MARGIE TRAINER: Thank you Elysha for doing such an amazing lesson and what we want to do is just sort of talk about your feelings about how the lesson went today.

ELYSHA PASSEGGI: I think it went well. It definitely went longer than I anticipated. I don't think that they…I think they were still calculating a lot, so it seemed to take longer because they weren't getting the relationship between the numbers as quickly as I thought that they might have. So I think it took a lot of time to kind of tweak out because I didn't want to disvalue what they were saying because I thought it was important. It just was different than what I thought they might recognize. I thought they might recognize the kind of pattern that was happening over and over again with the change in the numbers, but it just wasn't coming out.

MARGIE TRAINER: And why do you think that? What is it that they've been doing that sort of blocked that transition that you were hoping to have?

ELYSHA PASSEGGI: I think two things. I think first it's just number talks where they're able to manipulate and move numbers around. So you heard a lot of "well, I took a one from here and I put it over there to make this that," so I think that was the first kind of block they were having a hard time getting over. I think the second thing that was challenging for them was spending time doing hands-on equations, which looks at balancing an equation on a scale kind of with algebraic thinking. And I think what they were trying to do was balance both sides of the equation. So for example, like on this one, I think one of them was saying how they wanted to get both these numbers to be twenty-one plus twenty-one, so that it would be the same as this, and then they could visually see that it was equal. I think another thing they were doing is -- in reference to hands-on equations, for example this problem up here. If it was nine plus what equals four plus seven, for example, they naturally want to try and get rid of some of the numbers on each side of the equation. So they might see, for example that a nine is a four plus five, and if they could break it apart that way, they could cancel out the two fours and make the problem easier. I think because of that, they were having a hard time looking at the relationships on the sides of the equal sign. Because I think that they were kind of getting stumped as to what to do next and then they went back to calculations. Whereas, if they were able to kind of look at it as… instead of x as an open box, like the bottom one here, I think that they might have been able to then say "OK, what is the relationship between the numbers on both sides," instead of just trying to cancel something out. You even heard them say "and then I canceled out," but I don't think they really understood what they were really doing when they were "canceling out."

MARGIE TRAINER: So what do you think is going to help make that transition? Because they're obviously able to think about the balance and manipulating both sides of the equation to keep that balance, so what would your next steps be to make this kind of a thing more visible to them?

ELYSHA PASSEGGI: Um, I mean, I think looking at the number tiles which we were talking about earlier and having them maybe put ten number tiles out, and then if you break the number tiles with three and seven, it's still ten number tiles even though there's three on this side and seven on this side. And if you then broke it to be six on this side and four on this side, however you split the ten, there's always going to be ten. And even writing that out, you know, what the different equations were, there was always

ten and it never changed. I think that might be a step back to help them see that the value is not changing within the equation. I think also, I'm not quite sure…I feel like they're so ingrained with the hands-on equations, that how to kind of undo that, or make the connection between the two, I think is important. I think that would be a really big next step for them, making that connection.

MARGIE TRAINER: I'm just going to ask you this to make sure I understand. So if you were setting it up so that they could see that say three plus seven is ten, but if you move the one to the three making it four and six, it's still ten. You'll still have a total of ten over here. So could you set it up so that they could see three plus seven and then is equivalent to the equals is that the same thing as the four plus six, and then maybe move it so they can see that it's actually the same and really what you're doing -- that you were moving one to…

ELYSHA PASSEGGI: Right. I think they really need to move it and manipulate something physically to kind of make a connection to what is happening in the numbers. I did feel it was a little abstract for some of them and at one point I had them do a shoulder partner share because I noticed there was kind of less hands and I didn't think they were making as many connections. So I thought if they shared with their partner, maybe they'll make a connection. And I remember Maddy, I called on her again because I knew her partner understood the relational thinking, so I wondered if it kind of broke through to her and she went right back to "and then I put a one on this to try and get twenty-one."

