MARGIE TRAINER: What I wanted to ask you two ladies is, first of all which learner's method were you looking at?

STUDENT: Um, we were looking at Learner B.

MARGIE TRAINER: Learner B. And that was the one with the 4 plus all the 3's?

STUDENT: Yeah.

MARGIE TRAINER: Okay. And I thought I heard you saying that the 4 was the 4 that was there to start with. In what pattern was that? Where did you see the 4?

STUDENT: Well, I was seeing the 4 in how many things I was supposed to be adding because I was looking at...there were as many patterns as you can think of, and then at pattern 11 there would be 34 buttons in all. And then there would be three 11's, well three 11 pairs of white buttons, and one little black button. And so there's...11, and 11, and 11, and then the little black button. So there are four things we were supposed to be adding.

MARGIE TRAINER: Oh, okay. So that was where the 4 came from? And did you agree with that?

STUDENT: Yeah.

MARGIE TRAINER: Okay. Um, when you were describing to the class that method and you said 4 plus eleven 3's, is that how you solved the 4 originally then or was this different now? Just the different way of...

STUDENT: It was a bit of a different way of thinking it because we were a bit confused at first.

MARGIE TRAINER: I see. I have one other question. Did you count how many 3's were actually added? STUDENT: Yeah, we did. There was only ten 3's and one 4 so.

MARGIE TRAINER: Oh, is that where the confusion was?

STUDENT: Yeah, that's where we were confused.

MARGIE TRAINER: Okay. Thank you.

STUDENT: I see how Maddie and Kelsey were thinking about it and I think that that's right, but I still think that Morgan, Eric, and I were like more right.

STACY EMORY: Okay, now I'm intrigued by that statement, that you guys were more right. So when saying that, are you saying that one way is a more correct way to look at this pattern than another? Tell me a little bit more about what you mean by being more right.

STUDENT: Well, I understand how Maddie and Kelsey were seeing it and I get how it would be right, but I still feel that ours is more...it's kind of, hmmm. Um, I see how they were doing it and I see how they would've come to that but I still think that ours is right.

STACY EMORY: And based on what? On some of the mathematics you were seeing or some of the mathematics you were doing? Or what was it that makes you feel more tied to your way of explaining the pattern or looking at the pattern?

STUDENT: Well, um... The main thing that I think was the difference between our strategy and theirs was um, they had the front pattern two to three, they still had the same... So they had the main 4 and then the ones in the different color that were being added. From the ones that they had added on pattern 2 were still the same color that meant the ones that were being added on pattern 3. And ours had changed to be the different color that meant that they were just staying like that. And um, I think ours is right because 3 + 3 + 3 is true that they started with the 4 and the 3's are being added, but once the 3 is added to the 4, it's 7 but not 3 + 4. Like it's both but it's more a 7 than a 3 + 4, sort of.

STACY EMORY: So is what staying the same shifting from pattern 1 to pattern 2?

STUDENT: In which one?

STACY EMORY: The one that you were just describing, where you said that before you broke it apart it's 4 + 3 is really 7.

STUDENT: Well, it's both but if it was like a math problem 3 + 4, I would say it was 7, not 3 + 4.

STACY EMORY: So you guys were both looking at Leaner B, correct?

STUDENT: Yeah.

STACY EMORY: Okay. So it's just...were you finding some difficulties with the way it was being represented using the different colors from pattern to pattern? Was that giving a different meaning as it was going from pattern to pattern in your mind?

STUDENT: Uh, yeah.

STACY EMORY: Okay. So you liked the way that you represented it graphically. That seems to be a more accurate way of representing what was going on than the way they were doing it graphically?

STUDENT: To me, yeah.

STACY EMORY: But was there any difference in the number of buttons in pattern 2 from the one you were doing and their pattern 2?

STUDENT: Mm-mmm.

STACY EMORY: So the numbers of buttons were the same, you guys were just representing it differently?
STUDENT: uh huh.
STACY EMORY: Okay. Thank you.

MARGIE TRAINER: Maddie and Kelsey, I got a chance to talk with you while you were working and I was very interested in the way you were explaining how you were seeing this pattern growing. And you had Student A, is that correct?

STUDENT: No, B.

MARGIE TRAINER: You had B?

STUDENT: Yeah.

MARGIE TRAINER: Okay. Would you like to tell us how you saw that pattern growing?

STUDENT: Well, we thought the ones that were staying the same, we thought that they were staying the same through all the patterns, not just from pattern to pattern. So it was like always 4, not like 4 then 7 and then 10.

MARGIE TRAINER: Okay. And the 4 were where? Where did you see the 4 in the pattern?

STUDENT: The 4 we saw the one in the middle and then the 3 surrounding it.

MARGIE TRAINER: So that was always there no matter what the pattern number? Is that correct?

STUDENT: That's where we got...the learner got the 4 from because what the learner did was she did 3, like he did three 11's, he meant to do 11 but he only did 10. And then he added a 4. So we were puzzling how he got that 4 and we came up with the explanation of how he got the 4.

MARGIE TRAINER: And you also noticed that he only added ten 3's is that right?

STUDENT: Yeah, I think that was just a mistake because he, at the bottom of it he had each thing numbering the 3's, and he did eleven but he really only put down ten 3's. But that was just a mistake, so.

MARGIE TRAINER: And did you check in out mathematically to see that eleven 3's plus 4 would give you 34? Did you see if that worked?

STUDENT: It was ten 3's.

MARGIE TRAINER: But it was ten 3's. So ten 3's worked, plus the 4 and gave you 34. And you believe that 34 was the right answer?

STUDENT: Yeah.

MARGIE TRAINER: But you don't know where the um, but you still think it should've been eleven 3's? STUDENT: No. Right?

STUDENT: Well, the way that we were thinking it in our thinking was, but when we looked at this person's work, it's not there.

MARGIE TRAINER: Okay. Alright that's fair. Do you think it's possible that people can look at the very same pattern and see it growing differently and still get the same total number of buttons? STUDENT: Mm hmmm.

STUDENT: Yeah, definitely.

MARGIE TRAINER: Okay. And did it help you to look at other students' thinking because was this the same as your thinking or was this different?

STUDENT: Mine was Learner A's thinking. We did Learner B, so.

MARGIE TRAINER: Okay, so you saw it the way Learner A did. Could you sort of describe that? What did Learner A see staying the same?

STUDENT: Um, well he, what Learner A did is the person didn't exactly see things staying the same, in my opinion. What they did is they just saw that there were three sides of the whole problem, like on the button shirt over there. And then they did 11 times 3 because there was 11 strips of buttons where there's supposed to be...it was problem 11, and then they added one because there was the middle button.

MARGIE TRAINER: Oh, so that one was always there?

STUDENT: The middle button? Yeah.

MARGIE TRAINER: The one? So that would be, you would be adding no matter what pattern you looked at, you would always start with one because that was in the middle?

STUDENT: Mm hmmm.

MARGIE TRAINER: And then adding groups of three? Is that what you're saying?

STUDENT: Mm hmmm.

MARGIE TRAINER: In groups of three because it was what? Going in different ways?

STUDENT: Maddie, do you want to...?

STUDENT: In three ways.

MARGIE TRAINER: In three ways, interesting. Well, girls thank you very much!