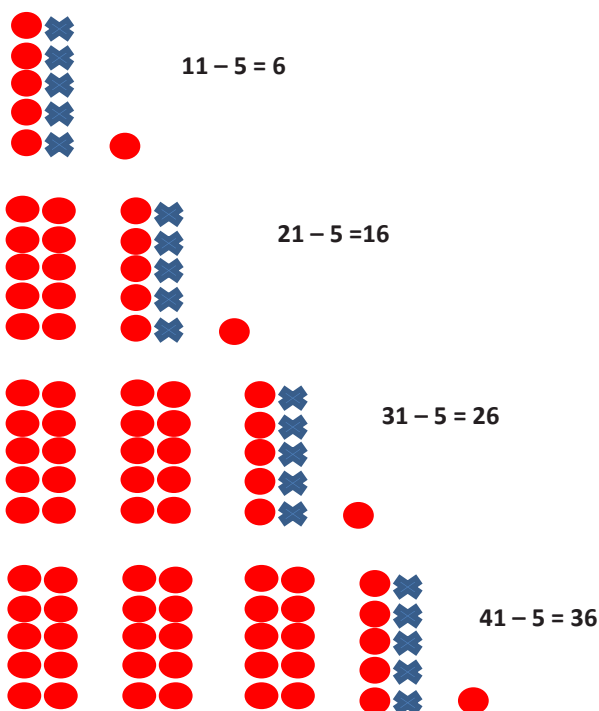
S: 26.

T: $31 - 5$ is...?

S: 26.

T: Explain to your partner how $10 - 5$ helps us to solve $21 - 5$. Use the model to help you.

S: I can break 21 into 11 and 10 and then I just take 5 from 10, and add 11 to the answer. \rightarrow I know $10 - 5$ is 5, so $20 - 5$ is 15, then $21 - 5$ is 16.



Part 3: Practice on personal white boards.

Note: Allow time for students to work on their personal boards, with manipulatives as needed, so that they practice many problems. As students demonstrate proficiency, allow them to work on the Problem Set.

T: $91 - 5 = 86$. Show your partner how you know that is true. Use your words, number bonds, and models to prove it. How might you solve $23 - 9$ using the same process?

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Application Problem (5 minutes)

Kayla has 21 stickers. She gives Sergio 7 stickers. How many stickers does she have left?

T: Let's read the problem together.

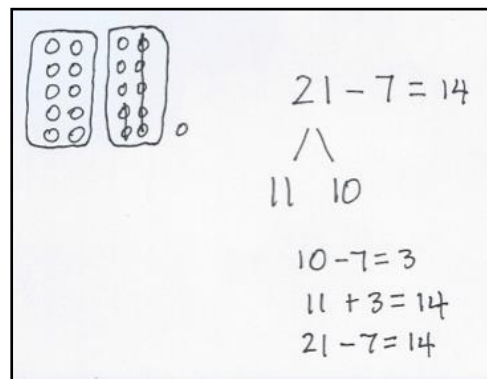
T: What is the problem asking you to find?

S: How many stickers Kayla has left.

T: Are we given the total and one part, or do we know both parts?

S: The total and one part.

T: What is the total?



- S: 21.
 T: What is the part?
 S: 7.
 T: Talk with your partner: What can you draw that will help you see the information in the problem?
 S: I can draw circles like on the ten-frame cards. → I can draw a number bond.
 T: (Give students a minute to make their drawings on their personal boards.)
 T: How can I find the difference?
 S: Subtract!
 T: Can I use the strategy we learned today to solve?
 S: Yes! Subtract from the ten.
 T: (Circulate as students solve and show their work. Choose one or two pieces of student work to share with the class. Ask the students to share the strategies they used to solve.)

Note: This Application Problem is an extension of the Concept Development wherein students decompose to subtract from a ten. While the vignette guides students to use the strategy of subtracting from the ten using ten frames and number bonds, accept all work that students can rationally explain.

Student Debrief (10 minutes)

Lesson Objective: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

MP.7

- In the Problem Set, how does $20 - 8$ help you solve $21 - 8$?
- How does $21 - 8$ help solve $32 - 8$?
- How did the basic fact $10 - 8 = 2$ help you solve $21 - 8$ and $32 - 8$?
- How do number bonds help you solve subtraction problems?
- What was the focus of our lesson today?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 8 Problem Set 2•1

Name Alex Date _____

Fill in the blanks to make the number sentences true. Draw number bonds to help you subtract from the ten. The first two are done for you.

