SUZANNE MCSPADDEN: I'm Suzanne McSpadden and I'm a math coach at the Jefferson School District.

PATRICIA FERRANT: Hi, I'm Patty Ferrant and I teach at Pollicita Middle School in Daly City.

ANTOINETTE VILLARIN: Hi, my name is Antoinette Villarin and I teach 7th grade math at Fernando Rivera Middle School in Daly City.

SUZANNE MCSPADDEN: The lesson you're going to be doing today is a re-engagement lesson based on the task. Would you like to describe the task that you used as the basis for this lesson?

ANTOINETTE VILLARIN: Yeah. It was a...we chose a 7th grade task called "Pizza Crust" and it involves area and perimeter, and asks students to find and calculate the area of pizza boxes and the perimeter. And I think the different pizza boxes were squares, rectangles, and circles. And then the questions, as it slowly develops, it started to give them constraints where given a certain area, what would be the different perimeters.

SUZANNE MCSPADDEN: Can you talk a little bit about what re-engagement is and how you came to it?

ANTOINETTE VILLARIN: Right now we're thinking of it as follow-up lessons on formative assessments. So we've given our students an assessment; kind of looked over what they know and what they don't know and their misconceptions. And this re-engagement lesson is a lesson that we're using as a follow-up to address those misconceptions.

SUZANNE MCSPADDEN: So how did you go about preparing for this particular lesson?

ANTOINETTE VILLARIN: Well, first we gave our students the "Pizza Crust" task to see what they know and then Patty and I, or Patty graded it and we looked at how students did. Then we analyzed and made a list of what they really struggled with conceptually. So, it was like distinguishing the difference between area and perimeter. We took notes on that and just kind of looked at what their strengths were and what their weaknesses were, and then developed our lesson based on that.

PATRICIA FERRANT: We didn't want to focus just on the skills. I mean, they've been since fourth grade calculating area and perimeter, and what we've found is a lot, in this class a lot of the students do know how to calculate area and perimeter. But how to prove it, justify it, really, um, given constraints understand what it means, um, they were struggling with that.

ANTOINETTE VILLARIN: And also the relationship between area and perimeter, like how they are related rather than seeing them in separate. We saw them struggle with that too.

SUZANNE MCSPADDEN: So you've addressed two of the big mathematical ideas that I think are present in your lesson -- both understanding the concept as opposed to the skill of calculation, and being able to both communicate or justify, prove and communicate students' understanding of what area and perimeter are, and how they are different, how they are related. Are there any other big mathematical issues that you wanted to address in this particular issue, or lesson?

ANTOINETTE VILLARIN: Proving why, going in depth rather than just knowing "I'm multiplying length times width." Knowing why they do that and how you can prove it in the picture. And then really, this lesson because it is a 7th grade standard, we want to focus on that relationship. Like "Given a constraint of area, what are all the different perimeters you can find?" which is different than what they've probably done in the past, in elementary school.

SUZANNE MCSPADDEN: Would you describe the general flow of the lesson?

ANTOINETTE VILLARIN: Okay. Well, we, uh, because based on the student work, we realized that a lot of kids were confusing the two. Like, we would say, "Find area, can you...or find the perimeter" and they would be calculating area or vice versa. So we decided to front-load a lot in the beginning of this lesson where we talked about those differences, and I think pair share and we talked about what it means to prove something. Like, how do you prove the area instead of just saying, "Oh, it's sixteen square units." Like, what does that mean and how can you prove that. So the beginning of our lesson is a lot of that front-loading. Um, the big part of our lesson, the part that we find really important, not that that part is not important, is the addressing the misconceptions. So Patty and I made a few posters and we picked five examples of student work that we looked, um, on the "Pizza Crust" problem with, and we chose five and we made posters for it. Or four? We made four of them. And students...and we're going to have students do error analysis on that. Like, what was the student thinking? Is there any advice you can give the student? That is a big part of our lesson that we want to get to.

PATRICIA FERRANT: Stating that the name of the student in the "Pizza Crust" problem is Robbie and stating that Robbie is confused about area and perimeter, what advice can you give him? How can you keep helping him? And then saying, "Well Robbie thinks this but his friend thinks this. Who do you agree with and why? Prove it." And even going more is showing, well, Robbie is still a little confused and taking some of that student work and saying, "This is what Robbie tried. Is he on the right track? What did he do?" And hopefully having them see that this was confusion with perimeter, not area. The last part is actually the part that almost every student struggled with when we went through the task; and that was designing different rectangles that had an area of thirty-six but different perimeters than the square.

SUZZANE MCSPADDEN: I like to just point out that the flow of your lesson really emulates a Noyce task. You have that entry level, you have the core mathematics in which the students are asked to address those misconceptions that Robbie had and that the students have, and then you've taken the ramp...you've ramped it up by asking them to actually work with those constraints within the area of rectangles and squares.