ANTOINETTE VILLARIN: All right, so today in class, I'm excited -- we are gonna start to look at coordinate geometry, okay. And today you're gonna be given a task where you're solving a problem on a coordinate plane, okay. And that's where coordinate geometry takes place -- [inaudible] let's put the book away, okay, yeah. So, the problem you'll be solving, you'll be placing on a coordinate plane, and that's pretty much what coordinate geometry is. We're gonna be taking shapes that you guys have been kind of loosely placing on your binder paper and thinking in space, and we're gonna place it on a coordinate plane, okay? We're gonna see what you know about what happens when you do that, okay?

Today we're gonna start with a Three Read, and the problem that we're gonna work on is called "Whitebeard's Treasure," okay? And just like we normally do with Three Reads, the first time I read it you're gonna think what it's about, the second time I read it you're gonna jot down some quantities, those are numbers with labels that you hear, and then the third time you're gonna think of math questions, okay? Now in front of you, in your trays, are pieces of paper. I'd like you to take one that says "Whitebeard's Treasure" and you'll see a space for you to actually write notes for the first read, notes for the second read, and then notes for the third read, okay? So, using your pencil, I'd like you to have that out.

All right, are we ready? Okay. Is there anyone that still needs to take a paper? Yuta, do you have a paper in front of you? From the tray? All right, thank you. Okay.

All right so first read, here we go, listen carefully. "Whitebeard's Treasure. Whitebeard, the notorious pirate of the West Bay, buried treasure on Tiki Island over 200 years ago. Archaeologists recently discovered a map showing the location of the treasure. The location has generated quite a bit of media attention, much to the dismay of the archaeologists. In order to allow both the media and the archaeologists to work together, officials have decided to erect two fences around the location. One fence encloses the actual area where the archaeologists will work. Another fence surrounds the enclosed dig area, allowing media access to the sites." Okay, so for the first read, just in that first read box, just tell me what it's about. Okay, without telling me any quantities, what, so far, is this about? The first time you heard this story. Would anyone like to share? Logan?

STUDENT: Uh, basically, this guy named Whitebeard buried some treasure on some island, and recently archaeologists found a map, but a bunch of people wanna go find the treasure for themselves, so now, like, the archaeologists can't go dig, so they need fences.

ANTOINETTE VILLARIN: They need fences, okay. All right, perfect, okay. Anyone wanna add to what Logan said? Izzy?

STUDENT: There's two fences, one where they dig and one around, um, I forgot where the second fence was.

ANTOINETTE VILLARIN: The archaeology site? Yeah, the archaeology site, okay. Perfect. Two fences. Okay, I'm gonna read it a second time. This time in the second box, I'd like you to jot down some numbers and quantities, numbers with labels that you think are important, okay?

"Whitebeard, the notorious pirate of the West, buried treasure on Tiki Island over 200 years ago. Archaeologists recently discovered a map showing the location of the treasure. The location has generated quite a bit of media attention, much to the dismay of the archaeologists. In order to allow both the media and the archaeologists to work together, officials have decided to erect two fences around the location. One fence encloses the actual area where the archaeologists will work. Another fence surrounds the enclosed dig area, allowing media access to the site."

Go ahead and jot down some quantities that you heard me say in the story prompt. All right, turn and talk to your partner, the partner that you've been working with, and I'd like you to tell your partner some numbers that you heard me say, some quantities that you heard me say, out loud.

[background talking]

STUDENT: Okay, generally, all I heard was two fences.

STUDENT: Two fences, yeah, that was basically it.

STUDENT: Yeah, there's no ...

STUDENT: And then I heard that one goes to the archaeologist's area, like where they're gonna be working, and one is for like, I guess the hole surrounding the dig site that like, the media can access, and shoot some pictures. And I mean, the only other number I have is "200 years ago."

STUDENT: 200 years but that has really nothing to do with ...

STUDENT: That's not really relevant.

STUDENT: Yeah.

ANTOINETTE VILLARIN: One, zero, okay. All right, what numbers or quantities popped out as I read the second time? Niki?

STUDENT: Two, ’cause two fences.

ANTOINETTE VILLARIN: Two fences, okay. Anything else pop up? Yuta?

STUDENT: 200 years ago.

ANTOINETTE VILLARIN: 200 years ago, okay. Any other numbers that popped up? No? Okay. Sebastien?

STUDENT: One fence around the archaeologists and then one fence around the dig site.

ANTOINETTE VILLARIN: One fence around the archaeology site and then one fence kind of around it, where the media goes, okay.

ANTOINETTE VILLARIN: All right, perfect. I'm going to need a third person to read this, and then we're going to see if we can come up with some questions based on just the story prompt that you've heard. Okay? Is there anyone that wants to read this out loud?

STUDENT: No.

ANTOINETTE VILLARIN: Ben? Go ahead. Thank you.

STUDENT: Whitebeard's Treasure. Whitebeard, the notorious pirate of the West Bay, buried treasure on Tiki Island over 200 years ago. Archeologists recently discovered a map showing the location of the treasure. The location has generated quite a bit of media attention, much to the dismay of the archeologists. In order to allow both the media and archeologists to work together, officials have decided to erect two fences around the location. One fence encloses the actual area where the archeologists will work. Another fence surrounds the enclosed dig -- dig area, allowing the media access to the site.

ANTOINETTE VILLARIN: Okay, thank you. Okay, so quietly for one minute, I'd like you to come up with a math question that you think I might ask, or might be asked in a math class. And go ahead and write that down next to the third read on your handout. All right, when you're ready, I'd like you to share your question with your partner. Okay? I will come around and look at some of your questions and listen in on some of your questions. And then, instead of listing all the questions that we come up with, since you have it written down, I'll have a reference for it. I will call on three people to actually list some of the questions out. Okay? So, you're gonna turn and talk to each other with the purpose of sharing your question. And then, I'd like your product to be a mental note to be ready for me to call on you, so that if I call on you, you can tell me the question you either said or a question you heard that you'd like to share with the class. Does everybody understand that? Okay. Go ahead and share your question.

STUDENT: So, I said, "If the archeologists' fence is 20 feet by 50 feet and the media's fence is 10 feet away on all sides, what are the dimensions of the media's fence?"

STUDENT: I put: "If the entire [inaudible] and the second fence must be two times larger than the big side, what is the perimeter of …"

STUDENT: What else?

STUDENT: I'm not sure, I think it depends on how you --

STUDENT: What else would there be? Besides ratios of the perimeters and the areas, we could find --

STUDENT: So like, would this be it and then they go around it? Well, that's what I thought.

