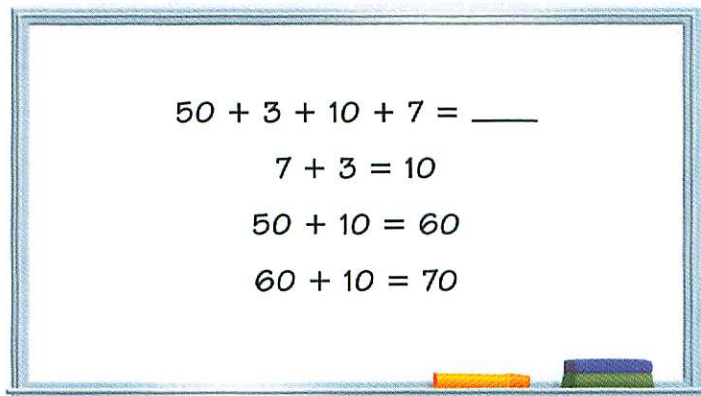


Adding 2-Digit Numbers

Over the course of Investigations 1 and 2, students have been solving story problems based on stickers. Many of the students in this class have been adding by 10s and 1s to solve these problems. In this discussion, students discuss a problem that requires regrouping ten 1s into another ten.

Teacher: The problem was, “For a present, Sally got 5 strips of ten stickers and 3 single stickers from her mom and 1 strip of ten stickers and 7 single stickers from her dad. How many stickers does Sally have in all?” Who has an equation that represents the problem?

Jeffrey: $50 + 3 + 10 + 7$. But I started with 7 plus 3 equals 10. And then 50 plus 10 equals 60 and then 60 plus 10 equals 70.



Teacher: Where did Jeffrey get his numbers [pointing at the original equation]?

Roshaun: He got the three from five strips and three singles, the seven from the one strip and seven singles; he got the five from the . . .

Teacher: The five? I don't see a five.

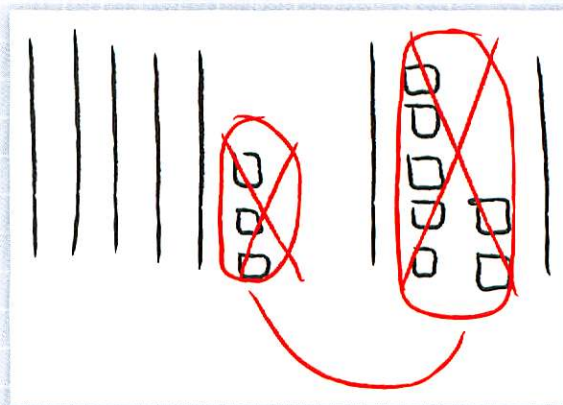
Roshaun: No, I mean the 50. He got that from the *five* strips and three singles. And the 10 is from the *one* strip and three singles.

Teacher: Did anyone have a different equation?

Katrina: I had $53 + 17$. But I did it like Jeffrey. I did $3 + 7 = 10$ and $50 + 10 = 60$ and $60 + 10 = 70$.

Teacher: Leo, could you share how you used strips and singles to solve $53 + 17$?

Leo draws 5 strips of ten and 3 singles and then 1 strip of ten and 7 singles. He circles all of the singles, crosses them out and makes a 7th strip of ten.



Teacher: What would Leo's strategy look like with cubes?

Henry: [Counts out towers, each with ten blue cubes] 10, 20, 30, 40, 50. 1, 2, 3. [He breaks three off another tower of ten.] That's 53. Then we need another ten, and a tower of seven. [He assembles 17 red cubes.] That's 17.

Teacher: Then what did Leo do? What did he combine first?

Rochelle: The 10s. 50 plus 10. [She moves the towers of ten together.] Then he did $7 + 3$ [she snaps together the tower of three and the tower of seven], and that made another ten, for 70 in all.

Note: When Rochelle added the seven to the three, I noticed that there were all tens.

