Student Debrief Part C:

FRAN DICKINSON: I want to get you guys to talk a little bit about the work that you guys did. So I saw you guys worked with Learner A and we did a lot of talking about Learner B in class today. And we didn't get a lot of chance to kind of explore Learner A, so I thought it would be great to talk to you guys because I saw that you worked on Learner A. So can you guys tell me a little bit about the color coding and how you were thinking about Learner A's work?

STUDENT: The orange is the new stuff.

FRAN DICKINSON: So the orange is the new stuff. So here we've got three new things and then here we've got the three new things in each stage.

STUDENT: It was 3 times whatever stage it was, is what I think they were thinking about. These ones right here, they were from the old ones, so they turn black on the new one.

FRAN DICKINSON: Okay. So what I see happening here is that you've got that one in the center, that one black dot here because that's original there. I'm wondering about that then. So was that...was there a stage before pattern 1? Were you thinking about?

STUDENT: Well, I mean there could be a pattern zero.

FRAN DICKINSON: There could be a pattern zero?

STUDENT: Yeah.

STUDENT: Zero would be like all the other ones and you would just have to subtract three. This is subtract three to that, subtract three you got that, you subtract these three and you got just one little dot.

FRAN DICKINSON: Oh! Why the three? Why are you subtracting three each time?

STUDENT: Because it's multiplying and each time you add one more and times it by three. So if you, um, subtract three from that then instead of, um, because one times three, so you're just subtracting it to the next level under it and then subtract that, you got one. And you can't really go any further down.

FRAN DICKINSON: So if we were going to go back to stage zero or pattern zero, you think that that's where we'd stop, we couldn't go any further?

STUDENT: Because there's no 3 to subtract.

FRAN DICKINSON: Ah ha, no 3 to subtract! So I want to kind of switch gears a little bit and come back up here to this learner's work. Learner A writes "I multiplied 11 times 3 and then added 1 equals 34 buttons." So 11*3+1=34 and that's how they're thinking about these 34 buttons. My question for you is where's the plus 1? What's that plus 1 that that learner's thinking about?

STUDENT: That little first dot.

STUDENT: Well, um, Learner B was talking about 4 plus 3, plus 3, plus 3, so he was thinking about 4 and this guy, this person was thinking about 3 plus 1.

FRAN DICKINSON: Okay.

STUDENT: Instead of 4.

FRAN DICKINSON: So that's the difference between Learner A and Learner B that I hear you saying. Good. So what you're saying is that Learner B was saying 4, where Learner A was saying, 3 plus 1 for that 4. Well, you said that this is the plus 1 right? What happens when we move to this stage? Where's the plus 1 now?

STUDENT: Um, it stayed with the last stage. I don't know.

FRAN DICKINSON: Stayed with the last stage. How would Learner A think about this stage? What rule...how would they use it as rule to get to the total number of buttons in that stage?

STUDENT: I don't know. Um, the columns, I think, so that would be, like, Maddie, she drew the domes...

FRAN DICKINSON: Yeah, those rainbows right?

STUDENT: Each one would be three if we just drew another dome over the one then it would be 3, 3, and then 1.

FRAN DICKINSON: Okay, so really, what you're describing then is two groups of 3 plus that 1 in the center.

STUDENT: Mmm hmm.

FRAN DICKINSON: Good. Interesting. I had that question because as I was looking at your color coding, I could see the plus 1 that's here but I was wondering about it over here, and how you were thinking about it. But it sounds like you were thinking that we were adding that 1 in each of those sessions. Good, thank you guys for hanging out and talking.