STUDENT: Well, I -- They expect you to define more details while --

STUDENT: Are we assuming this is a circle or a square?

STUDENT: That's just like --

STUDENT: A fence?

STUDENT: A fence.

STUDENT: A circle. Yeah, Ben. Ben --

STUDENT: Sure, sure. A fence. Okay.

ANTOINETTE VILLARIN: One. Okay, um. So, I'm gonna call on a few people randomly and ask you for your questions. If I don't get to your question, you do have it written down and I'll get to see that when you guys turn this paper in later, okay? All right, um, Claire. Could you share either your question or a question that you heard your group say?

STUDENT: My question is: "What is the area between the first fence and the second fence?"

ANTOINETTE VILLARIN: "What is the area between the first fence --" Oops. [laughs] Okay. "First fence and second fence?"

STUDENT: Yeah.

ANTOINETTE VILLARIN: Okay. All right. And when you say area between the first fence -- [crosstalk]

Oh, face! Thank you. [laughs] When you say the area between the first fence and second fence, what do you -- What do you mean? Like --

STUDENT: It means like the area that the archeologists are like allowed to walk in.

ANTOINETTE VILLARIN: Okay. So, the difference between the two? Okay, good. Thank you. All right, Chenrui -- Thank you, Claire. Can you read me either a question you wrote --

STUDENT: What's the --

ANTOINETTE VILLARIN: Or someone that you heard? Okay.

STUDENT: This says: "You can't really solve any of the problems that -- without having to first assume something." I assumed that the first square was, say, 12 feet away from the larger square made by the fence.

ANTOINETTE VILLARIN: Okay. So can you read --

STUDENT: And --

ANTOINETTE VILLARIN: Can you read it in the question?

STUDENT: Yeah. "Assuming the larger square is 12 feet from the smaller square, what is the difference in area of the squares?" It's basically --

ANTOINETTE VILLARIN: Okay. So, say that again. Assuming the larger square --

STUDENT: Is 12 feet --

ANTOINETTE VILLARIN: Is 12 feet.

STUDENT: Larger.

ANTOINETTE VILLARIN: Larger.

STUDENT: Than the smaller square.

ANTOINETTE VILLARIN: Than the smaller square.

STUDENT: What is the area.

ANTOINETTE VILLARIN: What is the area.

STUDENT: Between the squares?

ANTOINETTE VILLARIN: Between the squares?

STUDENT: Yeah. Basically, it's like Claire's.

ANTOINETTE VILLARIN: All right, kind of like Claire's. But you're now giving it kind of a parameter --

STUDENT: Yeah.

ANTOINETTE VILLARIN: -- since we don't have enough information in the problem given. Okay. Thank you, Chenrui. Okay. And then the last one is -- Kiara, can you either read your question or a question that you heard your group share?

STUDENT: Um. "What is the ratio of the two fences?"

ANTOINETTE VILLARIN: "What is the ratio of the two fences?" Nice, okay. And when you say "ratio," what are you looking at? Areas? Are you looking at length?

STUDENT: Um. Areas.

ANTOINETTE VILLARIN: Areas, okay. "What is the ratio of the areas of the two fences?" Okay, good. Okay. So, I'm gonna leave these up here, just like we always -- [crosstalk]

Oh, gosh! I always do that. I'm sorry. I probably should've written it out instead of typed it, because I'm not a good typer.

STUDENT: [inaudible]

ANTOINETTE VILLARIN: Oh, did I mess up? [crosstalk] Oh, twos. Thank you. [laughs] Thank you.

All right, so I'm going to leave these up here like we always do. And if we finish our prompt early, these are some questions that you can start to look at. If we don't finish this lesson and it continues into Monday … then I will, um, list some of the questions that I'm seeing on your paper. Okay?

ANTOINETTE VILLARIN: So I'm now going to give you the actual prompt. It's going to be on purple paper. There is two parts. Part one is first on purple. When you get it, I'd like you to read part one, and then start to solve part one with a strategy that you'd like to share with the class, okay? So, um, there is graph paper if you need it. There are rulers in the middle if you need it. There are supplies all in your group tray as you need it, 'kay? Take two minutes and three seconds to quietly read part one and begin a starting strategy for how you might approach this problem.

STUDENT: Thank you.

ANTOINETTE VILLARIN: Okay, you're welcome. [inaudible] was this the extra piece of paper. I think I gave you guys extra. Okay. All right, again, so take two minutes and three seconds to read part one and then go ahead and begin to solve the problem. Ready to share at least your starting point with the problem. There are also rulers, so if any of you need rulers.

All right, as you are working, um, I'd like you, when you are ready, to share with your partner what the question is asking you to do in part one, and what your starting strategy is. Okay? So as soon as you're ready to talk to your neighbor, what is part one asking you to do, and what is your starting strategy -- what are you doing first? Answer that first couple of questions for part one, okay? I give you one minute to think about that, and then be ready to share with your partner.

All right, I'm going to ask everybody really quickly to put your pencil down, okay. Put your pencil down. All right, turn and talk to your partner and tell your partner what is part one asking you to find, and what are you doing first as you're all quietly working. 'Kay? So turn and talk to each other. What is part one asking you to find, and then what is your starting strategy, what are you doing first as you are quietly working, 'kay? Go ahead and share with your neighbor.

[students talking]

STUDENT: It says draw and label the quadrilateral -- qua -- quadrilateral on the graph paper --

STUDENT: Yeah, that's what I'm doing.

STUDENT: -- to show the two fences.

STUDENT: How'd you get straight lines?

STUDENT: Yeah, so we basically like plot the points of the, like, what it says here and then we have to connect the points and then find the midpoint of the shape.

STUDENT: What is that? I don't know. What is that?

STUDENT: A.

STUDENT: A and ... what's that?

STUDENT: B.

STUDENT: Wait, do we connect the points?

STUDENT: No -- they shouldn't be straight.

ANTOINETTE VILLARIN: 3, 2, 1.

STUDENT: Okay.

ANTOINETTE VILLARIN: All right, so I stopped you earlier, because you were all very eager to work quietly on the problem, but I wanna make sure that everybody knows what the question is asking you to do, okay. So Ben, can you share with everybody what the question in part one is asking you to do?

STUDENT: It's asking us to graph the points, and then [inaudible]

ANTOINETTE VILLARIN: That's it, okay, so part one's asking you to graph the points. How about in question two in part one? What's it asking you to do? Joshua?

