

Faculty Debrief Part E:

PHIL TUCHER: Um, so we've talked a little bit about what closure could've been. It could've been a written reflection in their notebooks about these or it could've been a –

BARBARA SHREVE: A public conversation.

PHIL TUCHER: A conversation about the "Who's Right?" exercise. It could've been a written kind of an exit ticket type of deal. "Same problem, you've seen this before. This is not a memory test, this is a now that you've done other...what do you think now?"

BARBARA SHREVE: Right.

PHIL TUCHER: You can even have kids "I used to think this, now I think" or "This is how I thought about it before class, now I know that" as a way to structure that type of reflection. Um, generalization statements? Do you feel like we've pulled out some samples of that?

BARBARA SHREVE: Yeah, I do.

PHIL TUCHER: An aspect of that that connects back to the "Who's Right?" conversation. Let's go to that question. The "Who's Right?" conversation that didn't go the way you anticipated. You wondered whether or not it had the access that kids needed, you wondered if it was the right start, what information did they need, and was there a way to bring in other representation. Talk a little about what you anticipated and what happened instead.

BARBARA SHREVE: Um, I hoped that as they started looking at those, they would be able to give each other more reasons about where they – like what would work and why. So this idea that if this is a quadratic formula problem, "oh, we're doing that because look, it has an x equals in it." And that level of really checking out what was going on or where it was headed, I didn't hear as much. Um, or "when we start with a quadratic equation, how do we end it? Set it equal to zero." "What's our next step? How do we solve an x^2 problem?" So I guess maybe I, um, could've activated some of that by asking to think about their own first step before giving them three choices, so that they'd made a little bit more sense of what this language was in the initial problem. Um, this is where – this kind of question is where as a class we've worked most recently, but also I think where they've had a lot of questions coming up for themselves. And so they're very confident with their factoring and I almost wonder if I flipped the two, I felt like the second conversation they were able to dig into more quickly and have more ideas around it. So in that second conversation, I wonder if that's simply because they had gotten familiar with the structure again, which we hadn't used the "Who's Right?" structure in quite some time, or if it was actually that the factoring was somehow easier for them to make sense of, and if starting with that, the way they talked about this would've changed. They talked about the "solve the equation" problem.

PHIL TUCHER: Developmentally in the last weeks, this was first.

BARBARA SHREVE: Mm-hmm.

PHIL TUCHER: And so, maybe you're right, maybe this was more sort of comfortable for them. And switching them up as a possibility.

BARBARA SHREVE: Putting this first for me, I was thinking that they tend to talk better about stuff they perceive as harder. So in this particular class, if they think, "Oh, this isn't – it's not worth talking about," then it gets us off to a very slow start. So I was thinking, give them something a little bit weirder first and then move back to their comfort zone to model "This is another way to look at it and think about it."

PHIL TUCHER: Wow! And that actually happened, didn't it? Because this is where they got stuck and then once you're ready to move on, you said "I'm going to do this one a little bit quicker," and sure enough, they were more comfortable with it. So there's reasons to do it that way. Just a clarifying question. You said they may have had questions about what the language means. Where? Remember that? You just now said...you said they may have questions around the language?

BARBARA SHREVE: Well, they just didn't look...I don't know how many of them read and internalized what the question itself was. So the problem that these three students were arguing about was "solve this equation for x." And I don't know, like given at the end I said, "Oh, well, you're finding the x-intercepts." And they were really clear that we were finding x-intercepts. It seemed like they'd forgotten what the original prompt was. And as soon as we looked back there, my sense is more kids were like saying, "Oh no, it's just this one."

PHIL TUCHER: I want to talk about language. I have a suggestion that you might consider. I think it would also help with, um – you've named that this is conceptually slightly more complicated for them. I wonder what would happen if you have something of a "name everything that's on the page" level of the exercise. So before your comment is they didn't give the kinds of reasons or you wanted them to give each other more reasons. And I'm suggesting that before they can give reasons for anything, they need to know what they're reasoning about, and have names for what they're reasoning about. So what are the things on this page that we can name? Uh, an equation.

BARBARA SHREVE: We've got an equation, we've got a generic rectangle, and a quadratic formula.

PHIL TUCHER: I'm not going to write them down, let's just brainstorm them.

BARBARA SHREVE: Yeah.

PHIL TUCHER: You've got a solving.

BARBARA SHREVE: Mm-hmm. We have balancing an equation or doing the same thing to both sides.

PHIL TUCHER: Uh-huh. Um, you said quadratic formula already, um, with the radical sign or square root sign.

BARBARA SHREVE: They might use the term coefficients.

PHIL TUCHER: Coefficients. You have your a, your b, your c, um...

BARBARA SHREVE: Or factoring here.

PHIL TUCHER: So what I'm suggesting is, if kids had names for everything that was in front of them and I think naming things is a way to engage them, kind of at that first level they could sort of identify and have a name to associate with a symbol on the page, then they might be able to say, "Those are the symbols that I know or those are the ones that I don't know." Or they might be able to say, "Oh, those are the things that I use when..." Or they might be able to say, "Katie is doing this because..." And they might then be able to have access into the reasoning kind of statements that you're wondering about. Does that make sense?

BARBARA SHREVE: Yeah. I'm trying to picture whether that's something that gets built in this activity or that I needed to lay ground work for over time. I think maybe it's both.

PHIL TUCHER: Maybe both. Over time, what does that look like to you?

BARBARA SHREVE: A lot of the way the curriculum develops, the students are doing lots of things with their constructed language around it or language that's no different math vocabulary. So this generic rectangle is finding a length and width, and an area or a product, but not always factor some products. Um, just as an example like that, language tends to come in later or like now, at the end. And so it's perhaps previewing that language and using it more interchangeably earlier in the unit, particularly in this additional class to get students more in different access where they may not have those at the tip of their tongue in the same way because they're concentrating their attention in other places.

PHIL TUCHER: You've heard me mention word walls before. Word banks, words of the day. Um, you could use the formal language that you're referring to and have that list there on the wall, on the white board, on an overhead. Um, especially on the wall or the white board, to have it there as a bank of words that they might want to name drop, and then the exercise if you felt there was time -- the exercise real time for them is "You each have a paper in front of you, here it is on the overhead. Name as many things that you see on this paper as you can. The very thing that we just did." And I'm guessing that when they name, they'll at times go to their transitional vocabulary, their own sort of "Oh yeah, we did this yesterday in math class." Um, and then you can certain times connect it to the formal language and certain times just embrace that's the transitional language that they're comfortable with at the time. But those -- using a combination of "here's the formal language that we're developing over time" with the specifics of "everyone in the room needs to engage with these symbols on the page, here's your" -- you can even set it up as the pair activity. Remember you said, "You need to be able to see this, you and your partner need to be able to see this paper." You could say, "Take 30 seconds and come up for names for as many things on this paper as you can." And you could do a whip around, some type of just "As fast as we can, let's get words out." I think that level of words out, this "let's get some words on our tongues," gets a few kids just to be engaged with the page at that level. Then when you say, "So who's right?" not only are they hooked by the problem but they have the words to begin to say, "This is why I think it's a, b, or c." So that was one thing you might work on, is the vocabulary. And I loved the way you've identified some of it as transitional and some of it as trying to use the formal vocabulary.