AMY ZORZETTO: So I asked the boys that were doing this, this question. They were using the trundle wheel and they were using the metre sticks and I said to them it's okay to do that, right? Like that?

STUDENT: No.

STUDENT: No.

STUDENT: No.

AMY ZORZETTO: Aiden, what do you think? Is that okay to do that? That measurement? Measure like that with the metre sticks like that?

STUDENT: No.

AMY ZORZETTO: Why not?

STUDENT: Then you would not have--

AMY ZORZETTO: Sh, let Aiden share his thinking okay?

STUDENT: Because they're not touching.

AMY ZORZETTO: Is that important?

STUDENT: Yeah.

AMY ZORZETTO: When we measure is it important?

STUDENT: Or else you won't get the right answer.

AMY ZORZETTO: Why?

STUDENT: Because there's a gap in between and it's not getting measured.

AMY ZORZETTO: We were measuring to take Dash down to the office, right? And would it make a difference if every time we had a little bit of a gap like that if we measured?

STUDENT: Yes.
AMY ZORZETTO: Why? What would happen? What would be a consequence? Not a bad thing but a consequence?

STUDENT: It wouldn't be the right measurement because if you programmed Dash to go the metres that you thought it was, but it wasn't actually that then he would go to a different place because he...

AMY ZORZETTO: Hm, so how is that connected to coding?

STUDENT: Well it's connected to problem solving like--

AMY ZORZETTO: What do you mean?

STUDENT: 'Cause—

AMY ZORZETTO: Explain that to me, Sienna.

STUDENT: 'Cause we have to prove that it's going to the place we want it to. So we have to problem solve to make sure it goes to the right place. If there's a problem or something you can problem solve it, and it's not just like at school that you problem solve. It's everywhere.

STUDENT: Remember yesterday when we were doing those math process expectations? One of them was problem solving and then the group that did problem solving figured out ways that they were connected to coding. So this is problem solving and then problem solving is connected to coding.

AMY ZORZETTO: Boys and girls, do you agree?

STUDENT: Yes.

AMY ZORZETTO: So what have we learned about coding that in terms of--

STUDENT: That we don't give up?

AMY ZORZETTO: That we don't give up. But why?

STUDENT: Because we need to problem solve to fix the problem.

AMY ZORZETTO: Yeah, and so when we go to do coding, when we go to do the programming it's really important for us to think about how the idea that we try something and then if it doesn't work what do we do then?

STUDENT: Re-try.
AMY ZORZETTO: We just re-try, right? We just keep trying. And so it's really important that we also have to do what with each step? We talk about that word.

STUDENT: You have to specific if you--like what I said before you have to program the right thing. And if you don't program that right then it's gonna go somewhere else.

AMY ZORZETTO: And if it goes somewhere else have you met the requirements of what you had planned to do?

STUDENT: No.

AMY ZORZETTO: And so what do you do then?

STUDENT: Problem solve.

AMY ZORZETTO: You have to problem solve. So it kind of keeps coming back, right? In order for the students to fully understand any sort of concept and I'll focus on math but I think it's everything they have to really be able to experience the concept in a very concrete way. And so that may be through manipulatives, may be through play, it may be through some sort of authentic learning. It depends on what they choose to do but they have to be able to come to that understanding so that they've made the connections themselves because when we make those connections we then hold those connections. And so they're then able to transfer those connections to other things. And so what I've seen with the students this year is that sometimes somebody will just say the answer and then the student will repeat the answer after them and we all can repeat what somebody has said but they don't understand, and we know that. And so it's really important for us to go back and work with the students to see if they've made the connections in the math to be able to understand how the math works and for them to have some sort of deep understanding with it because everything in math is connected to something else in math. And so without those deep understandings in a specific area they're going to have a gap in another area. And we know that we have to bridge those gaps. We have to fill those gaps and so by having the students understand concepts in a very concrete way they've then made those--they've started to help fill that gap and started to bridge to another idea or concept. There's one question that I wanted to ask about this. So around equations, and so we talked about that. WE have to have all those operations--or sorry we have to have an equals sign, and we have to have operations. So Owen, you noticed something today that Dara helped you with. Can you just tell us about that part? Not necessarily what your equation was, but what Dara helped you think about?

STUDENT: On one side of the plus signed I should do...almost an equation itself and on the other almost another equation.
AMY ZORZETTO: Now do you remember what those are called on either side? The equation makes the whole thing, and on each side it's called?

STUDENT: A balanced equation.

AMY ZORZETTO: You're gonna create a balanced equation with expressions, right? Yeah, you did it with monkey math today. I saw you over there doing that. So Carter, thank you that. SO you were talking about doing different operations on either side, Owen, right? You were doing different operations and Dara suggested that you push your thinking that way, right? Carter, we worked together, right? And you did a bunch of them here and I'm gonna show a couple of these. So you talked about you added them up in different groups, right? And then you came to some understanding. Can you share what learning you had from there? So think about it, you had this. You did 36 is the same as and I'll help you, he did this. He focused on this one. So how many are there boys and girls? I'll do it again so you can see.

STUDENT: Six.

AMY ZORZETTO: Six, and then what did you do next? You remember? These two rows. So then he circled that. How many are there altogether? So this is one row of six and he did these two rows together which makes?

STUDENT: 12.

AMY ZORZETTO: 12, and then he's like oh, okay I'm just gonna jump to the big numbers right? And he did the top three. And so what's three groups of six?

STUDENT: 36.

AMY ZORZETTO: Three groups of six is 18. So he added 6+12+18 and then he said to me? What? What did you decide next?

STUDENT: 6x6.

AMY ZORZETTO: So he did this. I'll demonstrate, I'll be Carter. He went like this, he went it's all of them. And I go what do you mean? And he goes there are six groups and I said oh, well how many are in each group? And he said?

STUDENT: Six.

AMY ZORZETTO: Six. Six groups of?

STUDENT: Six.
AMY ZORZETTO: But he actually said it--he didn't even say six groups. He went right to multiplication and said 6x6 and I prompted him to say well what does that actually mean? And he said? Six groups of six. So then I said to him well how do we figure that out, the total number? How do we do that? And so he did another strategy and this is a strategy I wanted you to know. My friends in grade 2 this is what was expected in terms of multiplication right? So you're understanding that multiplication is really adding the same number in as many times as you need, right?

STUDENT: Repeated addition.

AMY ZORZETTO: And it's called--and Carter named it for us, it's called?

STUDENT: Repeated addition.

AMY ZORZETTO: Repeated addition, and so that was a new term for Carter to be able to connect it to multiplication. And so because some of us are in grade 2 and some of us are in grade 3 some of us are doing multiplication and calling it multiplication, and some of us are calling it multiplication and how it's connected to repeated addition, right?

I think the biggest piece for me is that I have to know the curriculum. So whereas when I reflect back on my teaching years ago I'd spend hours preparing a lesson whereas now I spend most of my time either reading the curriculum again even though I've had experience with it and think I know, I always refer back to it. And then also reflecting on what the students have done and how it aligns with the curriculum to see where I need to go next. So it always goes back to the curriculum and how the students are being able to meet the expectations that are outlined there. And the nice part about the way that the curriculum is laid out is that we have a whole range of expectations in different strands and when we learn in an inquiry-based program like this we see the alignment of a lot of those expectations. We see the interaction between those expectations happening in real life and so kids will be doing things and you'll see measurement come up, and patterning, and number sense and all of those things that are all connected and then it's my job as a teacher to make those--to notice and name that learning and make the connections for them as well of how they're seeing different strands within maybe one activity or within various activities that have happened that day.