STUDENT: Label the midpoints.

ANTOINETTE VILLARIN: Label the midpoints, okay. Does anybody know what the midpoint is? Or what -- how you would describe a midpoint? Because that might be a new vocabulary word for us in geometry.

STUDENT: Point in the exact middle of a line.

ANTOINETTE VILLARIN: Okay, the point in the exact middle of a line, okay. So what your challenge is today, is to find the midpoint using a strategy that is unique to you, and also one that you would be willing to share with the group, okay. So, part one -- oops, I'm sorry -- is asking you what the midpoint -- be ready to share how you're finding the midpoint, of that segment. How do you know that's the midpoint? And can you find the midpoint another way? Those are questions that I really want you to think about, okay. Because our goal today is to start to use coordinate geometry to justify your thinking, okay. So as you find midpoints, be ready to share your strategy. Be ready to tell me how you know that's the midpoint, and then I'd like you to record as much as you can on your graph paper and on your handout that we did the Three Read in, okay. I also want you to do this together. So as you work, I'd like you and your partner to have a strategy that you both agree on, and I'd like you to share that, okay. Can I give you seven minutes to work on part one? Yeah? Okay, seven minutes, work on part one.

STUDENT: No, it's not even.

STUDENT: It's not even.

STUDENT: Isn't it like a parallelogram ...

STUDENT: No, it's not a parallelogram.

STUDENT: Just ignore this triangle, I just have to figure out the slopes just for the sake of that.

STUDENT: Yeah, I think I got the same shape as you, so.

STUDENT: Yeah, I just need to solve for slopes now, so, that's that.

STUDENT: Okay.

STUDENT: I forgot, how did you find the decimal?

STUDENT: Uh, what's the number?

STUDENT: Wait, you're gonna do the a squared plus b squared ...

STUDENT: I did it the hard way, look. You do this ...

STUDENT: What are you doing? Is that ... A and B?

STUDENT: That's slope. This is B.

STUDENT: It's 14 and 8. It's a triangle.

STUDENT: Sorry. Ah, my brain's not working, I told you that. What is it? 208?

STUDENT: 208, square root.

STUDENT: 14.4222

STUDENT: But then that would be nine units.

STUDENT: I don't think that really works though, because you can find the length but you don't know where it is, on the point -- on the graph.

STUDENT: True, because it's not a straight line.

STUDENT: But like, you can just guess, because we got the right answer.

STUDENT: But they're not asking you how -- the length is, they're asking you where it is.

STUDENT: So, I would get this, because it would be the hypotenuse of these two sides.

ANTOINETTE VILLARIN: Okay.

STUDENT: Yeah.

ANTOINETTE VILLARIN: And then, how would that help you find the midpoint? Like, where ...

STUDENT: Well, I know the distance and then, use a ruler? And then use their method.

ANTOINETTE VILLARIN: Use a ruler, okay, okay. Okay, use their method. So what are you gonna do with that hypotenuse, then?

STUDENT: Just find the length of it, so then I can divide that by 2.

ANTOINETTE VILLARIN: Okay, all right. So be ready to share that if I call on you. Nice, I'm seeing two different strategies so far, okay. I'm coming around to see your other strategies.

STUDENT: Look, I'm gonna go -- I'm gonna do the measuring to the Pythagorean theorem.

STUDENT: Okay.

ANTOINETTE VILLARIN: Okay, so you're gonna do some measuring?

STUDENT: Yeah, and then you just jot it on.

ANTOINETTE VILLARIN: Okay, all right. Thank you, be ready to share that, okay.

What's our strategy here for finding the middle?

STUDENT: Andrew thought of, like, using the slope?

ANTOINETTE VILLARIN: Ah, okay.

STUDENT: And just sorta, try and find two slopes and then ...

ANTOINETTE VILLARIN: Aha, so could you actually draw in the two slope triangles? Okay.

STUDENT: Okay.

ANTOINETTE VILLARIN: Okay, and when you find the slopes, how do you know that that would give you the middle?

STUDENT: So basically, when I find the slopes, these two, they have to be the entire length, but then also if I just find one and where they sort of intersect here, that means that that would be the middle since each one of these is half of this entire line.

ANTOINETTE VILLARIN: Mhm, ah okay. So you're using slope, okay. Be ready to share that strategy. All right, I'm coming around to each group just to hear some of the different strategies. So far I've heard two different ones, okay. But I'll give you guys three more minutes before we start to check in and share. Now don't forget to label, okay.

So I'll, maybe I'll -- should I share first and then have them go back and justify their work? Okay, yeah.

Did you two have similar strategies or different strategies?

STUDENT: I don't know.

ANTOINETTE VILLARIN: You don't know?

STUDENT: Same.

ANTOINETTE VILLARIN: Same. What was your strategy, Sannie?

STUDENT: [inaudible]

STUDENT: We had different strategies.

ANTOINETTE VILLARIN: So you're using the slope triangle? Okay. Divided by 2? And then Leia, what strategy are you using? Slope triangle like Sannie?

STUDENT: Yeah.

ANTOINETTE VILLARIN: Yeah? Okay. What is your slope triangle for like, the first one? What'd you guys get for AD?

STUDENT: I got ...

ANTOINETTE VILLARIN: Triangle for AD. Like Sannie, what was your slope triangle here? Did you actually -- oh, you didn't do it? Which one did you do? Okay, what was your slope triangle for AB?

STUDENT: So you guys got 6 and 18?

STUDENT: Well, 6 and 16 for this. And then we divided by 2 for each.

ANTOINETTE VILLARIN: I'm gonna give everybody one more minute before we stop and check in, okay. I know you're not done, but I do wanna check in in one minute.

I was also hoping somebody would fold it. But nobody's done that yet, so, that might be one, yeah. Yeah.

STUDENT: This is what my graph looks like now.

STUDENT: What? Oh, you have to make a square with those?

ANTOINETTE VILLARIN: Zero. I'm sorry to stop your conversations. I promise we'll come back to it, I just want to do a quick check-in, 'kay. So Zoe, if we could have a seat, okay. Um. Nice, great strategies. Great problem solving. I liked that you were actually talking together because when we actually started, you all were working individually and quietly. Um, but I am gonna have just to stop and we are gonna go back and fix your work and justify a little bit more so that you have a proof that really tells me what the midpoints are, okay? So I walked around and saw two different strategies of how you were finding midpoint. And I agree with Ben that the midpoint is the middle of your line segment. Um, how are we finding that? Okay? So is there anyone that's willing to share their strategy? I will take your paper and put it up here. Okay, Grendel, can we take your paper --

STUDENT: Oh, what? No, I don't want to take my paper.

