Making Ideas Public— Part 2

MATTHEW HARMON: We're going to have a discussion about some possible methods and ask you to see is there something different that someone else did that might help improve your understanding. OK, we're going to start with Zashon. Could you lay out your group's thinking as you came up with an equation?

ZASHON: OK, we came up with y equals 6 plus 5 times x minus 1. The y equals the total numbers of two peaks. And the 6 equals the six sides that you start for every hexagon. Plus 5 is the two peaks you add for each side because you already used this the six sides for the first one. And then x is amount of hexagons you have. And then for every hexagon that you add, you minus one because the side is used for the first.

MATTHEW HARMON: Why do you have to minus 1 in there?

ZASHON: Because for every hexagon you add, one side is added for the first one before it.

MATTHEW HARMON: Now where does the 5 come into play here?

ZASHON: The 5 comes from the five toothpicks added for hexagon.

MATTHEW HARMON: OK, the five toothpicks added for every hexagon. How did you use that equation to solve letter B, how many toothpicks for a row of nine hexagons? Your answer was 46.

ZASHON: I'll put y equals 6 plus 5 in parentheses 9 minus 1.

MATTHEW HARMON: What would you end up multiplying 5 by in that equation?

ZASHON: 8.

MATTHEW HARMON: 8. Could anybody tell us in the class where does-- how does the 8 come in here? Grace?

GRACE: You already have one hexagon. So you're only adding eight more and not nine more.

MATTHEW HARMON: Brandon, could you bring your work up?

BRANDON: OK. so I got 1 equals 5x plus [INAUDIBLE].. So basically, I got 46 by doing 9 times 5 plus 1, which got me 46 because you have 9 hexagons. And each one has five sides except the one that has an extra one toothpick on it. So you have to add that extra one as the-- kind of like the starting value.

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MATTHEW HARMON: Hold on. You said you have nine hexagons. And each one has five sides?

BRANDON: Well, each one has five except one, which has an extra sixth side. And basically, I'm adding that extra one to account for that extra side.

MATTHEW HARMON: Could you just point to on the diagram? Where do you see those numbers?

BRANDON: So each one counts as five because 1, 2, 3, 4, 5. This one is a part of the next hexagon.

MATTHEW HARMON: OK.

GRACE: So maybe 1, 2, 3, 4, 5, then 1, 2, 3, 4, 5 and 1, 2, 3, 4, 5, then 1, 2, 3, 4, 5, then 1, 2, 3, 4, 5. It's just there's not another hexagon. This counts as six for that hexagon.

MATTHEW HARMON: OK. So you need to add in that one to maybe complete the last hexagon. Could be the first one that you start with as kind of that starting number and then building out fives on top of that, right? There we go. I'm going to pose a problem here to you and see if you follow what this person did. I'm not quite sure if this is correct. I mean, they came up with the same answer. But I'm not sure if their work is accurate. Could you read that description? For those of us that can't see, could you read that?

STUDENT: I did the number of hexagons times 4, then the number of hexagons plus 1, then added it all.

MATTHEW HARMON: Where might they see that in this diagram? Hey, Jordyn?

JORDYN: Instead of counting the ones that the hexagon shared, they just count the ones each hexagon has on its own.

MATTHEW HARMON: Then how many sides? Like, how about on this one with five hexagons? How many vertical toothpicks are there across that?

STUDENT: Six

MATTHEW HARMON: What might be an equation we could write that would help us come up with that?