Does the Order Matter?

After all of her students have had a chance to visit the Counting Jar, which had three red checkers and five black checkers in it, the teacher calls them together to discuss their findings in Session 1.6. She begins by highlighting a particular counting strategy—Emma's organization of the checkers—as a springboard for discussing whether order matters when counting. This is the seed of an idea that students will return to in Grades 1 and 2 when they are working on addition. This same idea will later be formulated as the commutative property of addition.

Teacher: When I was watching you at the Counting Jar, I noticed Emma doing something interesting. Emma, would you show us how you organized the checkers to count them? (Emma places the three red checkers in a row above the five black checkers.) Emma, why did you put the checkers in two lines like that?

Emma: It makes it easier for me to count them.

The teacher explains that sometimes, when counting a group of objects, it is hard to remember which ones have already been counted and which ones still need to be counted, and that Emma's strategy might help students keep track. Then, she asks a different volunteer to count the checkers. Jason does and gets a total of eight checkers.

Teacher: I noticed that when Jason counted, he counted the red ones first and the black ones second. I'm wondering what will happen if we count the black ones first and the red ones second? (The teacher rearranges the checkers so that the row of reds is below the row of blacks. Some children say "nothing," and others say, "the same thing.") The same thing? Carmen why do you think we're going to end up with the same thing if we count them in a different order?

Carmen: Because you'll still have all the other ones unless you just take one away.

Jennifer: If you take one away, it would change it, but if you didn't, it would be the same.

Teacher: Okay, we're still going to have all the other ones unless we take one away. Are we going to take one away? (Carmen responds "No.") No, what are we doing that's different?

Carmen: You're doing them in a different order.

Teacher: We're doing it in a different order. I have a really important question for you. Do you think it *matters* if we change the order? (Some students say "yes," and others say "no.") What will happen if we count the black checkers first?

Rebecca: Nothing.

Teacher: Rebecca says nothing. Nothing's going to happen, it's not going to change it. Rebecca, how come nothing will happen?

Rebecca: 'Cause it's still eight.

Teacher: Okay, it's still eight checkers there.

Mitchell: I think you still end up with eight but instead of counting the three first, you count the five first.

Jae: I also think you will get eight.

Teacher: Why?

Jae: I don't know.

Teacher: Should we test it and see?

The class says yes. Mia volunteers to count. She touches each checker as she counts, starting with the black and then counting the red checkers. She gets eight.

Teacher: What happened?

Hugo: Same number. It's always going to be the same number.

Teacher: You think it's *always* going to be the same number?

Lionel: It doesn't matter what order it is. It all depends on what number it is. It's still going to be eight, 'cause it's the same number.

Teacher: Is this getting the same answer no matter which order you counted something special about the checkers, or would it work with anything?

Sarah: If you take the same number, it would be the same. (She sets out three yellow and five blue teddy bear counters. She counts the yellows first, then the blues, and gets eight.)

Teacher: What if you count the blues first?

Abby: Still eight! You can even do this (arranges the teddy bears in a line: yellow, blue, yellow, blue, yellow, blue, blue, blue and counts them) and it's still eight.

Manuel: It doesn't matter how you do the colors, it matters how many there are.

When asked whether order matters when counting, some students said yes and others said no. However, the students who participate in this discussion seem certain that when counting a set of objects, the order does not matter. This teacher knows that some of her students, such as Jae, cannot yet explain *why* the order does not matter, and others are not yet sure that it does not. In fact, she is fairly certain that a few students may still believe that eight checkers stretched out in a long line is *more* than eight checkers pushed together in a short line. Because the teacher knows that this range exists in her classroom, she will revisit this idea in various contexts throughout the year to help students develop and deepen their thinking and their ability to explain the concept.