Grade 1/2: Module 1: Lesson Demonstration
Concept: Number Bonds within 10 and Adding/Subtracting Across 10
3 Part Lesson
    Part 1: Fluency Work   (8 minutes)
    Part 2: Problem Solving   (12 minutes)
    Part 3: Content Lesson with Debrief   (30 minutes)

To the teacher: This lesson was designed to demonstrate the coherence of topics across grade levels, in this case to show the ways in which a 2nd grade concept is built upon the conceptual understanding students developed in 1st grade. Here, students meld their knowledge of number bonds within 10 and partners to 10 to successfully add and subtract across 10, a skill which will in turn lead to success in completing a unit in many different contexts.

Teacher	**Student Accommodations/Comments/Pictures**

Part 1: Fluency Focus: Plus 10, Partners to 10 (8 minutes)
Materials: 10 linker cubes per pair of students, personal white board, eraser,
           and marker for each student.

Students work at their tables.

Fluency Activity #1: Name the Hidden Part (2 minutes)
T: Everyone stand up and pair up with your closest neighbor.
T: One of you is Partner A. The other is Partner B.
T: Everyone who's Partner A, pick up a ten stick.
T: When I say, "Ready? Begin," Partner A, break your stick of 10 into 2 parts. Hide 1 part behind your back and show Partner B the other part.
T: Partner B, name the part that's hidden.
T: Does everyone understand? (Check for understanding.)
T: Switch roles back and forth. You have 1 minute. Ready? Begin! (After 1 minute)
T: Please sit down, put your linker cubes together, and put them back on the table.

To the teacher: First graders will be expected to master partners to 10, so in 2nd grade this activity will serve as a warm-up and a review.

Fluency Activity #2: Break Out 10 (2 minutes)
T: Now we're going to break out ten. For example, I say, "16." You say, "10 + 6." Ready?
T: 16. (Signal)
S: 10 + 6.
T: 11. (Signal)
S: 10 + 1.
T: 14. (Signal)
S: 10 + 4.
T: (Continue in this manner through all the combinations.) Excellent!

To the teacher: Fluency with *10* + is necessary for students to use the Make a Ten strategy.

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Fluency Activity #3: Take the 1 Out (3 minutes)
T: Let's play Take the 1 Out. You'll need your white board and marker.
T: If I say, "5." You write "1 + 4."
T: If I say, "7." You write "1 + 6."
T: Turn your board face down when you've written your answer. When I say, "Show me," hold your board in the air so I can see your work.
T: If your answer is correct I'll give you a thumbs-up. If you made a mistake I'll say, "Think about it." Ready?
T: 9. (Pause) Show me.
S: 1 + 8. (Check answers.) Erase your board.
T: 3. (Pause) Show me.
S: 1 + 2. (Check answers.) Erase your board.
Continue in this way but take out different numbers.
T: Take the 2 out.
T: 6.
S: 2 + 4.
T: 4.
S: 2 + 2.
T: Take the 3 out.
T: 8.
S: 3 + 5.
T: Fantastic! Cap your marker, erase your board, and let's stand up and stretch!

> *To the teacher:* When using personal white boards, designate one color as the writing side, so as students finish their work and turn their boards over you can easily see how many students need more time. When most of the class has flipped their board, say, "Show me." Students hold their boards in the air so you can see their work. Give each student the thumbs-up sign or say, "Try again" or "Think about it."

> *To the teacher:* Knowing number bonds within 10 is necessary for students to break apart 1 addend in order to make ten with the other addend. These 3 fluency activities are warming students up in the skills they will use in the content lesson.

Movement Piece (1 minute)
T: (Do it and have students follow along. They'll pick it up very quickly. This is a syncopated rhythm of a fast 8 count, with the beats on 1, 4, and 7.) Say it with me. Step, step, clap. Step, step, clap. Step, step, clap. Step, step, clap.
T: (With the movement) 3, 6, 9. 12, 15, 18. 21, 24, 27, 30. Louder. 3, 6, 9. 12, 15, 18. 21, 24, 27. 30. Louder! 3, 6, 9. 12, 15, 18. 21, 24, 27. 30. Bring it down softer. 3, 6, 9. 12, 15, 18. 21, 24, 27. 30. Whisper it. 3, 6, 9. 12, 15, 18. 21, 24, 27. 30.
T: Alright! Take a seat.

