

SALLY KEYES: Your students were great. It was nice having you to do it. And we really appreciate the opportunity to be here and to share with you. So we're going to open it up and let you begin. And so we're going to let you talk first about your assessment of your lesson and how you think it went. And you raised a couple of issues at the beginning about several students in which, um, Deb wasn't able to hear that but Kamaljit and I were. So we're willing to offer those pieces of information to you afterwards, but we're going to let you start and begin first.

CECILIO DIMAS: Okay. Well now that the lesson is over and looking back upon the lesson, I definitely feel that there was a range of growth among those students and a range of debunking some misconceptions. Though I still feel that there are some misconceptions that we'll need to address, and that's some of the things that we'll be able to address as we look at Student E's work and Student J's work and continue on with tabular representation throughout the school year. Um, but I feel that we had some good discussions amongst the students' individual shoulder partners as well as the group regarding mathematical sense and that things can make mathematical sense, even though there's error in matching up with the DVD Plans. So I was intrigued by that part of the conversation that we had in class. Um, and I also found that, should be useful, that students were able to record their findings in their little DVD packet plans.

SALLY KEYES: Anything else within the lesson that struck you that you'd like to add?

CECILIO DIMAS: I think that, um, one part of the lesson that, um, I'm recalling right now, regarding that, would be, that when we're looking at the different tables and asking the question "What is the mathematical purpose?" that there isn't that instant connection to the prompt. And that's the guiding light, and that's the reason why we're working with these tables, so I would like to go back and work on that connection some more. Again, having the kids realize that the whole reason why we're doing this is to answer their question of "Will those three DVD plans match?" And have that be the guiding light for investigation.

SALLY KEYES: And now I open up to the observers then, to share with you comments or things that may help clarify, flesh out some of the issues that you raised, some of the things you brought up earlier because we were able then to hear conversation among the pairs. So, I open it up to the observers.

KAMALJIT SANGHA: Well, I'll just start with, um, I think it was Amir who had said, when he was talking with his partner. He said, "I set up a t-chart with three tables." And that to me was fascinating because he's seeing his t-chart. Is it a table within it? Are there two different things, like a t-chart be just like a table? So that I think we do need to, in the future address it with the students - What is a t-chart? What is a table? Can the t-chart do the same things as a table? Are they different or are they the same?

CECILIO DIMAS: I also just thought about, I recall the part about zero and the conversation around zero, and I feel that that's definitely something that I would like to explore further with the class, um, in more definite and to a greater level of understanding about the role of zero, the value of zero, and what we can learn by including zero in our table, even if it is a little more challenging. A student raised the idea

of just scratching it out, so we don't have to worry about it. And so I would like to continue that conversation as well.

KAMALJIT SANGHA: Because I think, this piggy backing on that, one student said, "Zero should be a thirteen." They think right away they're paying the twelve plus the (inaudible) and they're not saying, they're not making the connection between you're not renting any videos, so you're just paying the fee just to be a member; and whether you rent it or anything, you still owe that \$12. That needs to be cleared up.

DEB NEGRETE: Oh, one of the things that I saw was when the students were able to read the actual plans, which we had to have them revisit then they got the zero. So the two groups I worked with, that's what they wanted to do, they wanted to move it to thirteen. And then I said, "Look around right there, the plan." And they said, "Oh, it's just \$12 for the month." And that click happened several times, so you're right.

SALLY KEYES: What I love about being reflective and looking at lessons is that that is a piece that kids didn't go back and referred to the charts that we had up there. So putting it on a piece of paper, everybody would have it, and it was loose, and you could use it for any plan. And you could have that information, I think it would really be good for the student work.

KAMALJIT SANGHA: And not just to have the paper, but the teacher would have to remind them, "Now let's look at the plan and check the prompt and what's happening with the table." So they refer back and forth, yeah.

CECILIO DIMAS: So it sounds like we're going to, um, then to refine this, we're going to put all three different DVD Plans on one handout and maybe even include the prompt...

