Leaders in Mathematical Thinking
Connie Quadrini - Embrace the Messiness

>> So I would say, first of all, it's always a great idea to work collaboratively. And I think part of it is coming in with kind of an open mind set. I mean, we talked about growth mind set, but what does that really mean? It means that we are constantly learning and growing for the sake of the children we teach. So when we come in with that, knowing that sometimes things will be messy, or we won't understand that, like, that's hard for us, because as educators, our job is to help children learn. Our job as leaders is to help teachers learn. So when we come in with that kind of stance, that we're trying to work through that messiness, it's always with a purpose. It's trying to ultimately support children in the classroom, to reach their potential. It's working on it together, and it's being okay that sometimes we don't know. And at times, that means we may want to draw in on somebody who can help support us. It might be a facilitator, it might be a resource. Maybe we need to go to our professional learning library and look at a resource that will support in that kind of breaking through the messiness. Sometimes it's about getting in the classroom and trying some tasks with kids, and coming out and talking about it. And then if it's not quite working as we'd hoped, then we try something different we go back in. So I would say a few things; firstly, it's about being able to work collaboratively. Secondly, I would say, is to know when to draw on expertise or support. That's not always human support, although it can be. It can be a facilitator. Sometimes that's about professional learning resources, sometimes that's about engaging in a webinar for learning. But it's kind of being able to work as a group to figure out, when do we need that support? And when are we kind of working through together and making breakthroughs? I think that's one of the most important things as a group. As you're working through and you're pushing out of your area of comfort, or where you typically work, as you move out, it should be new learning. When you feel like -- you know, even for myself, when I feel like I'm kind of cycling in the same place and I need to be looking for who are those people? What are those resources that are going to help me move out, to that next layer, and keep working through those messy areas? I think those are the things that are ultimately really the supports that will help educators, help all of us, no matter what our role is. One thing that stands out for me, related to some of those challenges, and thinking about a group that I worked with, and we really started to dig in deeply into the content, in fact, we were talking about proportional reasoning, and more specifically ratio and rate, and some of the similarities and differences. One of the things that we did was, we took a problem, it happened to be the caterpillar and leaves task, some people know that task. And we actually -- teachers, the group solved it in a number of different ways. Part of what I did was to share some of those solutions, but to bring attention to the mathematical thinking that was evident within the solution, what was written and what the teacher talked about in light of that solution, and trying to name that mathematical thinking. And I would say that that seemed to be both eye-opening for the teachers, but also almost felt like a bit of a struggle, because they were impacted by this naming of the math and being able to recognize the mathematics and the concepts embedded within solutions. But the question that

emerged from that after was, well, how do we know how to do that for all the different other topics of mathematics? And I think part of that is this constant kind of frame of mind of being able to study the math together. You know, I happen to be a facilitator who might be working with a group. There'll be a time and a place for me to be there, and get them thinking deeply and have them thinking diversely about the content, the concepts, different solutions related to a particular problem. But we're trying to develop a culture where teachers do that themselves, that they come together and say, "Wow, we're studying this topic. What are the kinds of important things that we need to know about that?" Let's work through the task and let's come up with some diverse solutions. How would we name that, to help put math language or terminology to the solution that a student would be describing? It's that practice and that work that at first may seem like a challenge for teachers, but becomes the opportunity for them to continue their collaborative learning. And I would say in places where I've certainly facilitated, where we've had time to go really deep, like over the course of a year or two years, and over a number of days, like five to six days every school year, that culture is being developed. And really, it's not about a facilitator. There's a saying that we want to work ourselves out of a job. And really, good facilitation, that's where it gets to, where schools and staffs and groups get empowered, that they've gone deep enough into a concept and thought deeply about it, and thought about the relationships and the connections across solutions, and how to name that mathematics to support children and students. But then they, themselves, want to continue to investigate that for other concepts. So if they've done it within number sense and in particular fractions, they want to see what that looks like for measurement. And they want to see what that looks like for geometry. So I think that's part of what we want. We can turn a challenge into an opportunity. So I'd say one of the things I think that's really significant around facilitating professional learning in mathematics is this ability to embrace the messiness. So what happens is, that sometimes when educators are working through some of the math concepts, it gets messy. It's not just a one way to solve the problem. And there's lots of different ways. So sometimes that's overwhelming. It's overwhelming for students, it can be overwhelming for even teachers, when they're trying to develop understanding and flexibility around those ideas, and even for us as facilitators. It's trying to be able to not only think about diverse ways of thinking about a solution to a problem, but then how those ways interconnect, and how will it help deepen our understanding as educators, and then how will that help students in terms of them becoming flexible thinkers? So I think it's part of facilitation is really about embracing the messiness. You know, sometimes not being sure. Once you step out of your comfort zone, things can get messy. But it's almost having the patience and the trust, and good facilitation skills, that will help support a group through that. I'll give a quick example. So I was working with a group, and they were really thinking hard about this idea of ratio and rate. How were they similar? How were they different? Each time we came together, we kind of cycled deeper and deeper into that. And part of my role as the facilitator was thinking about what kinds of learning experiences, tasks can I bring to them to keep getting them to go deeper? And so we had tasks we looked at, we did some sorting activities. What was rate and what was ratio, and why kind of contexts of visual representations that

might reveal that? We had an opportunity to do some collaborative matching activities, to form a group of four with four pieces, and how would those show ratio or rate? And it's all of these kind of intentional decisions and planning for learning activities that helps get through the messiness, right? Because ultimately all of us want to be confident and have efficacy in the content that we're going to be working with, whether we're facilitators or whether we're teachers, or whether we're students. So I think part of that is developing those strong facilitation skills to support people through the process, but really thinking carefully and intentionally about the kinds of learning experiences that will help people work through the messiness, to come to that place of understanding.