> *To the teacher:* Anytime you can incorporate music, movement, and rhythm into an activity, you create a memorable total body experience. The patterned recurrence of the beat triggers an undeniable pull in our brain and we remember what's attached to that beat, in this case, skip counting by 3s.

Part 2: Problem Solving (11 minutes)
Materials: Read, Draw, Write (RDW) Worksheet

T: (Pass out RDW 1. Project the problem on the board.)

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T: Read this problem with me.
S: 8 children are swimming in the pool. 5 more children jump in. How many children are in the pool now?
T: Reread the first sentence.
S: 8 children are swimming in the pool.
T: How can we show that? (Call on a volunteer.)
S: "We can draw 8 circles."
T: Let's do that. (Model and students copy.)
T: And let's draw a bar around those circles. (Draw it and students copy.)
T: Read the next sentence.
S: 5 more children jump in.
T: Are the 5 children joining (encircle arms in front of you to show coming together) or leaving (motion separation by pulling your hands apart?)
T: Talk with your partner, and raise your hand when you have your answer. (Signal)
S: "Joining!"
T: How can we show that in our picture? (Call on a volunteer.)
S: We can draw 5 more circles.
T: Excellent idea! Everybody do that. (Model and students copy.)
T: Now draw a bar around the 5 circles. (Model and students copy.)
T: Talk with your partner: Does the problem give us the whole or the parts? (Allow about 30 seconds, and then signal.)
S: The parts!
T: Correct! And you know we always label our drawings, so let's do that. (Draw the arms and numbers. Students copy.)
T: Read the question.
S: How many children are in the pool now?
T: We know the parts, so we're looking for…? (Signal)
S: The whole!
T: Let's label that. (Draw the arms and the question mark, students copy.)
T: Raise your hand when you know the number sentence to solve this problem. Don't tell me the answer, tell me the number sentence. (Signal)
S: $8 + 5 = $ blank.
T: Yes. Write the number sentence and solve. (Pause, then signal.)
T: Give me the complete number sentence. (Signal)
S: $8 + 5 = 13$.
T: So how many children are in the pool now? Give me the complete sentence. (Signal)
S: 13 children are in the pool!

To the teacher: In the progression of learning how to use bar models, students start by drawing circles to represent the unit they are working with (e.g. marbles, children, kittens). The next step is to have them draw a box around the circles. In subsequent lessons, subtly replacing the word *box* with *bar* while drawing it allows students to understand the new vocabulary through context. The last step is students drawing the bars without the circles.

To the teacher: The RDW part of this lesson assumes that problem solving is a daily practice, and that a part of that practice is drawing circles to represent units. This is math class, not art class, and we don't want to lose time while students draw 6 toy cars or 5 ducks! Another assumption is that students are well versed in the knowledge that *part + part = whole* and *whole – part = missing part*, and that those 2 statements are posted in the classroom.

III COMMON CORE

T: Yes! Talk with your partner: How does your picture help you see the answer to the question? (Allow about 1 minute, and then choose a volunteer.)

S: "I see the parts so I know how many children are in the pool."

T: Thank you. Can anyone add to that with a little more detail (with a wink at the part/whole statements)?

S: "It shows the 2 parts so I know I have to add them to find the whole."

T: You are correct! I like the way you used part/whole language to explain your thinking.

T: Put away your RDW and stand up for a stretch.

Movement Piece (1 minute)

T: We're going to punch the sky as we skip count by 5s, but instead of punching with a closed hand, a fist, we're going to punch with an open hand, showing 5. Ready?

S: (Punching and skip counting to 125.)

T: Alright! Sit back down.

Part 3: Content Lesson and Debrief (30 minutes)
Materials: 1 place value mat per pair, number disks per pair (3 tens, 11 ones),
            Learning Log, Activity Sheet, Exit Ticket

Students come to the carpet and sit in arrays.

"I do" (2 minutes)

T: 9 + 1? (Signal)

S: 10.

T: 9 + 1 + 4? (Signal)

S: 14.

T: 9 + 5? (Signal)

S: 14.

