

CECILIO DIMAS: This opportunity has really reminded me also of aspects of lesson study, where we have had the opportunity to work with the different periods throughout the day and make revisions. And I'm really eager to apply what we brainstormed and put it into action with fourth period, so we'll see what happens.

ANTOINETTE VILLARIN: I know. Thank you. They always get it the best because I teach it first period, second period, and then fourth period. So I feel like they get this fine-tuned lesson that hopefully ...hopefully works out today. Thank you.

CECILIO DIMAS: As we were preparing for this FAL [formative assessment lesson] with the different periods that you have, we...you gave the pre-assessment on Monday -- which today is Thursday, so you gave it about three days ago, four days ago -- and we sat down and started to look and analyze the student work and we found some trends.

ANTOINETTE VILLARIN: Yes.

CECILIO DIMAS: So what were some of the trends that stood out? Some of the things that, based off of what you anticipate students being able to do on the pre-assessment, what was in alignment with what you were anticipating, and what were some of the misconceptions that surfaced that this FAL really creates an opportunity for us to dig deeper into?

ANTOINETTE VILLARIN: Okay. So I, I think one thing that I definitely anticipated because we have not had experience -- or they have not had experience yet with going from a graph to an equation, they just know that there's four different ways to represent a situation -- was them writing an equation. So I knew that they would struggle with that part and whether or not they could write an equation.

I think for proportional graphs -- because as seventh graders they learned about proportionality -- a lot of them could do that. But the minute you added in a constant in your initial value, then it became almost harder for them to do. Another thing was this idea, like, of who was going faster, like...and that's basically rate of change.

CECILIO DIMAS: In the FAL?

ANTOINETTE VILLARIN: Yes, in the FAL.

CECILIO DIMAS: In the pre-assessment.

ANTOINETTE VILLARIN: In the pre-assessment, I think it was called The Race, if I think about what we did on Monday. And they -- half of them were saying Maggie and half of them were saying Emma for different reasons. Like, one thing that stood out was they thought Maggie was the faster runner because her time...like, her graph was a higher graph, okay, whereas other students started to see that, "Well, it's...it's like a steeper line, and what does that mean?"

But it was...it was really hard for them to interpret it. So I think that...those were like the first two questions on the pre-assessment, and it just meant, like, "Wow, when we do this FAL, that's probably what I'm going to...or that's what I'm going to focus on, is the rate of change." And I think you saw it too. I think we tallied...we were tallying, like, how many times somebody said Emma, and it was literally half for the classes.

CECILIO DIMAS: And seeing that on the pre-assessment prompted us to re-engage the students with the same graph, removing all the questions so it was the same context. And we really have...we asked them a lot of clarifying questions and had them do a lot of partner discussion, accountable discussion where they were discussing with the purpose and creating a product, whether it was a list or a diagram or a drawing.

But we also had them make sense of fraction notation that was surfacing for some of them, and so looking at ratio and rates in fractions, and slope, and having that conversation. So can you tell us a little bit more about the instructional decisions you made based off of the re-engagement, and then what came next before we started the FAL lesson?

ANTOINETTE VILLARIN: Yeah. So we...so after we...so we did that on Monday and we stayed after school and we, we...calibrated, like, how we would score it based on the solution key and talked about what trends we were seeing. So then on Tuesday, we knew that we had to do some kind of re-engagement -- a re-engagement on looking more closely at a graph and really reading the components of a graph carefully.

And we asked very similar questions to what the FAL would ask...would want us to ask in the lesson that we're going to do today. So questions like, "What is the starting situation? What is your rate of change? How do you know? Who...who gets to the end of the race faster?" And we took all the questions off, and we used it more as a discussion piece. So it was almost like, "Here's a graph. You have the graph in front of you. Let's talk about it. Turn and talk." And we did that.

