

Order and Subtraction

In Session 2.2, as students generate expressions for *Today's Number: 7*, they first consider pairs of expressions such as $2 + 5$ and $5 + 2$ (which they have labeled turnarounds), and then investigate whether order matters for subtraction. They begin by looking at $9 - 2$ and $2 - 9$. After exploring the question in pairs, the class comes back together to share their thoughts.

Teacher: What do you think? What did you find out? Does order matter when you subtract?

Darren: Turnarounds work for subtraction if the answer is zero. $100 - 100 = 0$. You turn the numbers around, and you get $100 - 100 = 0$.

Luis: But if the answer isn't zero, it doesn't work. $9 - 4$ doesn't equal $4 - 9$.

Teacher: How did you think about 4 minus 9?

Luis: If you have 9 fingers and you take 4 away, you have 5. If you have 4 fingers and you try to take away 9 fingers, you have none left. So 4 minus 9 is zero.

Teacher: Did anyone think about 4 minus 9 in another way?

Katrina: You can't do 4 take away 9 because after you lose the 4 . . . if you have 4 take away 9 . . . 4 doesn't have 9. 4 is not a 9.

Teacher: Are you saying that 4 isn't enough? That there isn't enough to take away 9? How many could I take away?

Katrina: You could only take away 4 to make zero.

Tia: You can't lose the 4 because after you lose the 4 . . . 3, 2, 1, 0, 0, 0, 0 . . . It's gonna keep on repeating itself when it gets to 9.

Roshaun: I think it wouldn't be zero. It would be negative 5.

Teacher: What do mean by negative 5?

Roshaun: It means you're going lower than zero. Negative 1, negative 2, negative 3, like that.

Nadia: 9 minus 4 equals 5 and 4 minus 9 equals negative 5. If you use the number line . . .

Nadia demonstrates on the class number line how she and her partner counted back nine jumps from 4 and landed on negative 5. Some students are nodding in agreement, but others seem puzzled by this new idea. The teacher decides to revisit the idea of order in subtraction at a later time, using this discussion as just an initial introduction.

As students begin to consider whether order matters in subtraction, they also begin to think about numbers less than zero. Although not all second graders are ready or have an interest in thinking about negative numbers, some are able to use a number line, for example, to model numbers less than zero. Negative numbers or ideas such as "owing" often come up in this discussion, but the focus should stay on whether order matters when subtracting two numbers. Note that the teacher in this class does not resolve what the answer to $4 - 9$ is. Her intention was to introduce the idea of order in subtraction, and she plans to revisit this in subsequent discussions.