

TEACHER: With our second research question about... "What evidence is there that they are developing understandings that are going to help them be algebraically ready?" I think that what I liked about this lesson is that... more than pushing the ones that are important, it just helps see what are their understandings; you know, "What do they understand? What do they not understand? What understandings, what misconceptions, etc., do they have?" And I was struck by a (inaudible) and sort of thought "Where could you go from here?" It almost feels like now we have brought up some. Now as teachers, and as algebra teachers, we can say which are more or less important in terms of understanding algebra. But now we've seen all the things they've brought up. There's probably more we didn't see, but... we've seen a lot of things they've brought up. And then we can say "OK, things like recognizing when do you need to combine like terms and when don't you?" That's a really important concept for algebra. So then I could see, sort of, as some future integration into the daily class and weekly routine... The way I think of it is that, you can have your glasses with your lenses, and you have different lenses... you know I have these glasses that I bike with, and I can put the clear lenses in, I can put the yellow lenses in when it's raining, I can put the dark lenses in when it's sunny out. It's sort of like, OK, today we looked at equation, inequality, expression... but within expression we came up with combining like terms, and not combining like terms. Now I'm going to give you ten things, both equations, inequalities and expressions, and let's put on our "combining like terms" lenses. Let's not look at these three, let's just look at: which of these you can combine like terms? And another day you could look through a different lens: "Which one can you solve for an unknown? Which of these do we use properties at all?" Because even the ones that aren't written like properties, you are using properties to solve a lot of those equations. So, here are all of the things they came up with, and I could see returning to some of them with that sense of "Let's look at it with this lens, now let's look at it with a different lens." I think that, from my limited six months experience teaching algebra, that that is a huge thing of the kids that are successful. And that's what we've talked about when we planned this lesson is, "How do you help students develop these instincts?" So they don't just look at it and say "What do I do?" The huge thing I have now is that they look at it, and they do some work, and they say "Am I done?" Some of them don't know what to do, and some of them don't know even if they are done, because they're not sure what it would look like when they're done. So helping to develop these instincts, I think.... a piece of it is like, having in your head all these different lenses that you could look at things with...

TEACHER: So do you think that the experience the kids had today, you see as a first step in helping to develop those instincts?

TEACHER: Yeah, I could really see that today sort of opened up the fact that there are these different lenses. Like kids in the end saying "I realized there are categories within categories." We chose when we planned it to go to the equation, inequality, expression thing. We felt like, at a minimum, we would like every student to leave here today understanding those three categories. And hopefully they understand that there's even more categories within those, or even combining... I think it's important to see that just because those are expressions, and you could say "Well, some I can combine like terms and some I can't," the same thing holds true with inequalities and equations. Because so many misconceptions in algebra... a good example is like, you have an equation that is $4x+3x=10$, and then you have an equation that is $4x=3x+10$... you know, sometimes you have two sets of a variable on one side of the equals and sometimes you have them on both, and kids just end up memorizing this rule: "When they are on the same side

of the equal sign, I combine them, and when they're on different sides I take away one." And they kind of learn that thing, but, this would really help them see, it depends what lens you're really looking at it with.