Addition and Subtraction Grade 2
Transcript

Teacher 1: I know that we have been working on adding and subtracting numbers based on place value and mental strategies for several weeks now. I wanted to touch base and see how it is going with your students.

Teacher 2: Great. Thanks for checking in. Can we look at some student work and talk through some questions I have?

Teacher 1: Sure, why don't we start with the problem we gave our students earlier this week?

Teacher 2: That was the two-step word problem that required both addition and subtraction.

Ms. Rhodes has two boxes of stickers. She has 174 stickers in one box.

She has inset 268 stickers in the other box. She gives 76 stickers to another teacher. How many stickers remain in the two boxes?

Teacher 1: Let me share the work of one of my students who used a number line to solve the problem.

Teacher 2: Wow! I'm impressed. Were you able to watch the student while solving this problem?

Teacher 1: Yes. I was also able to ask some clarifying questions during the process.

She knew that she needed to add 174 and 268, because that was the larger addend. To add 174, she decomposed 174 into 100 and 74, and then she recorded a jump of 100, landing on 368. She pointed out that 368 is two away from 370, so she recorded a jump of two. She realized she still needed to add 72. She saw that 370 is 30 away from 400, so she recorded a jump of 30.

She then said, "42 more to go". I know this because 72 is 30 and 42 together. The three and the four make the seven in the tens.

She recorded a jump of 40 to land on 440. Finally, she made a final jump of two to land on 442.

For the second step of the problem, she knew she needed to subtract 76 from the total number. By looking at the number line, she recognized that her last four jumps totaled 74. She traced the +2, + 30, + 40, and +2, adding them mentally as she went. So, she said, "2, 32, 72, and 74."

So, she took a backwards jump of 74, landing back at 368. She said, "Two more to go!" and drew a final backwards jump of 2 to arrive at 366 on her open number line.

Teacher 2: That's a great example of using mental strategies, place value, and properties of operations. I know she wasn't thinking with those terms, but she certainly applied those skills.

It's interesting that the student's first step to solve this problem was to start with the larger addend and decompose the smaller addend in order to add 100. Then, she focused on number relationships to work with multiples of 10. She probably said something like "ends

in zero." Then, she connected what she was subtracting to what she had just added to help her complete the second step of the problem.

I can see her reasoning. What do you think the next steps in learning are for this student?

Teacher 1: Well, I'll begin by encouraging this student to try combining the place values to make jumps. For example, I think this student could comfortably make a jump of 42 instead of having to decompose the number into a jump of 40 and a jump of two. From what I see of her understanding of decomposing numbers on an open number line, I'd help her transition to a place value algorithm.

Teacher 2: I think I have an example of the place value algorithm that you are talking about. Let's look at this student's work.

Teacher 1: Yes, this is that place value algorithm. It's interesting that the student used both the place value strategy and the open number line to solve the problem. Why do you think the student used two methods?

Teacher 2: I was able to go back and discuss this problem with him afterwards. He decomposed each number separately into its expanded form. Then, he proceeded to add each place value, adding the hundreds to get 300, the tens to get 130, and the ones to get 12. Here, he was able to mentally add the value of the tens and the value of the ones to make a sum of 142.

Teacher 1: He appears to have recalled the sum of 4 and 8 instead of using a fact strategy, such as make a 10.

Teacher 2: Exactly. This student's automaticity with addition facts is growing. If he had gotten stuck, I think he would have remembered how to make 10 and still would have ended up with a total of 442. The subtraction is what interested me.

For the second part of the problem, the student made an open number line to determine the answer. When I asked him about it, he explained that he realized that he would have to regroup to subtract.

Right now, he prefers to solve subtraction problems with an open number line instead of a place value algorithm. I also find it interesting that the number line was created differently from your student's line. He started by decomposing the six ones and then decomposed the value of the tens, the 70.

Since we are discussing the place value strategy, can you help me think through this student's work? I haven't had a chance to ask her about it, and I wanted to reflect a little before doing so.

Teacher 1: Hmm. This is interesting, it looks like she decided to subtract all 76 stickers from the one box of 174. Let's rewrite the problem to match subtracting 76 stickers from the box of 174 and then combine that difference with the other 268 stickers.

First, we need to figure out how the student got 100 on her second line of the work. Let me see if this works, the student could have mentally decomposed 76 into 74 and two, which would look something like this. Then, we could rewrite our expression as 174-74-2+268. The student must have mentally found the difference of 174 and 74 which is 100.

Teacher 2: I agree. So, to show the difference of 174 and 74 as 100, I would write it like this.

Teacher 1: Yes, and then write the rest of the expression -2+268.

Teacher 2: This matches the student's work.

Teacher 1: Good. It seems like we are aligned to what this student was thinking. Next, we have to determine how the student got 368. It looks like the student added 100 and 268 to get 368. If we wrote the rest of the expression -2, would that match the students work?

Teacher 2: Yes!

Teacher 1: Then, the student subtracted two from 368 to get 366.

Teacher 2: I see it now. In this case, the student understands that 76 can be subtracted from either addend instead of adding first and then subtracting like the other two students. I'd like to share some of these examples with my students to help them make connections with open number lines and place value algorithms in order to add or subtract more fluently. This will help lay the foundation for the standard algorithm!

Teacher 1: Let's look through the rest of our work samples and see if there are any others that we should share.

Teacher 2: Sounds great!