S-Pattern Task – CLIP 1

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District: Pittsburgh Public Schools
Grades: 11-12

Group 1 – First Interaction with Teacher

S: The top is your *x* but that's constant. That's always gonna stay the same.

S: Okay.

S: So, then you have to find the number that's before *x* to get to that. You already found what you have to add to get to that. Now you have to multiply to get to that.

S: We figured this *(pointing to the table)*…

S: We found out a pattern.

S: I can't do equations. I can't factor. So...yeah, we figured that out first period.

T: Okay, so, you're...okay so you're going to start with a table and see if you can find the equation from the table?

S: Yeah.

T: Okay.

S: But we don't know how...we don't know…

S: I don't even know how to start to find the equation there.

S: We know what the "*b*" is. We don't know if it should be *x* + 3 or *x* + an odd. *X* + an odd 'cause these are all odds on the bottom.

T: Right.

S: They're always going to be odds. So it's plus 2 between them. There's a difference of two between them.

T: Okay.

S: We already know the top rows are *x*. One, 2, 3, 4...like that's our *x*.

T: Right.

S: Our pattern. The growth is…I don't know what the growth is.

S: You got something.

S: The growth is an odd. It's like odd numbers.

T: Okay, so you have the table, you have these numbers written out.

S: Right, if we had the equation we should be . . .

S: How do we graph it with no equation?

T: Well no kidding. Oh yeah, if I gave you the equation, life would be great. What do you have?

S: This.

T: Which is a what?

S: *S*.

T: Okay. It has what?

S: Squares.

T: Okay. How many?

S: 26.

T: In number 5?

S: Yes.

T: Okay, that's 26. There's no other way you can come up with that number 26 than just counting?

S: You can go by, like ...

S: So *x* plus . . .

S: He's leaving us.

Group 2 – First Interaction with Teacher

S: I broke it down real easy, real simple to this. It obviously looks real simple. So…

T: Do you guys know what he's doing?

S: Yeah.

S: Yeah.

S: We all helped.

T: Hold up. You did this. Tell me what you did. You don't know?

S: I was working by myself.

T: Oh, okay. Do you know what he was doing? Okay what's this?

S: This is a group effort.

S: I know.

S: Whatever the pattern number is, not even looking at...not even looking at this, just whatever the pattern number is, you take it and you times it by 2 because there's 2, there's obviously 2 rows and each...the top row and the bottom row both have the number...this number, the 2. And then times that by 2 and that will give you the top and the bottom and the middle is a square so…

T: Right.

S: You min...you do 2...you do the...ah, I'm going to call this x. $(X - 1)^2$. That will give you the middle and you just add them together.

S: I understand him, I just can't explain it.

S: Did you understand that, Zieg?

T: Yes.

S: And then I got another one, I got another one, though. I don't know...if you take it and go this way, rectangle, you take $x + 1$ and then do $x - 1$ and that will give you, that will give you this dimension right here.

T: Go back to the first one. There. Look at what he's doing. Tell me what he is doing.

S: What do you mean, like?

T: When he came up with it, when he was explaining the top row and the bottom row and the center, do you know what he was talking about?

S: Yeah.

T: What?

74 S: I don't know how to say it, but I helped him do that, too, like it's not just all him.

75 T: Okay. So tell me, show me. I mean, do you have it in your head? Is it on paper?

76 S: It's in my head. He said that, okay, the middle, there's one square in the middle and
77 then there's 2 on the top. Subtract 1 to get the number...subtract one and square it to
78 get the number of the boxes in the middle.

79 T: Okay.

80 S: So x - 1...so 3 - 1 is 2 and then you square 2 to get 4 in the middle and then you multiply
81 the whatever sequence you're on times 2 'cause there's a top and a bottom.

82 T: Okay. And that's how you came up with the equation? So, okay, can you take his
83 equation $2x + (x - 1)^2$ and can you put it to a picture? Can you put it to these pictures?
84 Like let's, let's, let's pull out, let's say number 4, okay? If we take this, how does this
85 picture right here relate to $2x + (x - 1)^2$?

86 S: So that's simpler than...

87 S: ...and then you add 2. You see what I'm saying? You see what I am saying, Nick?

88 S: That's simpler than…

89 S: That's the easy way to break it down. You go from...you just take these 2…