SALLY KEYES: Oh, we could do that.

DEB NEGRETE: And the prompt would be good. Absolutely.

KAMALJIT SANGHA: And then the teacher can verbally also remind, "Let's refer back to the plan and see if this is what's happening."

SALLY KEYES: I'd like to just go back to the zero for a moment. I thought it was really nice the way it came up in the conversation and the disequilibrium because there were some who felt comfortable, and it was important, and they can make sense of it, and others that couldn't. And we knew that that was an issue, which is why we chose this as the second student work because we know even when you didn't get to Student E, zero is in there as well; and that has to be the correct table. But then we were going to pose the questions for the comparisons of similarities and differences between the three, and move, not only to the prompt of when are they costing the same amount of money at how many rentals, but then moving to those prompts of "Well, so when is Movie Busters the better deal? When is Online Flix the better deal?" So where is that cutting or breaking point for each one of those, let alone for when it just cost the same? So, um, I thought it was very rich that way, that there was, um, that students were as articulate as they were about that notion of zero. So to me it was like, okay, so this

really leads into this potential of a really good mathematical understanding of what zero will tell us and not tell us.

CECILIO DIMAS: And I'm excited about that this conversation has started about zero for when we are working with graphing, what's the data in our table then we can continue that conversation and that representation, and talk about the point of origin, and talk about possibly crunching our number line, and all of our x and y-axis, and all of the elements of graphing. It's exciting that this is going to give us a talking point.

SALLY KEYES: And that is why we designed, specifically designed it purposely to do the verbal and then to do the table first. So it's interesting because they can answer that question without the zero.

KAMALJIT SANGHA: And the interesting thing with this class, to see would be to go onto J and then coming back, why is zero important, when is zero important.

SALLY KEYES: And so we should probably explain a little bit about J. J is a student who didn't do things one by one as far as the number of movies; he did things in groups of three. I think he began with zero and then he did three, and then six, and nine, don't quote me, but anyway. So he left out pieces, but it was a good conversation about, it would be a good conversation, which follows then...

KAMALJIT SANGHA: And then also for them to see E. Was E the one that was correct?

SALLY KEYES: E's the next.

KAMALJIT SANGHA: So when we see E and then see how the correct one was done and then they can go back and relate to the mistakes again.

SALLY KEYES: And then you come back with J, which then is done differently. So then can we really make those...and we maybe be able to determine when they cost the same, but are we going to be able to determine when it's that way or not because...do we have enough information?

SALLY KEYES: I know that Cecilio had asked us to take some notes on Charles as well as Melanie, and Daniel, and... So are there any other information from different pairs that you'd like to share with Cecilio around either the issue of zero, or the issue of understanding the table, or forgetting the plans or...

DEB NEGRETE: The two I watched had a good understanding of the mathematical understanding and I was pleased with that. When I moved over to the other two there was the confusion about right and wrong versus mathematical understanding. So I was pleased at first watching their growth and then realized that the group next to them were still struggling with that. The "correct answer" is still kind of where they want to be sometimes.

KAMALJIT SANGHA: And realizing that mathematical it is correct but just somewhere it fell through.

SALLY KEYES: But I did hear Jocelyn and Charles. Charles, um, tended to dominate, mainly because his color card was the first; he got to go first but then...yeah sometimes and then Jocelyn. But I was pleased

that she didn't, she wasn't shut down. So even though Charles would say something, she would volunteer and clearly her thought process wasn't nearly as what Charles' thought process was, but she was able to articulate what she was thinking. So I think that it was a good pairing in that sense. I don't think she loses sight of herself and what she's trying to figure out, even though she was a little shakier, obviously she was shakier.

DEB NEGRETE: She was but she had such confidence, even though she got lost in her...trying to analyze what she was trying to say and trying to talk it out. I was actually pleased with how well she still continued and she got off a little bit, but you do a great job in pulling them back in, in saying, "Do you need some help?"