MARGIE TRAINER: What that tells me is that they need…just like they've had a lot of practice with hands-on equations, they need a lot of practice with this, with being able to see this. And recording it this way consistently so that they can start to see that in addition -- this is only with additional operations, is that if you change one addend a certain way, the other one is the opposite change. And they're not ready to verbalize that yet, so a lot more experiences is going to be needed for that to happen. And then what about recording it the vertical way?

ELYSHA PASSEGGI: That was the other thing I was going to say. I think if they were recorded more vertically, which I did on one of them here. I think this is important because it very clearly shows the change. And I didn't do it as I kept going because I wasn't really sure that they were understanding what was happening. So I think that that's something that needs to happen. It needs to be recorded not just this way because I don't think that they were making the connection as much with it this way as here, you might recognize the pattern as the same over and over. And somebody did try to say "it's always plus or minus one."

MARGIE TRAINER: They were getting there. This is great with the arrows and showing the change and so on. But if they start from one and pair it up with one and the other so you're going in the same direction, but that wasn't what was happening all the time. And it takes a little practice at recording that way. And the other thing I noticed is they are -- from number talks I'm sure, being able to move within the same addends, pair of addends to get the same pair on the other side, which is a great number talk strategy.

ELYSHA PASSEGGI: Right, they really wanted to do that. That was what they kept reverting back to and it was funny when I would say "without calculations," the first hand up would be a calculation. They weren't able to connect that they weren't calculating.

MARGIE TRAINER: So it looks like it's really more time doing this and making the connections deliberate. And you'll probably have to drive that process. You'll have to record this way and you'll have to keep

asking them to verbalize and share with their partner so that it's up here, just like those other number talk strategies that were up here. But they're definitely in the right direction and where some of them are just on the verge of it and some of them are still back in the beginning stage. What will your next steps be then?

ELYSHA PASSEGGI: So I think it would be continuing with number talks, looking at these types of numbers, using tiles like we talked about to manipulate the numbers back and forth and start to recognize that you're not taking away, it's always the same, you can trade from one side of the equal sign to the other. I think more experience with two addends on each side of an equation. I think that was something that they were struggling with trying to see. And I think going back to hands on equations too and starting to try and make connections with…

CAMERAMAN: Sorry can you start with that one part again, there's that sound or something.

ELYSHA PASSEGGI: Sure. I think going back to hands-on equations and making connections between actually what's happening there in relationship to this type of a problem, so that they could see that they don't just have to try and cancel something out, but that they can look at the relationships and the number properties and what is happening on each side of the equal sign.

MARGIE TRAINER: Right, that highlights that maintaining the balance.

ELYSHA PASSEGGI: Right.

MARGIE TRAINER: Just out of curiosity, if you were to look at your class and say about how many of them approximately are with, you know part of the class would you say is probably on the verge of being able to articulate any of this?

ELYSHA PASSEGGI: They seemed really engaged but I think, I don't know, I want to say a third to a half maybe. They just kept going back to calculating, so it was hard to… I think also there needs to be a discussion about what is a calculation. Because they…if they're not stacking it up or they're not solving a calculation directly, I think that they weren't connecting it as calculating numbers.

MARGIE TRAINER: It sounded like your sense is that, you know, if you're saying approximately a third of your class is really kind of getting it that maybe doing more partner work…

ELYSHA PASSEGGI: I think so too.

MARGIE TRAINER: And having those discussions where they can make sense of it among themselves. That has to be another step.

ELYSHA PASSEGGI: Yeah, that definitely needs to happen. That needs to happen and I would've done more of that if I had more time to kind of let them share. Once they started sharing it was very loud and noisy and they were talking about the numbers. So I think they were definitely engaged and hearing one another. So using that to build upon everybody's knowledge I think would benefit them.

MARGIE TRAINER: I think that would be an excellent step. Elysha thank you so much.

ELYSHA PASSEGGI: Sure, you're welcome.