T: 8 + 2? (Signal)

S: 10.

T: 8 + 2 + 3? (Signal)

S: 13.

T: 8 + 5? (Signal)

S: 13.

T: 7 + 3 + 5? (Signal)

S: 15.

T: 7 + 8? (Signal)

To the teacher: Working from abstract to concrete to abstract within a lesson can send a powerful message to your students, signaling your confidence in them that they know a concept well. Next, let them prove what they just did in a concrete form, here, with number disks. Then push them to higher levels of understanding by having them extend the pattern.

IIII COMMON CORE

S: 15.

T: Talk with your partner: What strategy were you using that made it easy to add? Raise your hand when you know the answer.

S: "Partners to 10." "Make a 10."

T: Yes! Everyone hold up your magic counting sticks! (Hold up both hands and wiggle your fingers.)

T: Give each finger a value of 1. Wiggle each finger as we count it. When we get to 10, clasp your hands together with a loud smack. Ready?

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

T: Now open up your ten and show me: How many ones are inside a ten? (Signal)

S: (Opening their hands and wiggling ten fingers.) Ten!

T: Remember to always say the unit. Ten what?

S: Ten ones.

T: Of course! So now let's use what you know.

"We do" (10 minutes)

Materials: place value mat and number disks per pair, Learning Log   Students return to their tables.

T: (Write $8 + 5 = 10 + 3$, $18 + 5 = 20 + 3$, and $28 + 5 = 30 + 3$ on the board, with each problem

$$\wedge \qquad\qquad \wedge \qquad\qquad \wedge$$
$$2\ 3 \qquad\qquad 2\ 3 \qquad\qquad 2\ 3$$

written under the previous problem.)

> *To the teacher:* In a real-life sequence of lessons, students would move from a single digit problem like 8 + 5 to working on subtraction and addition from the teens. Then we would transition to the algorithm for 2- and 3-digit numbers through 1000 by year's end. This lesson is meant to span that progression, linking 1st and 2nd grade concepts and skills.

T: Talk with your partner: How are these problems related? What patterns do you see? How does the first problem help you solve the other 2 problems?

T: Raise your hand when you're ready to share. (Of course, there are many possible responses, but guide them to the Make a Ten strategy.)

T: Yes, making a ten is a very important concept. Let's use it to learn a way to add and subtract larger numbers.

T: 23 children are swimming in a pool. 8 children join them. How many children are swimming now? (Write 23 children, 8 join.)

T: Talk with your partner: Do we know the whole and 1 part, or both parts. Get ready. (Signal)

S: Both parts.

T: Yes. And part + part = whole, so what is the operation, addition or subtraction? (Signal)

S: Addition!

T: Yes. Watch. First I'm going to write the number vertically, standing up, and then I'm going to draw a place value chart and use number disks to make a model of the number.

III COMMON CORE

T: I want you to follow along and do what I do. (Pause after you write the problem, then again after you draw the place value chart.)

T: How many tens are in 23? Remember to name the unit. (Signal)

S: 2 tens.

T: Place 2 ten-disks in the tens place, like this. (Show them.)

T: How many ones in the ones place? (Signal)

S: 3 ones.

T: Place the 3 ones. (Model this.)

T: Now add 8 ones to 3 ones. Be sure to show them in arrays of 5, like on a 10-frame. (Model this.)

T: 3 ones plus 8 ones is…? (Signal)

S: 11 ones!

T: Talk with your partner: Looking at your model, what do you notice? (Pause, then call on a volunteer.)

S: "We made a ten."

T: Yes, we did. And 10 ones is the same as…? (Signal)

S: 1 ten!

T: So exchange 10 ones for 1 ten, like this. (Remove 10 ones and place a ten in the tens place.)

T: We have to show what we did in the problem.

T: 11 ones is 1 one and a new unit of 10. We write the 1 below the line in the ones place, and we show the new unit of ten above the digit in the tens place. Everyone write that. (Pause.)

T: 1 ten plus 2 tens is…? (Signal)

S: 3 tens!

T: 23 plus 8 is…? (Signal)

S: 31.

T: How many children are swimming in the pool? (Signal)

S: 31 children are swimming in the pool.