ANTOINETTE VILLARIN: Oh, okay. You just want to share it? Yeah, okay. All right, here, let me project this up here, okay. Okay. Now Grendel, if it's hard to understand your thinking verbally, I will have to put your paper up so that we can actually see it. But let's see if you can at least articulate your thinking and your strategy for finding the middle, okay? So go ahead and share.

STUDENT: Okay, so if you want the exact answer, you find the slope triangle of a line. So from like point B to A --

ANTOINETTE VILLARIN: Uh-huh.

STUDENT: You could go up and go to the side.

ANTOINETTE VILLARIN: Could you come up here and show it? You don't have to show your work, but come up here and show it.

STUDENT: Does the -- do I have to write the numbers in [inaudible]

ANTOINETTE VILLARIN: Uh, yeah, but I do want you because I want a record of this. Can you do it on right here behind the document camera? I know we do things on the board but I don't want to have to erase it.

STUDENT: Let's say we have a -- [laughs]

STUDENT: Do you need a ruler?

STUDENT: I'm fine, I'm fine.

ANTOINETTE VILLARIN: Give him a chance to --

STUDENT: Uh, okay, so let's say we have a, like -- I guess this is 8 and this is 14. So then we can find out how long this is by using the Pythagorean theorem. And then you just divide that by 2 and you'll get how long this is.

ANTOINETTE VILLARIN: Okay, so my question is when you use Pythagorean theorem, what was the value of that hypotenuse when you had it?

STUDENT: Uh ...

ANTOINETTE VILLARIN: Can anyone that did his strategy help him? What was the ...

STUDENT: 2, 2, 2.

STUDENT: Yeah, 14. 14.

ANTOINETTE VILLARIN: Okay. Can we record that on the -- on the hypotenuse so that we see that?

STUDENT: Okay, so this is about 14.22.

ANTOINETTE VILLARIN: Okay. And then can you write your equation that showed us how you got that? Okay, now as he is doing that, how many of you used this strategy where you are finding the length of the hypotenuse? Raise your hand, because I did hear that pop up for some of you. Okay, nice. All right.

STUDENT: Wait no. Yeah that's right. No that's not. Oh, then it's not 4 -- oh, I made a mistake when I was calculating.

ANTOINETTE VILLARIN: What mistake did you make?

STUDENT: Uh. I'm pretty sure I did 12 squared plus ... I don't know for this whatever.

ANTOINETTE VILLARIN: Does everybody --- does everybody agree that it was 14.2 for those of you that --

STUDENT: No, it wasn't 14.2.

STUDENT: I think it was 16.2.

ANTOINETTE VILLARIN: Okay, so why don't you use your calculator. That's okay, Grendel. Move it up so that we can see it and then --

STUDENT: Wait, Grendel, move it --

ANTOINETTE VILLARIN: Can you move it up so we can see it? And then for those of you that are checking his work with a --

STUDENT: Where is the calculator?

ANTOINETTE VILLARIN: When you square root 260, what did you get?

STUDENT: 16.1.

STUDENT: 16.1?

STUDENT: Yeah.

STUDENT: Okay, so then --

ANTOINETTE VILLARIN: So we need to change that. Okay, that's perfect. All right, so then how'd you use that to help you find the midpoint? Because the midpoint is an actual point.

STUDENT: Well, since the midpoint is going to be half of this line, you just -- the midpoint, so you just divide that by 2.

ANTOINETTE VILLARIN: Uh huh.

STUDENT: You get 8.05.

ANTOINETTE VILLARIN: Okay. Then how did you use the 8.05 to help you get to the --

STUDENT: Use a ruler.

ANTOINETTE VILLARIN: So you actually used a ruler?

STUDENT: Yeah.

ANTOINETTE VILLARIN: Okay. Now when you used the ruler, for those of you -- and this can be somebody that somebody can add on, Grendel doesn't have to say it -- how'd you use the 8.05? Like what unit were you using for measure? Like how'd you know to go 8.5 all the way?

STUDENT: When we measured this, one of these was about a quarter of an inch.

ANTOINETTE VILLARIN: A quarter of an inch, okay. So then when you do 8.05, what's your unit? How did you convert it to inches?

STUDENT: Oh, uh.

ANTOINETTE VILLARIN: So if I am seeing this right -- hold on.

STUDENT: Then it would be um. Two inches and --

ANTOINETTE VILLARIN: Yeah. So this right here, you guys -- can we label this? This is 8.05 inches or 8.05 units. So can we label that units?

STUDENT: Not 8.05 inches.

ANTOINETTE VILLARIN: Yeah. So is it units? Do you guys agree that it -- okay, so let's label it units on the paper so that we have that.

STUDENT: I don't think I have space.

ANTOINETTE VILLARIN: Oh, you can do it underneath. So can you just write units underneath. Yeah. All right, and then how did you convert that so that you could actually measure it with a ruler? That was -- that's my question, is what'd you do? Ben?

STUDENT: Well, I divided that by 4 ’cause each unit was a fourth of an inch.

ANTOINETTE VILLARIN: Mm-hmm.

STUDENT: So then I used a ruler to point -- to find the point.

ANTOINETTE VILLARIN: Okay. So you guys converted this to inches and then once you got it to inches then you drew a ruler. Okay. So again, just I want to count how many of you did it this way where you actually used Pythagorean theorem, and then you halved -- okay one, two, three, four, five, six, seven, about seven of you guys went to -- okay. All right, good. Okay. All right, thank you, Grendel. Did anybody solve it a different way?

ANTOINETTE VILLARIN: Anyone solve it a different way? Okay Izzy, can you come up to the board and share?You can -- Yeah, you can use your paper. If you're not comfortable showing your work, I do have blank pages for you to look at, okay? All right, okay.

STUDENT: Um, so what I did was I found the distance from this point to this point in height, which was 18 little cube units, and then what I did is I found this point to this point in length, so from, um, here to here. And then once I -- and that was 8 units. And once I did that, I divided it by 2, um, to find the midpoint. And I checked because I did the two different, um, slope triangles, and it was 9 by 4 and 9 by 4, and it hit (-9, 0). And I did that for the rest of them.

