Helping Students Build on Each Other's Ideas

Meghan Mallon has spent a considerable amount of time this year teaching her Kindergarten students how to explain their thinking and how to listen to each other's ideas. In this case, we see how creating such a community of learners can enhance the mathematical environment and make even everyday classroom routines more thoughtful and challenging.

My students each have a counting collection. The collection, which consists of small objects found in the classroom, is kept in a resealable plastic bag. The number in the collection is supposed to match the number of objects in the counting jar that week.

For their morning job one day, I asked my students to count each other's collections. There were 21 candy hearts in the jar, so most of the bags contained 21 items. Not long into the activity, Simone came up to me and showed me a page she

had made. She explained that she had sorted Sam's tiles by color. She counted each color and then added them up. Her page showed 9 blue color tiles, 4 reds, 3 greens, and 5 yellows. By each line of color tiles she had written the number in that group. Across the top of the paper she had written 9 + 4 + 3 + 5 = 21. On this particular day we did not have much time to actually discuss the morning job, so I let Simone quickly show her paper, and we then moved on to our next activity.

Later that day, during math, I taught the students how to play *Double Compare.* In *Double Compare* each player lays out two number cards for each round, and the winner is the player whose cards total the highest number. We played a few rounds of the game as a class so the students could get a sense of how the game is played. I did not yet want to discuss strategies for adding or for figuring out who has the highest total. As I was gathering up the cards and getting ready to send the students off to play, Laurie threw out the comment, "Well, if one person gets 3 and 5 and the other person gets 5 and 3, it's still the same." The class had been sitting for a while and was getting restless so, as with Simone's idea, we didn't have time to discuss what Laurie had shared. I told Laurie to keep her eye out for that situation as she played.

After school that day, I had time to think more about Simone's idea. I decided to make a poster of her paper to show the students the next day.

The next morning I gathered the students on the rug and had Simone explain her paper one more time. We then counted the pictures of color tiles on her paper and on the poster and found that the total was 21, just like the 21 hearts in the counting jar. Next, we added up the numbers in Simone's number sentence 9 + 4 + 3 + 5 by counting on from 9 using our fingers and once again got 21 as the answer. I then showed the class a new collection of 4 red chips and 5 blue chips and said, "So, if Simone's way of showing Sam's

collection makes sense to you, you might want to try to use her idea to help you count the chips and show how many there are in this collection."

Only two students can go to the counting jar at a time. Since I wanted more students to have a chance to think about this idea, I quickly made up trays with objects for the students to count. I put between 6 and 10 objects on each tray, and each collection had items with two different colors. As I did this, I narrated for the class what I was doing and thinking:

I'll put yellow and black cubes on this tray, and green and red bears on this tray. There—now lots of kids can think about counting the two colors separately and adding them up.

Before setting the students off to work with their collection, I asked Laurie to explain her idea about *Double Compare* to the class again. She used the same numbers, 5 and 3, in her explanation.

Teacher: So do you think this is something special about 5 and 3, or do you think this works with any two numbers?

Laurie: Any two numbers.

Teacher: So if I got 6 and 3 and my partner got 3 and 6, we'd have the same score?

Laurie: Yes.

I told the class that if what Laurie said made sense to them, they should be on the lookout for times when they had the same numbers as their partners but in a different order and should see if they ended up with the same score. And off they went.

I observed my students closely as they worked. Many of them counted the objects they were working with by sorting them by color, counting the items in each group, and then combining the groups. I observed some students using known addition facts to combine their groups. I also saw students counting onto one group to find the total, and several students counting all of the objects in both groups to find the total. Their papers varied in how organized and clear they were. Some students included number sentences and others didn't, but everyone showed the two different subsets on their paper.

After the work time was over, we sat in the meeting area and looked at some of the papers. On most of the papers, students could see where each subset was and how many were in it and could see the total. When we got to Kirby's paper, I commented on the row of 9 squares across the top, 5 blue and 4 red. Kirby had also written the number 9 and his name in boxes underneath the top row. There was also a good deal of other marking on his paper, which didn't surprise me, as Kirby likes to draw paths through letters and words, color over things to show action, and write codes and abbreviations. I was about to move on when Kirby said, "But I did Laurie's thing, too." I looked, and one of his rows of boxes also had 9 colored in—4 reds first and then 5 blues. I asked Kirby to explain, and he said, "Like Laurie said, you can do it in either order, and it's the same." I was very impressed with the connection Kirby made between the two ideas with which we started our math class.

We've had many conversations about showing our ideas and answers on paper; Simone spontaneously and independently applied this to a situation where it wasn't required of her to communicate a new idea about the counting jar. Students had shown the color of the items in the jar before, but there had not been any conversation about counting up subsets and adding them to find the total. Simone knew from experience that ideas like this should be shared with the class. Laurie expressed her idea about combining numbers in Double

Compare spontaneously and comfortably. The class as a whole listened to these ideas and continued to make sense of them as they did their math work. And Kirby connected the two ideas.

When two students make interesting mathematical observations, Ms. Mallon goes beyond just having the students share their thinking with the class; she encourages the class to experiment with the ideas themselves and provides a situation in which they can do so.

Questions for Discussion

1. In what way does Ms. Mallon show her students that their ideas have value? How does she give students who are ready to think about the challenging math ideas raised by Simone and Laurie a chance to explore them without overwhelming the students who may not be ready to grapple with these ideas?

2. Can you think of a time in your own classroom when you were faced with a similar situation? What decision did you make about bringing the ideas of your students to the class as a whole? What was the outcome of your decision?