1. $40 - 8 = 32$ $\begin{array}{c} \wedge \\ 30 \quad 10 \end{array}$	2. $41 - 8 = 33$ $\begin{array}{c} \wedge \\ 31 \quad 10 \\ 31+2 \end{array}$
3. $20 - 8 = 12$ $\begin{array}{c} \wedge \\ 10 \quad 10 \\ 10+2 \end{array}$	4. $21 - 8 = 13$ $\begin{array}{c} \wedge \\ 11 \quad 10 \\ 11+2 \end{array}$
5. $30 - 8 = 22$ $\begin{array}{c} \wedge \\ 20 \quad 10 \\ 20+2 \end{array}$	6. $32 - 8 = 24$ $\begin{array}{c} \wedge \\ 22 \quad 10 \\ 22+2 \end{array}$
7. $90 - 8 = 82$ $\begin{array}{c} \wedge \\ 80 \quad 10 \\ 80+2 \end{array}$	8. $91 - 8 = 83$ $\begin{array}{c} \wedge \\ 81 \quad 10 \\ 81+2 \end{array}$
9. $20 - 9 = 11$ $\begin{array}{c} \wedge \\ 10 \quad 10 \\ 10+1 \end{array}$	10. $22 - 9 = 13$ $\begin{array}{c} \wedge \\ 12 \quad 10 \\ 12+1 \end{array}$
11. $70 - 9 = 61$ $\begin{array}{c} \wedge \\ 60 \quad 10 \\ 60+1 \end{array}$	12. $71 - 9 = 62$ $\begin{array}{c} \wedge \\ 61 \quad 10 \\ 61+1 \end{array}$
13. $40 - 5 = 35$ $\begin{array}{c} \wedge \\ 30 \quad 10 \\ 30+5 \end{array}$	14. $42 - 5 = 37$ $\begin{array}{c} \wedge \\ 32 \quad 10 \\ 32+5 \end{array}$

COMMON CORE Lesson 8: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems. 5/5/14 engage ny 1.C.3.3

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Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 8 Problem Set 2•1

15. Marisol solved $60 - 2$. What numbers complete the number bond to show how she used "take from 10"?


$$\begin{array}{c} 60 - 2 = 58 \\ \swarrow \searrow \\ 50 \quad 10 \end{array}$$

(a) 50, 10 b. 60, 0 c. 54, 6 d. 58, 2

16. Carla has 70 paper clips. She gives 6 away. Write a number sentence that shows how many paper clips Carla has left.

$$\begin{array}{c} 70 \\ \underline{- 6} \\ 64 \end{array}$$


17. Isaac has 61 pencils. He gives 8 pencils to a friend. How many pencils does Isaac have left? Draw a picture and write a number sentence to show how you know.




$$\begin{array}{c} 61 - 8 = 53 \\ \underline{51 \quad 10} \\ 51 + 2 = 53 \end{array}$$

Isaac has 53 pencils left.

18. Use drawings to explain how to find $31 - 8$ and $43 - 8$.



$$\begin{array}{c} 31 - 8 = 23 \\ \underline{21 \quad 10} \\ 21 + 2 = 23 \end{array}$$


$$\begin{array}{c} 43 - 8 = 35 \\ \underline{33 \quad 10} \\ 33 + 2 = 35 \end{array}$$

COMMON CORE Lesson 8: Decompose to subtract from a ten when subtracting within 100 and apply to one-step word problems. Date: 5/5/14 engage^{ny} 1.C.34

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Do as many as you can in 60 seconds.

Do as many as you can in 60 seconds.

