Empowering Students in Math
Misconceptions

AMY ZORZETTO: When we come to the carpet reminder that it's our time to share our learning, but more importantly it's our time to?

STUDENT: Reflect?

AMY ZORZETTO: Mm-hmm, reflect on what?

STUDENT: On what we learned.

AMY ZORZETTO: Right, so we're--

STUDENT: And not what we did.

AMY ZORZETTO: And not what we did right? So it's about the learning that came from what we did. And that's really important when we do that boys and girls, and that we share our learning with each other. So when we're doing this today I want you to think about the learning that you've had this morning, okay? In the first two period and I want you to think about what you have learned from what you did, and how you're going to communicate that with the rest of the group, and how you're going to justify your thinking about what you did.

STUDENT: Sometimes we do group activities on the carpet when we're reflecting, and then once someone's sharing something then we'll do an activity about that sometimes to help the people that don't understand it.

AMY ZORZETTO: And Okay, so I had some of my friends that were in the hall using Dash today, right? And so you guys were programming Dash. And so maybe you can tell me a little bit about what you learned from programming Dash?

STUDENT: I don't share what I did, I share what I learned. 'Cause if you're just sharing what you did then that's not a good choice 'cause no learning came out of it. We learned that from here to all the way there there's two turns. There's one turn at the front, and there's one turn at the back and the distance between those is 34 cm and altogether it was 36 cm--not centimetres, metres.

AMY ZORZETTO: Does it matter?

STUDENT: No.
AMY ZORZETTO: Doesn't matter? Mohammed, you don't think it matters? Centimetres, metres, it doesn't matter? No? You think it's the same?

STUDENT: Yeah.

AMY ZORZETTO: So do you guys agree?

STUDENT: No.

AMY ZORZETTO: So, Mohammed, tell me--can you grab a metre stick there and show me--'cause we've used the metre stick before you and I right? So Mohammed, tell me about that metre stick. How many metres is that?

STUDENT: 100.

AMY ZORZETTO: Does everybody agree?

STUDENT: No.

AMY ZORZETTO: Oh, it has 100 on it, right? So it gets kind of confusing. So what do you think--there might be some letters on there that might be able to help you? Or does somebody want to help him out? What's the 100 mean that's on there? Let's give him a second and then what do you think the 100 means, Mohammed?

00:02:32.06 >> 100 metres?

AMY ZORZETTO: So take a look. I can see it right at the end next to the 1. What letters do you see there?

00:02:38.82 >> Centimetres.

AMY ZORZETTO: CM, right? You see the letters CM and that stands for?

STUDENT: Centimetres.

AMY ZORZETTO: Centimetres. So every one of those numbers means what?

STUDENT: A centimetre.

AMY ZORZETTO: Centimetres, and what number does it go up to?

STUDENT: 100.

AMY ZORZETTO: 100, so 100 centimetres and you said that you measured and you talked about metres, not centimetres and Mohammed said that he thought
they might be the same. And so when we talk about that, what you have in your hand describe that to me. What do we call that?

STUDENT: A metre stick.

AMY ZORZETTO: A metre stick. Why do you think we call it a metre stick?

00:03:11.16  'Cause it has centimetres on it?

AMY ZORZETTO: It had centimetres, there's also another reason. Can you think of why we call it a metre stick?

STUDENT: Ooh.

AMY ZORZETTO: Have you heard the term metre before?

STUDENT: No.

AMY ZORZETTO: Oh, maybe that's a new term for you. So a metre--does somebody want to help him out and describe and explain that to him? Okay, Dara, do you want to do that?

STUDENT: A metre is 100 centimetres.

AMY ZORZETTO: Okay, and so that stick is equal to what though?

STUDENT: Equal to 1 metre.

AMY ZORZETTO: 1 metre.

STUDENT: So a metre is 100 centimetres and a centimetre is way smaller.

AMY ZORZETTO: Can you show him what 1 centimetre is on there?

