

CECILIO DIMAS: So as you work on this FAL [formative assessment lesson], what are we going to see and hear students doing mathematically?

ANTOINETTE VILLARIN: So they're going to be -- there's a whole-class piece first that students will be listening to, and then I'll be doing a lot of "turn and talk to your partner about how you see a graphical representation represented in real-life situation."

So they're trying to match what the graph might mean in a real-life situation. After we've done -- developed, like, kind of whole-class understanding of what that might mean, then I'll have students match graphs together. And they're going to take a graph, and they have this large container that they're going to imagine, and they have to decide whether or not the top prism of the container is being represented in the graph or the bottom prism. That's kind of like the first step, and then they have to think about what it might mean with the rate of change as a liquid is flowing out of the top prism into the bottom prism.

And it'll make more sense when you actually see the...the shape of the container, but I think students will be definitely matching. Some of the math that they'll be doing is they'll be talking about the rate of change and how that might look graphically. They'll be talking about slope, I'm hoping, and seeing that as either an increasing or a decreasing graph. And when you see an increasing graph, what that might mean in the real-life context. When they see a decreasing graph, what that might mean in a real-life context. And then I'm also hoping that they start to talk about the initial value or the starting point, because I think that's really important especially if this unit is slowly to lead students to thinking about slope intercept form, and what an equation might mean in slope intercept form. So I think that I'm hoping that the math behind it that they practice today will be on looking at the initial value as well.

CECILIO DIMAS: So as we work with the students, we're going to be seeing them have time to collaborate with their...with their partners at their table. They're going to engage in whole-class conversation, have an opportunity to do a card sort.

ANTOINETTE VILLARIN: Yes. Yes. And also gallery walk.

CECILIO DIMAS: With the gallery walk as well. What's unique about your school structure and your bell schedule is that you have a block schedule almost every day. Correct?

ANTOINETTE VILLARIN: Yes.

CECILIO DIMAS: So today we have...

ANTOINETTE VILLARIN: Eighty...maybe eighty-three minutes to start.

CECILIO DIMAS: Eighty-three minutes. Okay. Excellent. So as we switch over to the cognitive demand dimension...what I'm curious about...I'm curious about... So as we look at cognitive demand, what are the intentional purposeful times in which you're going to be creating a space for students to struggle with the mathematics, and make sense of the mathematics on their own?

ANTOINETTE VILLARIN: Okay. So I definitely think the matching activity is going to be a point where students struggle. I think the whole-class lesson that will...that I'm planning to do in the beginning if...when I'm following the FAL, is to just kind of make sure that we're using the correct language, and we're learning how to build arguments using proper sentence stems and academic vocabulary.

So that's my goal out of that and that they understand kind of the constraints of the problem. But when they actually start matching it, I'm just going to see what they do.

I think, I'm going to...I may ask questions, and push, and monitor, and see what they're thinking, but I'm not going to intervene and I'm not going to help in a way that provides answers for them, because I want them to come up with it on their own. I will, though, if I do notice, like, a common misconception happening, I may check in, but I think I'll ask questions to kind of push where they might be going if I see, like, everybody commonly doing something incorrect.

CECILIO DIMAS: Okay. Anchoring our next part of our conversation on access, and providing students with access to the content, and being mindful of the role of language in mathematics, how are you planning to support students, one, with having the opportunity to engage in discourse, and two, provide supports?

ANTOINETTE VILLARIN: Well, this class is very unique in that they're my class at the end of the day, and they're very quiet, and energy can be really low, and discourse can be something that we've been working on for quite a bit. So I really have to structure it so that they understand the expectations of who's going to speak and what you're going to say.

So I've been including a lot of structured partner talk, where Partner A will make sure that they talk to Partner B, and Partner B will either rephrase and state that. I'll also make sure that when I ask them to turn and talk, there's a lot of purpose in what I'm telling them and I make that explicit for them, and that there's some kind of product, whether it's writing something down or sharing with a partner what they have, and then modifying an answer they have. I have to make that really specific for this class.

I also think sentence stems are really important for this class in terms of providing opportunities to make it very accessible, and to make sure that they're talking to each other. So I have posters of just sentence stems to get them started on how they may speak academically with each other when they're building their argument. And also at the end, we'll do a gallery walk where I'm hoping students will be able to kind of justify their thinking and walk around and be able to compare what they currently have and their current reasoning with their partner, and then compare it with other people. So I'm hoping to build lots of structure so that they are just kind of building on their thinking.

CECILIO DIMAS: And since they're...the students are going to be coming in right after P.E. [physical education] --

ANTOINETTE VILLARIN: Yes.

CECILIO DIMAS: -- that's part of the change in energy level. So it is part also of the classroom culture and norm for them to have a healthy snack during this time period, and so I just wanted to point that out.

ANTOINETTE VILLARIN: They will have, like, grapes and they will have fruit. I allow granola bars and fruit, but they travel as kind of a group and they all have P.E. right before me. Yeah, which does explain the...the low energy.

CECILIO DIMAS: The energy, maybe the sweatiness and the snacks.

ANTOINETTE VILLARIN: Yeah. The sweatiness, yeah.

CECILIO DIMAS: One of the things I'm also really excited about as we've been working together with this particular class and this unit of study is the opportunity to see them really turn to each other as mathematicians for support and clarification, expanding their audience beyond the teacher as far as who they're constructing an argument for. So can you tell us a little bit more about how you are purposely supporting students with developing themselves...developing their identity as a mathematician?

ANTOINETTE VILLARIN: Yes. So I -- I am definitely not going to be one to give them the answers, and they know that. And so a lot of times my questioning techniques of "how do you know?" will really push their thinking, or "how do you know these two cards are going to be a match?" or "how do you know that this is a top prism or this represents the bottom prism of the activity?" So I'm definitely going to use a lot of questioning techniques. I also want to create opportunities where everybody has a chance to speak.

So I *do* do a lot of partner work, and they are going to work in pairs on this activity. And I'll switch it up where students, like, where Partner A will maybe go first and Partner B will go second, so that everybody has a chance to speak. Also when we do our gallery walk, I have what one person does is they kind of travel around the room to compare answers, and one person stays and defends their work.

And so I'll switch that role up the second time we do a gallery walk because what you'll notice in the lesson is we'll first do one gallery walk after they've matched the graphs together, and then I'll give them the prisms in a real-life situation and what the model looks like, and then they'll match that. And then we'll do either another gallery walk, and then I'll give them the equation. So it's kind of like three-tiered in a sense. And then they're also a really shy group, so I think really creating those sentence frames and making sure that they're pushing themselves to use the academic language, I think will be really important.