ANTOINETTE VILLARIN: Okay, so if I rephrase what you're saying, your slope, you used to help you find the middle, and you knew that it went up 18 and over 8 to the right, and you used that to cut in half.

STUDENT: Mm-hmm. Yeah, and I cut it in half to cut 4 and 9.

ANTOINETTE VILLARIN: Okay, everyone turn and talk to your partner and tell your partner, how does this show you the midpoint? And why can she use slope to help her locate the midpoint, okay? Talk to each other. Why does slope help you find the middle?

STUDENT: I think she found the hypotenuses of both of the equal triangles, and then she found the midpoint of the line.

ANTOINETTE VILLARIN: … why using slope can help you find the middle, other than Izzy. Okay, Leia?

STUDENT: Because the slope triangles are always the same, they're always similar to each other if they're on the same line. So, if you dilate it by a factor of one-half, then it's gonna get you a point on the same line that is exactly a half closer to the original point than the other original point.

ANTOINETTE VILLARIN: Okay, nice. And I heard you say the word "dilate." So, what's technically happening to this line segment when you look at it? If you're finding the midpoint?

STUDENT: It’s dilated by one-half.

ANTOINETTE VILLARIN: It's getting dilated by one-half. So taking your slope triangle and cutting it in half could be very useful in helping you find the midpoint, okay? So different strategy, both are wonderful, and both are using different tools that you guys have, okay? So I am gonna ask, if you have a third way. Is there anyone that had a third way for doing it? Zoe? Okay Zoe, do you wanna use your paper or do you want me to put up a template that you can look at? Your paper? Okay, all right, let's do that. And then we're gonna talk about how we're gonna take your thinking and then justify it, okay, justify it so that you're explaining it to somebody that maybe is a non-geometry student, and I'll get to that once we're done here.

STUDENT: So my way doesn't involve much math, and people pointed out that it was stupid, but whatever.

ANTOINETTE VILLARIN: Okay, there's no math way that's stupid. Okay, go ahead Zoe.

STUDENT: So I just, so ...

STUDENT: So, each one of the little units is basically -- is exactly a fourth of an inch. So if you just measure the lines, you can divide that length by 2.

ANTOINETTE VILLARIN: Okay, so show us. Like, what did you, like, measure one?

STUDENT: So if you measure, like, this one it's like, 4 and a fourth, and if you divide that by 2, you get 2 and an eighth, basically.

ANTOINETTE VILLARIN: Aha.

STUDENT: So, yeah.

ANTOINETTE VILLARIN: And then you actually like, drew it in and then bubbled it in for a point? Okay how many of you did that? Just measured it and then [inaudible].

STUDENT: Yay, I'm unique.

STUDENT: No, you didn't.

STUDENT: I did both.

ANTOINETTE VILLARIN: Okay, well. I'm gonna tell you this. Okay, thank you. Leave your paper here, because I wanna show everybody a strategy that is very -- that I was thinking that you would -- I anticipated someone would come up with it, but no one came up with it, and it kind of goes off of what Zoe did, okay. What I've seen some students do in other classes, is -- or seen in other geometry classes, is they just folded in half, okay. So finding the midpoint, you just take your point D, and place it to point A, and fold it in half ...

STUDENT: That's cheating.

ANTOINETTE VILLARIN: Is that cheating?

STUDENT: No. [laughs]

ANTOINETTE VILLARIN: No, it's not cheating, okay. Are you -- okay. And when you line up -- It's hard to see, I should probably do it on something else, but when you line up the side lengths, you end up getting the middle.

STUDENT: You should fold it the other way.

ANTOINETTE VILLARIN: Yeah, I should fold it the other way. Thank you.

ANTOINETTE VILLARIN: I don't want to -- So anyway, you fold it halfway and you land on the same point that Zoe has, okay? Same points that you guys had, and that's another strategy. Is that any less of a strategy than Pythagorean theorem or using slope triangles? Of course not. Okay? So what I'd like you to do, okay, because we have -- I'm going to -- we have about seven more minutes, is I want to talk about justifying. Because our goal today, which I forgot to tell you at the beginning of class, is using coordinate geometry, but justifying our thinking through coordinate geometry, which I think you all did very well today. Okay? We didn't get to part two, but this is a part that I do want to talk about at least for part one. Because midpoint is a word that you haven't seen before.

Um, let me place these up here, okay? So what I'd like you to do is with your diagram -- because you're gonna turn all this in with your name on it -- is the following, okay? Justifying your work has a lot of parts to it. And we've talked about showing your thinking, drawing diagrams. But these are the things that I think are really good justification [inaudible]. You make a table and label diagram, which I see you all have. Like, how does your diagram represent the problem, okay? You show an understanding of how the elements are connected and related. Will a non-geometry student be able to look at, like, your work on slope triangles and understand what you're doing, or your slope on Pythagorean theorem and understand what you're doing? Okay? And how you communicate your thinking. How do you communicate it and convince others, okay?

So what I'd like you to do in the last five minutes, is using your strategy that you chose, not somebody else's strategy, is take your diagram, and on your Three Read handout, there's a space for you to justify. I'd like you to either write using numbers, pictures, or words, a convincing justification for how you found the midpoint. Okay? Now, if you have a hard time starting it, you can use this sentence frame. "I think the midpoints are," "I think --" blank, and then tell me why. Okay? Can we spend the next five minutes working on that, so that we can turn this in? Okay.

If you didn't finish finding the midpoints, that's okay. Just work on a justification for what your strategy is, and how you know that you located the midpoint, okay? So Monday when I see you, we'll finish this, and then continue on to part two, because today we didn't get to part two in today's class.

All right, I'll give everybody two more minutes, and then I'm gonna tell you how you're gonna turn this in. And then before you leave, I'm gonna have you check in really quickly with your partner about something that you either noticed, something that you will work on on Monday, or something that you finished doing today, okay? And you won't have to write that down, we'll just share with our neighbor before you leave.

STUDENT: How do you write it? Explicit formula for Fibonacci's.

STUDENT: I don't know.

STUDENT: Wait, explicit?

STUDENT: Yeah. Fibonacci's. It's where it's 1, 2, 3, 5, 8, 11 --

STUDENT: No, no, no, 12.

STUDENT: No, it's 13.

STUDENT: Yeah, 13. 13, 21.

STUDENT: 34.

STUDENT: So basically -- isn't that basically just like y = mx + b?

STUDENT: What? No.