1	9 and 1 is ____	16	$9 + 1 =$	1	8 and 2 is ____	16	$8 + 2 =$
2	1 more than 9 is ____	17	$9 + 1 + 2 =$	2	2 more than 8 is ____	17	$8 + 2 + 2 =$
3	$9 + \underline{\hspace{1cm}} = 10$	18	$9 + 3 =$	3	$8 + \underline{\hspace{1cm}} = 10$	18	$8 + 4 =$
4	$9 + 1 + 1 = \underline{\hspace{1cm}}$	19	$10 + 3 =$	4	$8 + 2 + 1 = \underline{\hspace{1cm}}$	19	$10 + 2 =$
5	$10 + 1 =$	20	$10 + 4 =$	5	$10 + 1 =$	20	$10 + 3 =$
6	$9 + 2 =$	21	$10 + 5 =$	6	$8 + 3 =$	21	$10 + 4 =$
7	$2 + 9 =$	22	$9 + 1 + 5 =$	7	$3 + 8 =$	22	$8 + 2 + 4 =$
8	$9 + 3 =$	23	$9 + 5 =$	8	$8 + 3 =$	23	$8 + 6 =$
9	$9 + 4 =$	24	$5 + 9 =$	9	$8 + 4 =$	24	$6 + 8 =$
10	$9 + 1 + 3 =$	25	$9 + 6 =$	10	$8 + 2 + 3 =$	25	$8 + 6 =$
11	$9 + 4 =$	26	$10 + 6 =$	11	$8 + 5 =$	26	$10 + 6 =$
12	$4 + 9 =$	27	$9 + 1 + 6 =$	12	$5 + 8 =$	27	$8 + 2 + 6 =$
13	$9 + 1 =$	28	$9 + 7 =$	13	$8 + 2 =$	28	$8 + 8 =$
14	$10 + 4 =$	29	$7 + 9 =$	14	$10 + 4 =$	29	$8 + 9 =$
15	$9 + 4 =$	30	$8 + 9 =$	15	$8 + 4 =$	30	$9 + 8 =$

Can you use the ten to make these sums easy?

Name _____

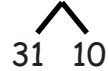
Date _____

Fill in the blanks to make the number sentences true. Draw number bonds to help you subtract from the ten. The first two are done for you.

1. $40 - 8 = 32$



2. $41 - 8 = \underline{\hspace{2cm}}$



3. $20 - 8 = \underline{\hspace{2cm}}$

4. $21 - 8 = \underline{\hspace{2cm}}$

5. $30 - 8 = \underline{\hspace{2cm}}$

6. $32 - 8 = \underline{\hspace{2cm}}$

7. $90 - 8 = \underline{\hspace{2cm}}$

8. $91 - 8 = \underline{\hspace{2cm}}$

9. $20 - 9 = \underline{\hspace{2cm}}$

10. $22 - 9 = \underline{\hspace{2cm}}$

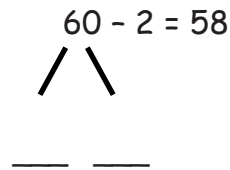
11. $70 - 9 = \underline{\hspace{2cm}}$

12. $71 - 9 = \underline{\hspace{2cm}}$

13. $40 - 5 = \underline{\hspace{2cm}}$

14. $42 - 5 = \underline{\hspace{2cm}}$

15. Marisol solved $60 - 2$. What numbers complete the number bond to show how she used "take from 10"?



- a. 50, 10 b. 60, 0 c. 54, 6 d. 58, 2
16. Carla has 70 paper clips. She gives 6 away. Write a number sentence that shows how many paper clips Carla has left.

_____ - _____ = _____

17. Isaac has 61 pencils. He gives 8 pencils to a friend. How many pencils does Isaac have left? Draw a picture and write a number sentence to show how you know.

18. Use drawings to explain how to find $31 - 8$ and $43 - 8$.

Name _____

Date _____

Fill in the blanks to make the number sentences true. Draw number bonds to help you subtract from the ten.

1. $20 - 8 =$ _____

2. $60 - 5 =$ _____

3. $21 - 8 =$ _____

4. $62 - 5 =$ _____

Name _____

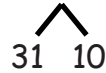
Date _____

Fill in the blanks to make the number sentences true. Draw number bonds to help you subtract from the ten. The first two are done for you.