T: Talk with your partner: Why is it important to know when you make a unit of ten? (After a moment, choose a volunteer.)

S: "When you make a unit of 10 you have to rename it as 1 unit of the next larger unit."

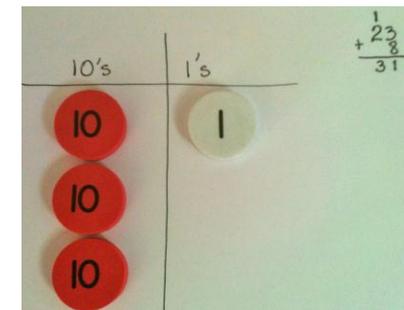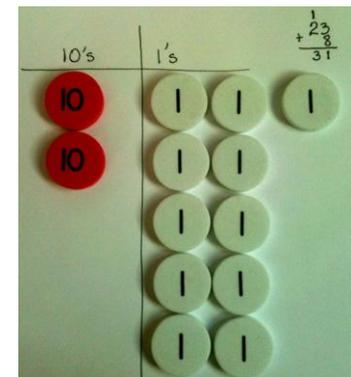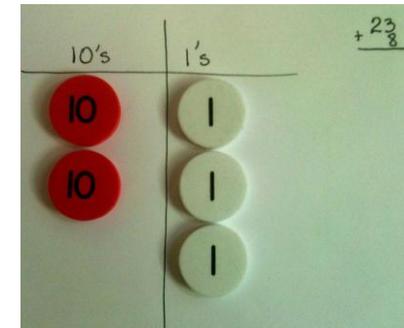T: So when you saw 8 ones plus 3 ones, did you know right away that you would have to rename?

S: Yes.

T: How did you know?

S: I know 8 and 2 is 10, and 3 is 1 more than 2, so I knew I'd have to rename.

T: Wonderful reasoning! Thank you.

T: Now let's see how we use a place value chart and number disks to model subtraction.

III COMMON CORE

T: This time, instead of using the actual number disks, we're going to draw them.

T: Open up your Learning Logs and draw a place value chart for tens and ones. Like this. (Model.)

T: There are 33 marbles in the bag. 15 are blue. The rest are green. How many marbles are green? (Write 33 marbles, 15 blue.)

T: Beside your chart write 33 – 15 vertically. Be sure to line the digits up in the correct place. (Model)

T: How many tens in 33? (Signal)

S: 3 tens.

T: Draw 3 circles in the tens place. (Model)

T: How many ones in 33? (Signal)

S: 3 ones.

T: Draw 3 circles in the ones place. (Model)

T: Look at the ones. Do you have enough to subtract 5 ones? (Signal)

S: No!

T: Talk with your partner: Where can we get some ones? (Pause, then choose a volunteer.)

S: "You can open up a ten."

T: Can you explain what you mean?

S: "1 ten is the same as 10 ones, so we can take away a ten and show 10 ones instead."

T: Right! Remember? (Unclasp your hands and wiggle your fingers.)

T: I really love the way you explained your thinking with such precise language!

T: Watch how I cross off 1 ten. The ten doesn't fly away or disappear. I exchanged it for 10 ones. So I draw 10 ones in the ones place. That's why I drew the arrow, to show where that ten went. Be sure to draw the 10 ones in 10-frame form. (Model these steps.)

T: Now we have to show what we did on the problem. I don't have 3 tens anymore, do I? How many tens are there? (Signal)

S: 2 tens.

T: So cross off 3 tens and write 2 above it. (Model)

T: And I don't have 3 ones anymore? How many ones do I have? (Signal)

S: 13 ones!

T: So cross off 3 ones and write 13 above it. (Model)

T: Now we can take 5 ones from the ten. Cross off 5 ones. (Model this.) How many ones are left? (Signal)

S: 8 ones.