STUDENT: It kind of is, because it's just --

STUDENT: No, it's a previous [inaudible]

ANTOINETTE VILLARIN: All right. If you're writing, continue to write, but listen carefully for those of you that are done. I put a stapler in your tray. You're going to keep the purple paper, because we're gonna do part two on Monday. I'd like you to staple the white handout on top of your graph paper, and then just place it in the tray. And then you keep the purple paper, and the ruler goes back in the tray as well.

And then -- one second, before you guys start moving -- and the trays are back here, you can just place them in these trays in your desks, okay -- is, before you leave, just as a quick check-in with your neighbor, because I know you have to leave very soon, is tell your partner either one thing you noticed today -- Grendel and Chenrui, shh. One thing you noticed, or one thing that you're still working on for Monday, or one thing that you finished today that you kind of now understand. Okay? So turn and talk to your partner and tell your partner one of these things.

STUDENT: I noticed that the slope [inaudible] from the middle part of the line.

STUDENT: Yeah, that's what I noticed too.

STUDENT: Because, like, if you have a square, you can dilate it by one-half and then rotate it, and then it'll find the midpoint.

STUDENT: Or you could just draw the square and [inaudible]

STUDENT: Or you can reflect it. But in order to reflect it, you already have to know the midpoints.

STUDENT: You could just rotate the whole shape by 90 degrees.

STUDENT: But it doesn't work if it's -- that doesn't work if the side lengths are already the same. I tested it.

CECILIO DIMAS: Tell us a little bit more about where you're at in your units of study and how this lesson that we just finished observing fits into your, um, your scope and sequence, or how you're outlining big ideas in you school year for this course.

ANTOINETTE VILLARIN: Okay, okay. So I'm, um, I'm new to Borel. This is my first year here. And, um, currently we're working on triangles in geometry and trigonometry and special right triangles. And since I started, I've noticed that this group, um, though they would be considered what they say are advanced learners, they, they really struggle with justification and proving their work. They're very eager to, like, solve a problem and want to move on to the next task without really sharing what they're doing, so it's something I've been working on since, I feel like, the first week when I noticed it with this group.

We talk constantly about, like, what it means to be a mathematician, getting the correct answer but also being able to communicate your thinking, being able to, um, justify how you got your work and share with somebody who's not a math student, because oftentimes when they would show work, it would be all over the place and I would tell them I understood it but somebody else didn't. So, justification has been something I've been really working on to make sure that they understand that getting the right answer is one part of math but also explaining it and making sure that they communicate that is like a whole other part that I really want to develop.

CECILIO DIMAS: So it sounds like you have been framing a lot of the discourse and -- and collaboration around math practice three, of student constructing an argument but the argument not just being showing your work or having an answer, but really being about the justification connected to the context of the story that they're, or the problem that they're engaging in.

ANTOINETTE VILLARIN: Yes, definitely. And a lot of times they'll tell me like, "I did show it, I did have my equation here," and I'm like, "I -- well, I don't understand where that number came from, and you want to make sure that you add labels so that it's clear for what we've been saying is a non-geometry student." So I'd say in the past month we've been really working on, like, justifying, and they've been saying, "Yes, Ms. Villarin, we want you to -- you want us to justify." So, I'm really pushing them and also teaching them to learn how to talk to each other about how they do that because they're just, they're students that just want to, like, move on, like, "Okay, Ms. Villarin, I'm done with this, what do I do next?"

So, teaching them to slow down and take turns, like, those are all things that I'm trying to work on. And I felt like this task, which is something that we maybe haven't been doing necessarily in the unit that we're working on, um, was a good one because it introduced coordinate geometry, which they've had some exposure with since they're taking algebra currently, but they also, um, don't know what midpoint is. I've never told them what midpoint is. So, I felt like it was a fun problem to actually see how they would approach it not really knowing even the vocabulary of what it meant.

CECILIO DIMAS: Can you tell us a little bit more about the rationale behind picking the Three Reads routine as a way to launch the problem and, um, the experience that students have had and that you've had with this class with using the Three Reads routine?

ANTOINETTE VILLARIN: Yeah, so I, um -- Oftentimes when the prompt is really long, and with this Whitebeard treasure it was a long prompt, um, this class is really motivated with questions that come up on their own. So with Three Reads, we've done it at least three times already this year. This would be the third time.

But the first time we did it, they were really excited because they were having to answer their own questions. And when I initially had done the Three Read with them, they had tons of questions. They probably had ten of them. And I said, "Okay, pick one that you want and start to explore it." And I feel like for, for this class, they're really motivated by answering their own questions. They have a lot of like "I wonders" and "I notices," so when I don't give them the prompt, I think it was exciting for them.

The second time, we did the same thing. I had them share with me all their math questions, which they were excited about, but then I honed in on one and I said, "Okay, I want everyone to solve this one particular problem and then when you're done you can start to look at some of the other ones," and they did get to that, which was, which was nice. This was the first time that we did it and, um, I wrote down the questions and I hope to get back to it again when I get to part two but I, um, I actually gave them a prompt that I wanted to. And I think in this case it was because there just wasn't enough information in the Three Read. So it was just a way to kind of access the problem. I wanted students that maybe, like, get overwhelmed by the text, um, or don't know where to start to at least have a starting point, so hearing it three times I think is really helpful. It's like a way of kind of anchoring the problem, um, so that once you get started, you can jump into it.

CECILIO DIMAS: Yeah, because it really was um -- I know that we were, when we've talked about the Three Reads routine before and earlier, earlier this week when we were, um, working with the students with the routine, there was a concern about time.

ANTOINETTE VILLARIN: Yeah.

CECILIO DIMAS: And so, um, I thought that it was really -- it had a nice flow, and I think that there were -- the students were, from what I observed, um, were able to really understand the context. And, um, and walking around, what were some of the observations that you made in their work, um, through the Three Reads process?

ANTOINETTE VILLARIN: Well, I was worried because I knew this prompt didn't have enough information, and I was waiting for them to say that. And I think [inaudible] had -- was like a perfect segue into noticing that they weren't -- that they were actually writing questions, like, "What are the dimensions of the fencing? What is the area between the two fences?" It seemed like area was a big thing that popped up, and I think that's just because it's something that we've been doing with triangles. Um, and then also, a lot of assumptions like assuming that the

dimensions of this shape. So I love that they were adding parameters to that because we have been talking in the past few days about questions that maybe aren't given to you in the prompt but that you have to assume. So I loved when [inaudible] said, "Well, assuming that they were 12 by 12 feet, how -- like what was the difference in the area?" I like that they're starting to bring in some things that they know are missing and are leading to further questions. Yeah.