1. $40 - 8 = 32$



2. $41 - 8 = \underline{\hspace{2cm}}$



3. $10 - 3 = \underline{\hspace{2cm}}$

4. $11 - 3 = \underline{\hspace{2cm}}$

5. $20 - 5 = \underline{\hspace{2cm}}$

6. $21 - 5 = \underline{\hspace{2cm}}$

7. $50 - 7 = \underline{\hspace{2cm}}$

8. $52 - 7 = \underline{\hspace{2cm}}$

9. $70 - 8 = \underline{\hspace{2cm}}$

10. $71 - 8 = \underline{\hspace{2cm}}$

11. $40 - 8 = \underline{\hspace{2cm}}$

12. $42 - 8 = \underline{\hspace{2cm}}$

13. $60 - 7 = \underline{\hspace{2cm}}$

14. $61 - 7 = \underline{\hspace{2cm}}$

15. $80 - 9 = \underline{\hspace{2cm}}$

16. $82 - 9 = \underline{\hspace{2cm}}$

17. Mary solved $40 - 6$. Which numbers complete the bond to show how she used "take from 10"?

$$\begin{array}{r} 40 - 6 = 34 \\ \swarrow \searrow \\ \underline{\quad} \quad \underline{\quad} \end{array}$$

- a. 3, 3 b. 40, 10 c. 30, 6 d. 30, 10
18. Anne finds 41 leaves. She drops 3. Write a number sentence that shows how many leaves are left.

$$\underline{\quad\quad\quad} - \underline{\quad\quad\quad} = \underline{\quad\quad\quad}$$

19. Dane has 22 cans. His mother took 5 cans. How many cans does Dane have left? Draw a picture and write a number sentence to show how you know.

Name _____

Date _____

1. a. Write the numbers to make each number sentence true.

$6 + 4 + 2 = \underline{\quad} + 2$

$10 + 3 = \underline{\quad} + 3 + 3$

$16 = \underline{\quad} + 8 + 6$

- b. Label each number sentence true or false.

$8 + 3 = 10 + 1$ _____

$7 + 6 = 10 + 4$ _____

$4 + 8 = 5 + 9$ _____

$7 + 8 = 9 + 6$ _____

- c. Use drawings, words, or numbers to show why $18 - 3 = 15$ and $10 + 5 = 15$ have the same answer.

2. Use number bonds to solve.

$38 + 6 =$

$60 - 4 =$

$74 + 9 =$

$53 - 7 =$

3. Trevor's mom gave him 6 stickers to start his collection. He received 85 more for his birthday.
- a. Use words, pictures, or numbers to show how many stickers Trevor has now.
- b. James has 95 stickers and gives away 7. How many stickers does James have now?
- c. Who has more stickers now, James or Trevor?

4. Mr. Garcia checked out 27 library books for his class. The class read some the first month and the remaining 9 books the second month.
- Use words, pictures, or numbers to find out how many books the class read in the first month.
 - During the third month, Mr. Garcia checked out 8 more books and his class read them all. Use words, pictures, or numbers to show how many library books Mr. Garcia's class read in all 3 months.

End-of-Module Assessment Task Standard Addressed

Topics A–C

Represent and solve problems involving addition and subtraction.

- 2.OA.1** Use addition and subtraction within 100 to solve one-and two-step problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See CCLS Glossary, Table 1.)

Add and subtract within 20.

- 2.OA.2** Fluently add and subtract within 20 using mental strategies. (See standard 1.OA.6 for a list of mental strategies.) By end of Grade 2, know from memory all sums of two one-digit numbers.

Use place value understanding and properties of operations to add and subtract.

- 2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student **CAN** do now and what they need to work on next.

A Progression Toward Mastery

Assessment Task Item and Standards Addressed	STEP 1 Little evidence of reasoning without a correct answer. (1 Point)	STEP 2 Evidence of some reasoning without a correct answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
1 2.OA.2 2.NBT.5	The student correctly solves one to three of the eight parts.	The student correctly solves four to five of the eight parts.	The student correctly solves six to seven of the eight parts.	Student correctly: <ol style="list-style-type: none"> Answers 10, 7, and 2. Answers <i>true</i> for the first and last problems. Answers <i>false</i> for the second and third problems. Uses drawings, words, or numbers to explain reasoning.
2 2.OA.2 2.NBT.5	The student correctly solves one to three of the eight parts.	The student correctly solves four to five of the eight parts.	The student correctly solves six to seven of the eight parts.	Student correctly: <ul style="list-style-type: none"> Draws a number bond to make a ten to solve $38 + 6 = 44$. Draws a number bond to take from ten to solve $60 - 4 = 56$. Draws a number bond to make a ten to solve $74 + 9 = 83$. Draws a number bond to take from ten to solve $53 - 7 = 46$.



