

## Discussing Addition Strategies

In Session 2.1, students are sharing their strategies for the problem  $427 + 733$ . In this class, students come to the board and write their strategies as they explain them.

**Lucy:** I broke it up into 700 plus 400, and then I had 30 plus 20 that I broke off those numbers and it equaled 50. Then I did 7 plus 3, which equals 10. Then I did 1,100 plus 50 plus 10, which equals 1,160.

$$\begin{aligned}30 + 20 &= 50 \\700 + 400 &= 1,100 \\7 + 3 &= 10 \\1,100 + 50 + 10 &= 1,160\end{aligned}$$

In Lucy's strategy, she has broken the numbers apart by place value, combined each place, and then added the sums back together.

**Teacher:** Who has a different strategy for the same problem?

Ramona comes up to the board.

**Ramona:** Take the 3 from 733 and then do 427 plus 3 equals 430. Then do 430 plus 30 equals 460 and then 460 plus 700 equals 1,160.

$$\begin{aligned}427 + 3 &= 430 \\430 + 30 &= 460 \\460 + 700 &= 1,160\end{aligned}$$

Ramona's strategy begins by breaking up one number and adding it on in parts ( $733 = 3 + 30 + 700$ ).

**Teacher:** Let's look at Ramona's strategy. How did she start?

**Terrell:** First, she broke off the 3 from the 733. I thought she was going to first start with the 100s. I was surprised that she started with the 1s.

**Teacher:** What did you see her do next?

**Terrell:** Then she did 427 plus 3.

**Teacher:** Why do you think she did that? What was her goal?

**Terrell:** To get to the nearest 10 and then maybe it would be easier for her to add.

**Teacher:** So she's using landmark numbers, or 10s. She's working with numbers that are comfortable for her.

The class ends its discussion at this point and returns to it the next day. This time they are discussing  $196 + 625$ .

**Nadeem:** I did it as 200 plus 625. That's 825. And 825 take away 4 equals 821.

The teacher decides to question the whole class about Nadeem's strategy.

**Teacher:** Where did Nadeem get 200 plus 625?

**Ursula:** He added 4 to the 196 to get 200.

**Amelia:** And if he added 4 on, he had to minus it at the end.

**Steve:** You can add a 4 and then subtract it. You borrow the 4 and put it back.

Nadeem's strategy shows that when one of the numbers is changed to make the problem easier to solve, an adjustment must be made so that the sum stays the same.

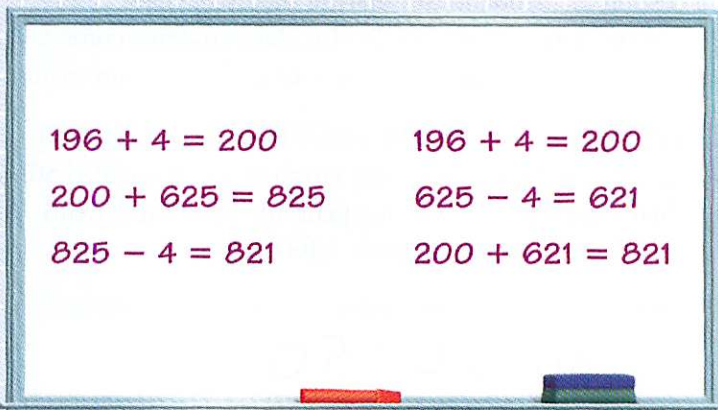
**Anna:** I did it kind of the same way, but a little different. I did 196 plus 4 is 200. Then 200 plus 621 is 821.

**Teacher:** That does seem different to me. Could someone explain how Anna got 200 plus 621?

**Marisol:** She moved the 4 from the 625. If she took the 4 from the 625, she'd have 200 plus 621.

What Anna has done with her strategy is to create an equivalent problem, which Marisol is able to visualize. However, other students are looking puzzled. The teacher

decides to show these two variations of the strategy of changing one or more numbers and adjusting for the change side by side. She writes the following on the board:



**Teacher:** If you saw this as a solution, and this as a solution, do they both make sense?

**Luke:** I think I get it. You can either minus the 4 at the end or do it first, and then add. The answers both come out to 821.

Later in the Investigation, students will revisit this idea of making an equivalent problem and have an opportunity to explore it further by thinking of ways to represent it with story contexts, diagrams, or number lines. For now, over these two days of work and discussion, they have collected a good repertoire of strategies for addition, which they will name and continue to refer back to as they solve more problems in this Investigation.