CECILIO DIMAS: Was there anything that surprised you when you were looking at their work, or that you were really excited to see as they were engaging in the second and third read?

ANTOINETTE VILLARIN: The second and third read? I was excited to see, um, like, I think adding the conditions. Like seeing that they were connecting to things that they've already seen before, like area. Um, some of them had questions like, "What would be the angle?" because we've been looking at trigonometry and looking at the angle, so I love that they're starting to, like, pull these skills that they've been learning over the past couple of years and just kind of bringing it together to see how they might approach the problem.

CECILIO DIMAS: Um, can you also tell us a little bit more about the, uh … The original lesson had two parts.

ANTOINETTE VILLARIN: Yes. [laughs]

CECILIO DIMAS: And, um, can you talk to us about how you chunked the problem into two different parts, and the rationale behind that?

ANTOINETTE VILLARIN: Okay. Well, pacing and time's always been an issue for me. Like I even just ran out of, ran out of time today, um, in terms of like the ending, and how I wanted the students to check in. But I just knew that we hadn't talked about midpoint yet. Um, they don't, they don't know the midpoint formula. Like we haven't gotten that to that in our curriculum. Um, but I do know that they know a lot about slope, and that they've graphed points on a line and they know what a quadrilateral is because we've talked about properties of quadrilaterals, but they, um, they haven't seen midpoint.

And so, knowing that, I knew that I couldn't do both at once, where one part was looking at midpoint, and then, I think, the second half of the task, problem three and four, were looking at special quadrilaterals. I had to piece it separately, and I knew midpoint was going to take the most. And I don't know if it was captured, but I, as I was walking around, while the students -- when I forced them, and I said, "You need to put your pencil down and make sure that you share with each other what, um, what the question is asking you and how you're starting it." I did hear a student or two say, "It's asking for midpoint. Like, what is midpoint?" And I love that! That was like my favorite thing, because I felt like it gave them a reason to start to learn what midpoint was very informally.

CECILIO DIMAS: Mm-hmm. Um, as you think about Monday morning ..,

ANTOINETTE VILLARIN: Uh-huh.

CECILIO DIMAS: And the next lesson, what are some things that are, um, surfacing for you as you think about how you can create a space to hold cognitive demand and keep rigor high, um, create a space where the students will continue to have access to the ideas, not just their ideas at their table, but also what they're able to hear from their classmates, um, and then continue to gather some formative assessments? As you think about Monday's lesson, what are some things that are surfacing for you?

ANTOINETTE VILLARIN: So, I feel like I, um, ended it at a point that I thought would be the middle of my lesson, which was, like, talking about justification -- which I had forgotten to announce at the beginning, but I'm glad I was able to squeeze it in at the end -- that I might actually take their work and start to pair them up. Um, I was thinking originally of having them be in same-groups, um, like everybody who solved it the same way.

But now that I've heard the two different ways that students have solved it, and it seemed almost, not half and half, but about, approximately half, that if I pair them up with somebody else

that has solved it differently, to switch justifications and read each other's, and see how convincing it is to somebody that solved it a different way, I feel like that's going to be where my starting point is. Um, I would like to list, maybe, all the different strategies they had on the board and then see if maybe somebody had any extra ones that they had noticed.

Because, at the end of class, there was one student that said, "Well, Ms. Villarin, I found that if they were congruent, um, if the quadrilateral was congruent, there was another way to find it." And I said, "Can you save that idea for Monday?" So, I feel like I can add to the list and then also strategically pair them up so that they're showing each other how convincing their justifications are to somebody that did it completely different.

CECILIO DIMAS: Yeah, I know that we've talked about the routine of convince self, friend, and skeptic, and it sounds like the pairing up of students who have different strategies, like, that's gonna be possibly either a friendly conversation or maybe a skeptic conversation for them to engage in. So what are some of the supports that you might put in place as you think about pairing students up to have those conversations?

ANTOINETTE VILLARIN: I'll have sentence frames, like "I agree," or "I disagree." I think a lot of times some of the students in this class, maybe because it's a morning class or they're not used to it, but question each other, what types of questions to ask each other, like "How did you get that problem? Where did this number come from?" so I feel like I'm gonna need sentence frames to encourage them to have kind of a constructive dialogue versus, like, "Okay, I get your answer," but maybe asking questions for going deeper into it. So, those are some things.

CECILIO DIMAS: So, taking a step away from this lesson and talking a little bit more about the change from moving schools. And so, as I came into your classroom and worked with you earlier this week, I noticed that there are some staples that you brought with you. And so I think it'd be interesting to talk about some of the things that you brought with you and why you brought those posters or those ideas with you.

ANTOINETTE VILLARIN: Well, definitely the posters like "We celebrate mistakes," and I loved today when Grendel felt like he made a mistake and he was doing Pythagorean theorem, he said, "Oh well, no, I made a mistake," and I loved that it was in front of the class and we were able to work through it. So this poster right here, I don't know if you can see it, where it says "We celebrate mistakes as opportunities to learn," "Do you mean, I don't get it yet." Other posters, like, in math class that I got from SVMI was "We will share and justify our solutions," we'll explain our thinking, make sense of others, so there's a poster up there. So, lots of just kind of the culture of the classroom that I want to create, I've brought -- I'm hoping to bring with me. But being at a new school, it's different at every new school, so, like, for me coming into a geometry class, I was really excited to see how deep they were gonna justify their work and I noticed that we were lacking in that, so I just feel like this is the year where I kind of wanna build it up, with this group.

CECILIO DIMAS: And I think that the distinction between showing your work and a justification is something that you've continued to engage with your students and support them in working through, and computing and calculating is a part of it, but then how does it relate back to the story in the context. So I think that having those visual cues for yourself but also for the students to know that you're not picking on them by asking them to justify or explain deeply, it's actually what we want them to do as mathematicians.

ANTOINETTE VILLARIN: Yes, yeah, and I've noticed that too, like a lot of times I'll go around, they'll have calculations on just an activity that we did earlier in the week, and I had asked one student, "Where did you get that equation, and what does that number represent?" And then she told me, and I'm like, "Okay, perfect, why don't you label it. Even if you don't write a sentence, label that so it's connected to, like, the right triangle that we were looking at." So

really just pushing them to really think deeply and communicate it clearly to a non-geometry student.

CECILIO DIMAS: Another question I had that might enter the realm of being sensitive would be -- well, another question I had in observing what might feel a little sensitive is, when Zoe was sharing, she made some comments about her strategy, and so I'm wondering if you could talk about that a little bit.