A Progression Toward Mastery

3 2.OA.1 2.NBT.5	The student correctly solves one of the four parts.	The student correctly solves two of the four parts.	The student correctly solves three of the four parts.	The student correctly: <ol style="list-style-type: none"> Uses words, pictures, or numbers to solve $85 + 6 = 91$. Answers 88. Answers <i>Trevor</i>.
4 2.OA.1	The student correctly solves one of the four parts.	The student correctly solves two of the four parts.	The student correctly solves three of the four parts.	The student correctly: <ol style="list-style-type: none"> Uses words, pictures, or numbers to solve 18 books. Uses words, pictures, or numbers to solve 35 books.

Name Kylie Date _____

1. a. Write the numbers to make each number sentence true.

$$6 + 4 + 2 = \underset{\substack{\vee \\ 10}}{10} + 2$$

$$10 + 3 = \underset{\substack{\vee \\ 10}}{7} + 3 + 3$$

$$16 = \underset{\substack{\vee \\ 10}}{2} + 8 + 6$$

- b. Label each number sentence true or false.

$$\begin{array}{l} 8 + 3 = 10 + 1 \quad \text{true} \\ \quad \substack{2 \quad 1} \\ 7 + 6 = 10 + 4 \quad \text{false} \\ \quad \substack{3 \quad 3} \\ 4 + 8 = 5 + 9 \quad \text{false} \\ \substack{2 \quad 2 \quad 4 \quad 1} \\ 7 + 8 = 9 + 6 \quad \text{true} \\ \substack{5 \quad 2 \quad 1 \quad 3} \end{array}$$

- c. Use drawings, words, or numbers to show why $18 - 3 = 15$ and $10 + 5 = 15$ have the same answer.

$$\begin{array}{l} 18 - 3 = 15 \\ \substack{10 \quad 8} \\ 8 - 3 = 5 \\ 10 + 5 = 15 \end{array}$$

I know they are the same because the basic fact $8 - 3$ is 5 and then you add the 10 back in to get 15.

2. Use number bonds to solve.

$\begin{array}{l} 38 + 6 = 44 \\ \substack{2 \quad 4} \\ 38 + 2 = 40 \\ 40 + 4 = 44 \end{array}$	$\begin{array}{l} 60 - 4 = 56 \\ \substack{50 \quad 10} \\ 10 - 4 = 6 \\ 50 + 6 = 56 \end{array}$
--	---

$74 + 9 = 83$ $\begin{array}{r} \text{^} \\ 73 \end{array} 1$ $1 + 9 = 10$ $10 + 73 = 83$	$53 - 7 = 46$ $\begin{array}{r} \text{^} \\ 43 \end{array} 10$ $10 - 7 = 3$ $43 + 3 = 46$
--	--

3. Trevor's mom gave him 6 stickers to start his collection. He received 85 more for his birthday.

- a. Use words, pictures, or numbers to show how many stickers Trevor has now.

$$85 + 6 = 91$$

$$\begin{array}{r} \text{^} \\ 5 \end{array} 1$$

Trevor has 91 stickers.

$$85 + 5 = 90$$

$$90 + 1 = 91$$

- b. James has 95 stickers and gives away 7. How many stickers does James have now?

$$95 - 7 = 88$$

$$\begin{array}{r} \text{^} \\ 85 \end{array} 10$$

James has 88 stickers.

$$10 - 7 = 3$$

$$85 + 3 = 88$$

- c. Who has more stickers now, James or Trevor?

Trevor has more stickers
because 91 is more than 88.

4. Mr. Garcia checked out 27 library books for his class. The class read some the first month and the remaining 9 books the second month.
- a. Use words, pictures, or numbers to find out how many books the class read in the first month.

$$\begin{array}{r} 27 - 9 = 18 \\ 17 \quad \overset{\wedge}{10} \end{array}$$

The class read 18 books in the first month.

$$\begin{array}{l} 10 - 9 = 1 \\ 17 + 1 = 18 \end{array}$$

- b. During the third month, Mr. Garcia checked out 8 more books and his class read them all. Use words, pictures, or numbers to show how many library books Mr. Garcia's class read in all 3 months.

$$\begin{array}{r} 27 + 8 = 35 \\ 3 \quad \overset{\wedge}{5} \end{array}$$

Mr. Garcia's class read 35 books in 3 months.

$$\begin{array}{l} 27 + 8 = 35 \\ 30 + 5 = 35 \end{array}$$