And I think that was really useful because I think it really told students...at the end I think a couple of kids...we said in one class we had time to do a reflection, and we had asked them, "Could you tell us what you understood or learned?" And it was, "I learned that I need to look at a graph more closely," or "I know now to look at a starting...starting point." So I think that was really helpful to do. I also think the idea of fraction, rate, ratio and that multiple meanings of a fraction notation was also really helpful because students were calling the slope a fraction. And so it wasn't really a part-to-whole relationship, and we really had to fine-tune when you're looking at how something changes over another quantity changing, so that's really, like, when we think of a part-to-part. And so I think those discussions were really valuable going into it.

CECILIO DIMAS: This FAL also reminded me of another one called distance...interpreting distance-time graphs.

ANTOINETTE VILLARIN: Yes.

CECILIO DIMAS: And from that FAL where the students are being asked to label the...the context on the graph, we also brought that in, in the re-engagement as well, where we...where there was a point of intersection during the race. Like, what does that point mean? And then what's...where was Emma in relation to Maggie before the point of intersection, and where was Emma in relation to Maggie after the point of intersection? Where were they at the point of intersection? Through that re-engagement, we also were attending to precision with math ideas but also with language.

ANTOINETTE VILLARIN: Yes.

CECILIO DIMAS: Some of the students were simply just restating what they see on the graph without connecting it back to the context.

ANTOINETTE VILLARIN: And having a story connect with it.

CECILIO DIMAS: Yes.

ANTOINETTE VILLARIN: And I think a lot of them, like, had not seen a graph intersecting, and what that means before the intersection, and what it might mean in the story after. So that discussion was really good, even though in this FAL there's not an intersection of graphs. Like, it's like two separate graphs, but if you were to place it together, it'd be neat to see it placed together.

CECILIO DIMAS: That might be a nice extension for us to consider. Yeah.

ANTOINETTE VILLARIN: I know. I was just thinking that. I was just thinking about that because since the pre-assessment and post- had double graphs, it might be neat to try to put these together.

CECILIO DIMAS: Another thing that might be nice to do would be to save this, and then when you're looking...when you're working with systems of equations...

ANTOINETTE VILLARIN: Yes. Oh, that's actually coming up, I think in my curriculum.

CECILIO DIMAS: This might be a nice way to revisit a former context, because you've invested a lot of time into building a common understanding of the context that we're working on with the container -- with the two prisms -- and the constraint of six, and rate of change.

ANTOINETTE VILLARIN: And starting value.

CECILIO DIMAS: Yeah, it's a starting situation and all those key pieces, so maybe that could be a consideration...would be to utilize the context of this FAL for future work. Because there's...you have multiple representations to work with, and you can definitely do more.

ANTOINETTE VILLARIN: It'll definitely be, like, something that they can anchor onto.

CECILIO DIMAS: Yes.

ANTOINETTE VILLARIN: Because it's something that we've spent so much time doing, so...yes, like, the wheels are turning! Because it would be the next unit, I think, would be systems.

CECILIO DIMAS: One of the other things that we noted, too, was as we look at students' agency, identity, and authority in the classroom -- that students who had maybe felt like they couldn't share with the protocols that you've been utilizing in the classroom, that some students who were a little bit quieter actually being a little more vocal in sharing their ideas. And so hopefully they'll continue to do that even through the filming process, that they won't "shy up" again.

ANTOINETTE VILLARIN: I know. And I think it's just because of that...that one recommendation where it was "turn and talk to your partner," and we were talking about, like, how do we get them to push their thinking and talk a little more. And it was giving very...being really explicit about the purpose. Like saying, "Okay, turn and talk to your partner with the purpose of... and make sure that this is the purpose you're doing that." And I think that alone, like, changed...it changed for a lot of students. Whereas prior it was just, "Okay, share with your partner what you have." So I think just that alone was a really powerful small change that happened, and I'm hoping it continues. Yeah.

CECILIO DIMAS: Thank you, Antoinette.

ANTOINETTE VILLARIN: Thank you.