Dialogue Box

A Subtraction Story Problem

During Session 4.3, students are discussing their strategies for solving the following story problem:

Kira had 16 baseball cards. She gave 7 of them away. How many baseball cards did Kira have left?

Teacher: Who wants to start us off?

Yama: I took 16 cubes.

Teacher: [She makes a tower of 16 cubes and double checks her count.] Now what should I do?

Yama: Take away 7.

The teacher snaps off 7 cubes. There are now 2 towers, one with 9 and one with 7.

Teacher: Where's my answer? [Henry points to tower of nine.] How do you know?

Henry: Because she gave away 7, and that's that tower. So that's how many she has left.

Teacher: How could we show this strategy on paper? [The teacher draws a cube tower of 16 on the chart paper.] What should I do next?

Carla: Show the part that you took away. Make an X on the first 7. Then next to the leftover cubes write the numbers.

The teacher does this, and then labels the two parts "the cards Kira still has" and "the cards Kira gave away."

Teacher: Did anyone have another way?

Simon: I counted back 7 from 16.

Teacher: Can you show us what *you did*?

Simon: I went 15, 14, 13, 12, 11, 10, 9.
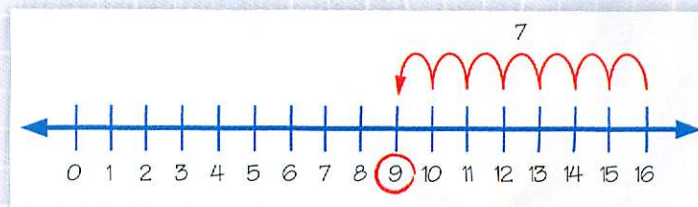
Teacher: What are you doing with your fingers?

Simon: Keeping track.

Teacher: What do you mean?

Simon: Every time I say a number I put up a finger.

The teacher asks Simon to demonstrate again. As he does, she keeps track on the number line.


Then, Leigh comments that she did something similar.

Leigh: I took 7; in my mind I had 7. On my fingers I counted to 16. I was counting by 1s. I counted on from 7 to 16 and kept track of how many there were. I got 9. [She demonstrates.] I thought it might be harder if you did 16 backwards, like Simon did.

Teacher: Why did you stop with 16?

Leigh: That's the number in the problem.

Teacher: So you did something with counting up. We could show that on the number line, too.
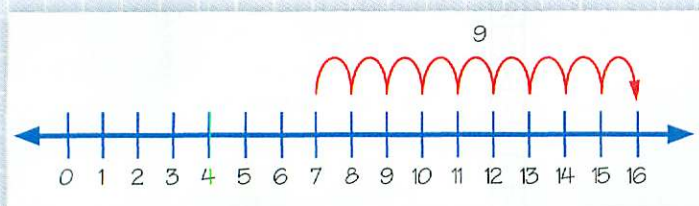
Teacher: I think Monisha thought about adding too. Monisha will you share your strategy?

Monisha: Well, I know that 8 + 8 = 16, I know that if you take 1 away from one of the 8s and give it to the other 8, I knew I'd have 7 + 9 = 16.

Teacher: Monisha, did you think in your head seven plus what equals 16? [Monisha says, "Yup."] Monisha was thinking "7 plus what equals 16." Then she thought, "I know something that equals 16: 8 + 8!" She thought, "If I take 1 from this 8, and give it to the other 8, I'll have 7 + 9." She used what she knew about 8 + 8 to fill in the blank.

The teacher asks a student to demonstrate the connection between 8 + 8 and 7 + 9 with cubes. Then they move on to another strategy.

Juan: If I have 16 and I minus 7; I thought 10 and 6 makes 16, so, 16 minus 10 would be 6. But it's minus 7, so you have to minus 1 more minus the 10, and that's 9.

Teacher: So it sounds like Juan used something he knew, just like Monisha. Juan knew that 10 + 6 = 16. Then he said something interesting. He said if 10 + 6 = 16 then 16 − 6 = 10.

The teacher uses 10 red and 6 blue cubes to model 10 + 6 making 16, and 16 − 10 making 6.

Teacher: Then Juan thought, "If 16 − 6 = 10, then 16 − 7 . . . ?"

Juan: 9. It's minus 1 more.

Chen: Mine's kinda like Juan's, but I didn't really think about it like what he just said. I did, first I took away 6, then I took away 1.

Teacher: Why did you take away 6?

Chen: Because I know 16 − 6 is 10.

The teacher models this on the number line and records the equations on the board.