ANTOINETTE VILLARIN: Yeah, and I think she said at the end … well, I saw her hand hesitate, and I said, "Well, why don't you come up here and share it," and I think she called it stupid. And I said no, we -- and I wish I had honed in on that a little bit more, like in hindsight when you think about the lesson -- but I told her, "No strategy is stupid, I'd like you to share." And it was like a perfect segue because as I was walking around and seeing students solve it, I thought one of the strategies would be that students would, like, fold their paper in half, because we had started with some constructions at the beginning of the year, and looking at how shapes like dilate and form, so we had folded isosceles triangles in half and seen what properties. So I was thinking that would be a strategy that they would use, and nobody did it. So when she did it, I mean, I felt like it was a perfect segue into showing her that there's even simple ways of folding a paper, and I mean, she got the correct answer when I looked at where her midpoint was, so it worked. And I -- that'll be one that when I make my list of strategies when they come in for part two, that these are things that I saw you do on Friday, that'll be on there. And I loved when I said, "Is that any less than anybody's strategy?" and Logan's like, "Of course not," [laughs] so it was perfect. And just kind of creating that space where there's different ways to solve it, because I do have abilities also within this kind of advanced group.

CECILIO DIMAS: And when we think about the importance of building classroom culture where students can share their thinking, their "on their way" thinking, their current ideas as to way to have like a sounding board, and to bounce ideas off of their classmates, I think that we can see that in your class. And I think it's really important to highlight that. And I also observed you talking a lot with your students, prompting them with turn-and-talk with purpose and product, and some of the other routines that you have in place that didn't need explanation, like you announced what the expectations were and students engaged in it.

CECILIO DIMAS: As you think about, like, your top three classroom management routines that you use for building classroom and sustaining classroom culture, what would you say some of them might be?

ANTOINETTE VILLARIN: Definitely the turn-and-talk. Like, this class loves to talk, so it was actually really surprising when I told them, "Okay, start part one and I'd like you to start," and everyone was quietly working. And for me, that was uncomfortable because I'm used to them, like, checking in, but they were drawing it. But I think it's just because of the task. You were graphing points and it was just kind of a quiet activity. So really forcing them to like, "Okay, you need to put your pencil down and I really need you to share with your partner," doing that. So, the turn-and-talk is important, I think. Adding the purpose and then also a product of like, what I want you to do when you talk, I think makes it very explicit for them.

One of the other things is making sure that you're listening when others are speaking. I find that very important, especially in a class where they love talking over each other. So, like, when somebody's up here sharing, that everybody's listening and attentive. Asking questions. And that, I think about -- like, I mean, when you do a lesson and you think: “In hindsight, I should've asked if anybody could rephrase like what students were doing as they got to the board, or what -- what questions might you have for somebody,” but again, pacing for me is always a struggle. And then I think about kind of the talk moves that I can have them do to kind of rephrase what they're hearing. I wish I had done that a little more in it. But those are some too. And then the Three Reads is one that I really love, especially with -- with the tasks that we have that are very text-heavy, and um, are just like interesting problems to do. Yeah.

CECILIO DIMAS: I also think the modification you made by creating the document sheet …

ANTOINETTE VILLARIN: Oh, yes.

CECILIO DIMAS: … extra document for capturing their ideas along the way, with the Three Reads protocol. But also having a space with outlines for them to record their ideas at the very end of the lesson. I think that that was a really powerful way for them to make their thinking and learning visible to themselves and also to others.

ANTOINETTE VILLARIN: And to others. Yeah, and that with the -- I went back and forth because, oftentimes, I'll just give them a piece, a blank piece of paper. Other times, I'll give them something with a little bit more structure, but I did wanna record all their Three Read questions, because I knew I wasn't gonna have time to capture all of it. So, it was just a way for me to later see what were some of the other questions that students came up with, because when we do finish this task, I hope to put some of those questions up that I didn't get others to share, and then maybe explore those if there's time, kind of thing. But it's all with the justification goal that we had for the class. Yeah.

CECILIO DIMAS: So, if you … Um, in conclusion, if you were to -- if we were able to travel in time, back in time …

ANTOINETTE VILLARIN: [laughs]

CECILIO DIMAS: … and you were to talk to yourself two hours ago …

ANTOINETTE VILLARIN: Uh-huh?

CECILIO DIMAS: Um, what would be some things that you would tell yourself, um …

ANTOINETTE VILLARIN: The experience?

CECILIO DIMAS: About the experience?

ANTOINETTE VILLARIN: I'd say like, as always, every day, that, be ready for surprises and be ready for the anticipation. I think some of the strategies -- like, one of the strategies that the students came up with I didn't even think about. I was making a mental note, just for myself, like, I think, "They'll use the slope, I think some students will measure and cut in half," but for them to actually find the length using Pythagorean theorem and then convert it -- I loved that they did that, but that wasn't something I was ready for. So, I think just be flexible …

CECILIO DIMAS: Uh-huh.

ANTOINETTE VILLARIN: Be ready, and be okay with stopping in the middle, because I did have visions of at least ending the class with passing out, um, part two, and having them explore part two, but we didn't even get to that, um, kind of thing. And be okay with maybe not getting to everything, would be my advice from two hours ago. [laughs]

CECILIO DIMAS: [laughs] I think you did a wonderful job of anticipating, um, in that there are -- and navigating that flexibility.

ANTOINETTE VILLARIN: Uh-huh.

CECILIO DIMAS: And also, with going at the speed of learning.

ANTOINETTE VILLARIN: Uh-huh.

CECILIO DIMAS: I know that’s something David Foster has talked about --

ANTOINETTE VILLARIN: Yeah.

CECILIO DIMAS: And others have talked about, like going at the speed of learning. And so, you were really honoring the pace of where they were at and you -- you still pushed them to think individually, to collaborate with others, to do whole-group debriefs, so there are many great teacher moves that were -- that you executed throughout the lesson.

ANTOINETTE VILLARIN: [laughs]

CECILIO DIMAS: So, we're very thankful --

ANTOINETTE VILLARIN: Thank you!

CECILIO DIMAS: -- that you opened up your classroom and practiced with us.

ANTOINETTE VILLARIN: Thank you!

CECILIO DIMAS: And we look forward to continued collaboration.

ANTOINETTE VILLARIN: Thank you, Cecilio. [laughs]

CECILIO DIMAS: Thank you.