T: Write 8 below the line in the ones place. (Model)

T: We still have to subtract 1 ten from 2 tens, so cross off 1 ten. (Model)


IIM COMMON CORE
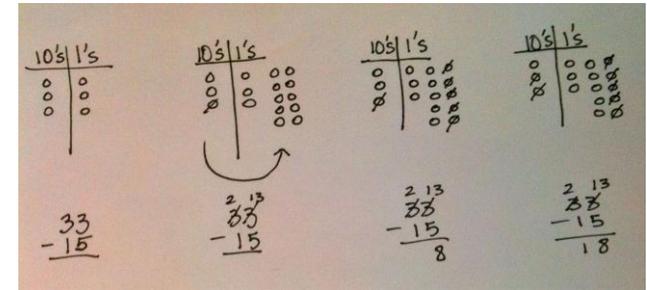
T: And show this change on the problem. 2 tens minus 1 ten equals 1 ten. Write 1 below the line in the tens place.
T: So how many marbles are green? (Signal)
S: 18 marbles are green.
T: Correct!

"You do (10 minutes)
T: (Pass out the Activity Sheet.)
T: Now you're going to have a chance to practice drawing a place value chart and number disks to solve some problems.
T: You have 10 minutes to complete the Activity Sheet. (After 10 minutes)
T: Everyone stand up. Raise your hands over your head and stretch yourself as tall as you can, standing all the way up on your tippy toes.
T: Now it's time to come to the carpet. But…you have to get here in 10 steps! No more, no less. Figure out how you're going to do it and get here for our debrief. Go!

> *To the teacher:* Again, such a leap would never occur in an actual classroom lesson. This is meant to show where crossing the ten leads in 2nd grade.
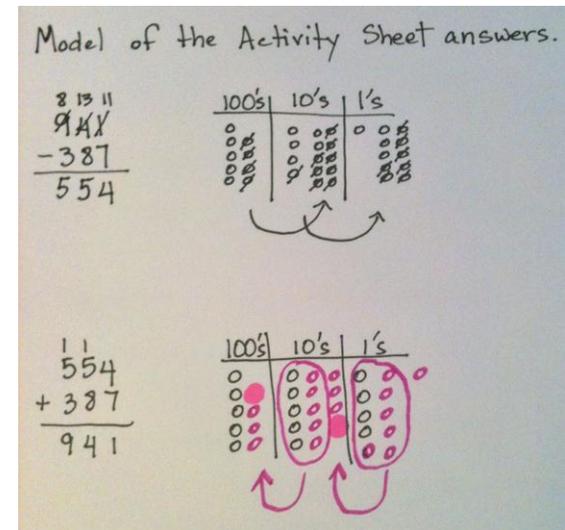
"Debrief" (8 minutes)

T: (Chart a list of equations similar to the one at right.)

T: Look at these equations. Talk with your partner: Here are some questions you might try to answer: What patterns do you see? How do these problems relate to each other? How are they the same and different? How do they relate to what we learned today? How do the first problems help you understand the later problems? Those are some of the questions that I have. What questions do you have? (About 2 minutes, then choose a volunteer to begin the discussion.)

S: "Making ten works with bigger numbers." "The unit is different, oranges, tens, grams, but the math is the same. If I know 8 + 6 is 14, then I know 80 + 60 is 140."

T: That's a very important point. What is the pattern?

S: "You always look to see if there's a ten."

T: And how does ten help you when you're subtracting?

S: "If you don't have enough ones you can get them from a ten.

T: Thumbs up if you learned something today that makes math easier? Who would like to share?

S: The number disks helped me know when to rename.

T: Thank you for sharing your thoughts and ideas. Please return to your seats.

T: You have 2 minutes to finish your Exit Ticket.

Students sit on the rug in a large circle so they're facing each other for discussion.

$$9 + 6 = 15$$
$$\wedge$$
$$1 \quad 5$$

$$9 + 1 = 10$$
$$10 + 5 = 15$$

$$8 \text{ oranges} + 6 \text{ oranges} = 14 \text{ oranges}$$
$$/ \setminus$$
$$2 \quad 4$$

$$8 \text{ tens} + 6 \text{ tens} = 14 \text{ tens}$$
$$/ \setminus$$
$$2 \text{ tens} \quad 4 \text{ tens}$$

$$80 + 40 = 120$$
$$/ \setminus$$
$$20 \quad 20$$

$$700 \text{ g} + 500 \text{ g} = 1 \text{ kg } 200 \text{ g}$$
$$/ \setminus$$
$$300 \quad 200$$

III COMMON CORE