TEACHER: We are here at Willard School and we're doing a lesson call "The Math Things Mingle."

JACOB DISSTON: You know I thought it was a pretty unusual type of lesson; I thought it was unusual that there were all these people here. It included a lot of elements that were unusual. They got into this random grouping, which they've done before, but that was unusual. The huddle at the beginning was slightly unusual to have all the kids up at the board the same time. So there were all these unusual moments thrown into one lesson...

...It was very long, it was sort of very, you know, we pushed through... it didn't have a lot of -- except for the beginning once they got in their groups, they were in their groups. So I think there were issues that came up as sort of a lesson, but as a research lesson I thought it was really interesting in terms of what it surfaced about how kids were thinking.

I think we got to a lot of the sort of questions about variables and equations, and a lot of kids were saying "those are equations because you can solve them, those equations because you can solve them." That whole idea like, that they were bringing up the language and their understanding... their understanding of it, I think, was coming through how they were talking about it. And I don't know how much of that, kind of, I steered, or how much just came up. I think I was doing a lot of steering...

They were noticing some of the finer level distinctions. They were pulling apart the property equations and they were mixing up equations and expressions. They were doing all this stuff and I didn't know how we were going to get to that first stage that I wanted to get to. Then it kind of came clear, at least to me, and I don't know how much I forced it, or how much they kind of brought that up, so I'd love to hear from people whether it seemed like whether we constructed the ideas out of their ideas, or whether I kind of shaped it and disregarded it; was it built on their ideas or was it not. I can't replay it well enough to figure that out right now. I do think I did a lot of directing when I was going around to the groups, and it seemed like their discussions were good when I was standing there. I'm eager to hear how those discussions were when I wasn't there. The standard kind of start for me was to come and ask them how they were sorting things, and to hear what they had said, and then say "Why that is important, why do you think it would be important for a seventh grader to know that?" And if they were off track, to pick one of them and say "If this were on a test, what would the instructions be?" Alison, you came up with that in our planning meetings as sort of a prompt... that we direct their discussions if they were off track. And I thought it worked really well in terms of getting them to focus on the things that I wanted them to focus on, although, that goes back to how much of this lesson was about teaching them what to focus on, versus just seeing what they did focus on. So in retrospect I don't know if I did too much driving, or if that allowed their discussions to go deeper and we learned more about what they understand as a result of it. I thought for the most part their group discussions were pretty good in terms of keeping people engaged. There were people in each group that kind of took on a leadership role. I think this group had a hard time staying focused, but, in terms of how some of the students do a normal day, they were very engaged, and I think got something out of it, so I'm really proud of everybody in here.

What evidence is in there that students are able to see these symbol strings as more than just collections of letters, numbers, and operations? I think that evolved, I think it really did evolve through the lesson that they started seeing things, and pulling them out, and having discussions about those and the meaning. And I loved the y=2 because that group over there was convinced it was another thing, it didn't fit and they were talking about that, it's different, it's an answer, the whole idea of answer. The misconceptions that come up... I don't know if they were misconceptions, but they've been trained to think of everything on the right side of the equal sign or the right side of the inequality as the answer. That whole idea came up in a lot of groups, that, you know, "I didn't know that equations didn't have numbers on the right side... I learned that equations could have variables on the right side." The language that Zoe was using about an equation being an equal sign and two values, values being not well defined for her...

The second question, "What evidence is there that students are developing an understanding of the attributes and features of the symbol strings which we utilize in 8th grade algebra?" I think we wrote it deliberately kind of vague, like, "how will these things be utilized in eighth grade algebra?" We're still trying to figure that out, and I think a lot of our work here has been to try to figure that out. So, how does what we teach in sixth grade and seventh grade get used in eighth grade? Because the things we have been teaching over the years don't seem to be the things that give kids success in eighth grade algebra. So of these things, to me, it's not that they know when you have 3+2n=8, one of those equations, that you first subtract 3 from both sides and you divide by 2, it's more than that, the things that will be utilized in eighth grade algebra. But I don't know what exactly more. But I do think they started talking about these things in more richer ways than just, "you do this and then you do this." So I think there was evidence that we're moving them to see these things and how they're connected.