00:04:01.39  1 centimetre is--oh, you can't see the 1 centimetre up here. Tape on it. 1 centimetre right there. That's the first centimetre of the whole thing.

AMY ZORZETTO: Okay, so you're showing that on the ruler too? Is it different on the ruler or on the metre stick, 1 centimetre?

STUDENT: No, it's the same.

AMY ZORZETTO: No, it's the same?

STUDENT: But that only goes to 30.
AMY ZORZETTO: That only goes to 30 and that one goes to?

STUDENT: 100.

AMY ZORZETTO: 100 centimetres, so we talk about that when we talk about metres and centimetres we call them units right? And so in that case, Mohammed, would 1 centimetre be the same as one metre? You think so? So show me what 1 metre is. Start from the end and show me where you would stop when you--where's 1 metre?

STUDENT: [INAUDIBLE]

AMY ZORZETTO: Oh right at the end, you guys agree?

STUDENT: Yeah.

AMY ZORZETTO: Do we agree with that? And so what would 1 centimetre look like? How far would you go down the metre stick for? Oh, so is that the same? Did you go the same amount of distance?

STUDENT: Yes.

AMY ZORZETTO: You did? I saw you go from that end all the way to the end. Dara, point to where he pointed to. You started from where your finger is at the end and went all the way down, and then show me 1 centimetre.

STUDENT: I [INAUDIBLE]

AMY ZORZETTO: Where's the 1 centimetre? So it's from the end of the metre stick just to that spot. Do you think that's the same measurement?

STUDENT: No.

AMY ZORZETTO: Does it have the same number though? 1 metre, 1 centimetre.

STUDENT: Yeah.

AMY ZORZETTO: So that's kind of confusing sometimes, right? But what do we need to know then when we have the number 1?

STUDENT: The units.

AMY ZORZETTO: The units. So it could be 1 metre, 1 centimetre. What's another thing we say? 1?

STUDENT: Millimetre?
STUDENT: 1 kilometre.

AMY ZORZETTO: 1 kilometre.

STUDENT: 1 mile.

AMY ZORZETTO: 1 mile yeah so we have lots of different--so we need to know what the unit is, right? Because the 1 is important, but we have to know what the one actually stands for, right? Does that make sense now? So when Novo, he said 34 centimetres and then he said no, no, no I mean 34 metres are they the same 34 centimetres and 34 metres?

AMY ZORZETTO: The idea around that reflection time is that it's a very comfortable, it's a very safe place that's created throughout the year. It doesn’t start like that. It takes some time to be able to build that sense of community that we build that knowledge together and that we help each other and so you probably noticed that the other students were very supportive. They weren't judgmental. They were willing to offer suggestions or maybe a prompt or some thinking that went with that and so we've worked on that all year so that the students were able to do that and part of that for me was to uncover what the student actually did know and also for me to decide--it's that question of how long do you spend with that one student in front of the whole group, but enough for me to understand where I need to go next. And so it's important for me now to follow up with that student to uncover if there's any more misconceptions or to work on that misconception and see if it has been changed, if the thinking's been changed and if it hasn't that's okay too because then that's where we work and that's where we move with that student forward.

AMY ZORZETTO: We all have misconceptions and we all have learning in every area and so we will all experience that and every student in the class has experienced that at some point. And so how do we support that student to do that? and the class was doing that in a very, very productive way and I think that, that was really rich and powerful and I think the piece around the student not really understanding it but being able to share that and being able to not really change his thinking because he wasn't ready to change his thinking. And so he hadn't made that connection yet and that's okay because that's where the student's thinking is at, at that time. And so when we look at the experiences that, that student has had, he missed one year of schooling in Canada, came back to school this year. So I'm not sure what his experiences were last year and so it's important for me to understand that. It's important for me to take where the learning is, where he's at right now and move forward with that learning rather than force that learning. I could've told him the answer and I could've moved on right? But he wasn't ready to accept that answer and that's okay because he needs to have that opportunity, the experiences to build the knowledge so that he then makes that connection and he internally understands that concept rather than just being told the answer.