Teacher: How come when I combine the tower of seven and tower of three there are no 1s? 53 has three 1s and 17 has seven 1s but 70 has zero 1s. Why is that?

Rochelle: When you add the seven and the three, you get a ten.

Leigh: Seven 1s and three 1s make a ten. Ten doesn't have any 1s anymore.

Teacher: Jeffrey, Katrina, and Leo all added the 10s, added the 1s, and then combined those totals. Did anyone solve it a different way?

Luis: I did it like that, but I broke up only the one strip and seven singles. So I did 53 plus ten equals 63 and then 63 plus seven equals 70.

Teacher: What was Luis's strategy? [Luis lays 53 blue cubes out next to 17 red cubes.]

Chen: He added the ten to the 53 and got 63. [He takes the ten red cubes and puts them next to the five towers of ten blue cubes. The teacher records $53 + 10 = 63$ on chart paper.]

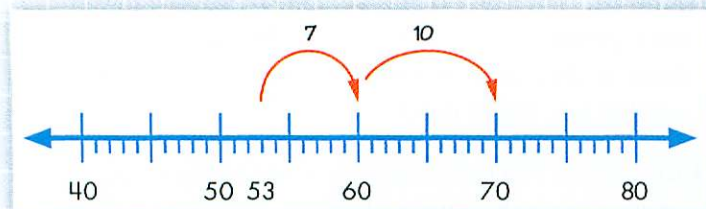
Teacher: And then what?

Carolina: Then he did the tower with 7. He added 7 to 63 and got 70. [The teacher records $63 + 7 = 70$. He snaps the tower of 7 red cubes onto the tower of 3 blue cubes.]

Teacher: How could we show Luis's strategy on the number line?

Melissa: You could count up 17 from 53. But Luis went up 7 and then he jumped 10.

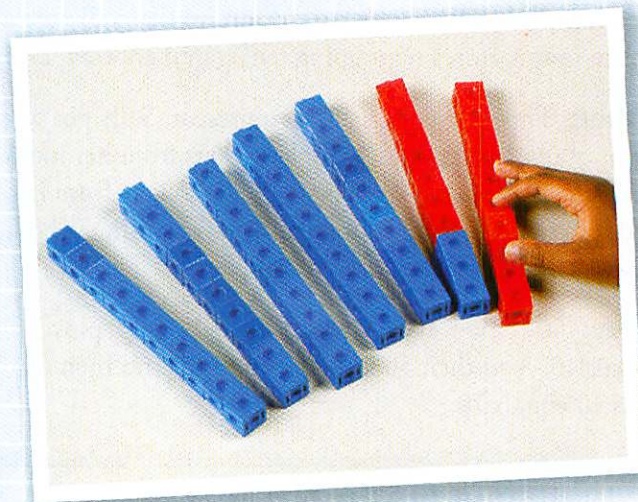
Melissa demonstrates on the number line. Starting on 53, she makes one jump of 7 to 60 and then a jump of 10 to 70.



Teacher: Suppose that I wanted to do it a different way. [She reassembles the cubes to match the original problem.] What would happen if I took Luis's idea but I added the seven first—where would I be?

Rochelle: 60. [The teacher records $53 + 7 = 60$. Rochelle snaps the tower of seven red cubes onto the tower of three blue cubes.]

Teacher: Then what do we have left to add? (10) Then where are we? (70)



Red and blue connecting cubes are used to model Luis's strategy for finding that $53 + 17 = 70$.

Teacher: What would that strategy look like on the number line? I added ten first. If I'm on 53 and we do a chunk of ten first, where do we land?

Monisha: 63.

Teacher: And then what?

Monisha: And then a chunk of seven to get to 70.

Monisha goes to the number line and counts up seven by 1s from 63 to 70.

Teacher: Now let's think about solving this problem on the 100 chart.

This discussion provided an opportunity to further investigate the strategy of adding by 10s and 1s and to consider what happens to the 1s and 10s when adding 2-digit numbers. The use of multiple tools to model this problem helped students visualize the problem and share their strategies.