

PAM BROUSSEAU: So once again, what was your goal for this lesson?

MELISSA NIX: Well, I knew going ... When I first thought I was going to teach the lesson, I was hoping that they would be able to see um, the relationship of multiplying two polynomials to get a -- a total product. And then being able to also look at a product and get the two factors. But I knew going into that there was going to be some um, stretch for the students, that -- that we weren't quite ready to do necessarily this level yet.

PAM BROUSSEAU: Mm-hmm. [affirmative]

MELISSA NIX: Um, but I was still willing to because I knew that they had enough that I would get those good grit and it ... you know, maybe this is exactly the right timing for this lesson, when it is a little bit like, pushing that envelope and making that brain stretch.

PAM BROUSSEAU: Mm-hmm.

MELISSA NIX: So my hope was that they could see the relationship of the dimensions of a rectangle to get the total product of an area, and to recognize then that the product is made up of the two factors, which in this case happened to be polynomials, and that you could then take your product and, as we said, un-multiply, or divide them out to get your products -- to get your factors, or the dimensions.

PAM BROUSSEAU: So -- go ahead.

MELISSA NIX: That was my goal, and -- and ...

PAM BROUSSEAU: So how close to--

MELISSA NIX: We're on -- we're on that -- we're on that trajectory. We're gonna get there. And I bet tomorrow with another chunk of focus energy and conversation and more sharing of student work and strategies and, you know, I think we're gonna get to a piece where we can have that whole grid filled out and really, you know, walk away with like, some deeper understanding about the relationship of polynomials, how they multiply together.

PAM BROUSSEAU: So thinking of your goal, thinking of where they are on the trajectory for the goal.

MELISSA NIX: Mm-hmm.

PAM BROUSSEAU: Thinking of um, your teacher moves.

MELISSA NIX: Mm-hmm.

PAM BROUSSEAU: Thinking of what happened today, their student learning ... So what are you going to take away from -- take away from today that's going to help you as you move on?

MELISSA NIX: Um, I always want to highlight ... Or not highlight, but figure out how to support them with their misconceptions, and really make sure that they can make sense of the larger

mathematical ideas, so that idea that the dimensions are additive. So you know, that it's an x plus x , or it's an ... in the case of the rectangle, that it was a z plus an 8 . Because as they label it, they're just labeling it as z and 8 and they don't put any sort of operations there. And so when that then transfers to that abstract of like, multiplying it using the distributive property, they get a little bit lost in that confusion.

But even bigger picture, like I want them to be able to multiply polynomials ...

PAM BROUSSEAU: Mm-hmm.

MELISSA NIX: ... and I want them to be able to multiply you know, a binomial times a binomial and then to see that the area relationship ... But I -- I love that this had some context to it first, that it wasn't me just going old school, showing them how to FOIL ...

PAM BROUSSEAU: Mm-hmm.

MELISSA NIX: ... and then write down the steps and do it. It was much more of an abstract, get a little deeper with it. Um, and planning for that forward movement, I really want to make sure that they can gain some agency and ownership of this math so that when it comes time to actually convince me that their answer is right, that they're gonna be able to convince me, either like by segmenting out those areas with like ... Okay, this is representing z , and this is representing 3 , and this is now my 1 and a half, or whatever it is, so that they can kind of make some real sense of what it is they're doing.

And they're not there yet. But I think if we could kind of -- if I can get them to visually see how it's all related, that these are individual units that are making this whole area, then they'll see that this dimension is additive, and that when you're multiplying, you're getting that x squared in that whole area.

So that's where I want to take them, so that when they do start multiplying out, they don't just get lost in the rote steps. That it makes sense to them that an x times an x is an x squared. And that when they combine terms later on, that they know that's like an x next to an x on the side of my dimensions, and that's just a $2x$.

But to really kind of deepen those frequent misunderstandings of like, "Oh, two x 's? That's x squared. Or is that $2x$?" So I think as I move forward, I'll have them go back and revisit that work and make sure that they can own that enough that they could prove it to me. So maybe work with some visuals of how that would be compartmentalized or segmented off to show what that would actually look like as an area. Um, so that we can then move on to doing the multiplication.

PAM BROUSSEAU: Well, it's very evident that you have thought very deeply about this ...

MELISSA NIX: I do.

PAM BROUSSEAU: ... and you really care for your students.

MELISSA NIX: Absolutely.

PAM BROUSSEAU: It was a pleasure to be in the classroom with you.

MELISSA NIX: I'm really glad you were here.

PAM BROUSSEAU: Well, thank you. Is there anything else that you wanted to talk about, reflect on?

MELISSA NIX: No. It's so funny, no, the -- the problem doesn't stop for me either. So I'm gonna go home and ... [Laughs.]

PAM BROUSSEAU: Exactly. [Laughs.]

MELISSA NIX: I'm hoping my students go home and divide out that, you know, 26, and divide out the 6 and a half. And I'm gonna keep thinking it through, like any good lesson, and you know, kind of figure out ... I'll look at, you know, their exit tickets and see where they're at right now, and then I might give them that exit ticket again, you know, tomorrow or next week to see where their -- where their thinking has grown.

Because we're not done yet. I mean, we didn't get a chance to finish the whole lesson today, and I'm looking forward to seeing what they do with it tomorrow. And I know that their thinking's gonna be even more sophisticated and developed and enhanced, or whatever word you want to say, um, tomorrow. So yeah, I'm one of the kids. I'm not gonna -- I don't have anything more to say, but I'm just gonna keep processing it through.

PAM BROUSSEAU: Well thank you for your time, and I'm excited to see what happens next.

MELISSA NIX: Yeah.

PAM BROUSSEAU: So give me a call or email me and tell me how it goes.

MELISSA NIX: I will.

PAM BROUSSEAU: All right.

MELISSA NIX: I'll screenshot you their work.

PAM BROUSSEAU: Thank you so much.

MELISSA NIX: My pleasure, thank you.