
Session Three

Conceptualizing and Representing Linear Relationships

Transcript: Polygon Problem Second Lesson

Amanda's and Jackie's Methods

[~5 minutes]

08:18 Cindy: I'm interested in hearing about the conversations you had at your tables. And so are there some people who are willing to share out?

08:24 Cindy: Even if you didn't come up with an answer that everybody agrees on, at least what kinds of things you talked about in trying to arrive at a solution.

08:29 Cindy: Now if we're doing whole-group sharing, everybody is listening to the person who is talking.

08:35 Cindy: And seeing if you agree, disagree, have a question about, and so on. Jackie.

08:40 Jackie: All right, um . . . We thought that . . .

08:41 Cindy: Wait, Jackie, some people are still talking.

08:44 Jackie: We thought that on top, running across the top, since you said each one was equivalent to an inch, we thought that there would be fifty on the top times the bottom would be times two, two sides, and then plus two on the very end, and we got a hundred and two.

09:15 Cindy: So I heard you say there were fifty, and let's just say there were fifty, and let's just call them units, we don't know if they're centimeters or inches or what . . .

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- 09:05 Cindy:** But there's fifty units across the top, you said, and fifty units across the bottom, and then from there you said what, Jackie?
- 09:11 Cindy:** I'm sorry.
- 09:12 Jackie:** We added two.
- 09:13 Cindy:** And the added two, OK, so you're saying over here and over here, you've got these sides. OK. Did anybody else look at it differently? Amanda?
- 09:24 Amanda:** We make a table.
- 09:25 Cindy:** You made a table. This was Jackie's sharing. OK, Amanda, go ahead.
- 09:30 Amanda:** OK, we made a table on what x , x stands for the number of blocks and y is the perimeter and for one block, there's, the perimeter is three, and then for two it's four . . .
- 09:47 Amanda:** For three it's five, and for four it's six. And so it's like saying x plus two is equal to y .
- 10:57 Cindy:** Now, I'm going to come back to this x plus two equals y business, because I'm wondering how, this looks pretty different from what Jackie shared.
- 11:05 Cindy:** Jackie, what did your group come up with for the perimeter of hundred equilateral triangles lined up in a row?
- 11:11 Jackie:** One hundred and two.
- 11:21 Cindy:** A hundred and two. So why is it that this is working? Is there a way that we can take this and connect with Jackie's group's model, their thinking?
- 11:33 Cindy:** Where is this rule coming from in this model? And Jackie's group has sort of gotten at it for us. Where's the plus two coming from? Hiromi.
- 11:45 Hiromi:** From the, uh, the edges.
- 11:49 Cindy:** The edges of the triangle that Jackie, in fact, pointed out for us, didn't she? She said

you've always got these edges here. So that's where that plus two is going to come from.

11:57 Cindy: Eric, could you put your feet down, please, and keep your chair straight.

12:02 Cindy: And I'm going to ask you the next question, Eric, so are you ready?

12:04 Eric: No.

12:06 Cindy: You're honest. Where did the plus two come from? Jackie has said it for us and Hiromi has said it for us.

12:12 Eric: The two outsides.

12:13 Cindy: You were listening. Thank you. The two outsides. So what does that leave for the rest of this stuff? Where does that come into the picture?

12:22 Cindy: Think about this. When we had one triangle, we knew the perimeter was three, we wrote that down here.

12:28 Cindy: Two, we knew it was four. With three triangles, we knew it was five. Take a look at this inside triangle. How many edges end up being shared?

12:39 Students: Two.

12:40 Cindy: Two, two out of three of the triangles' edges end up being shared. Interesting. And then what about, the plus two on the end we've already identified as being constant?

12:52 Cindy: You're always going to have your two outside edges, right?

12:56 Cindy: So where's this rule coming from? Why is it working? Jackie, where did your group get these fifties?

13:04 Jackie: The numbers of blocks, the sides, the number of sides that . . .

13:10 Cindy: OK, along the top, and then what about the . . .

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- 13:13 Jackie:** Same along the bottom, plus the two ends.
- 13:15 Cindy:** OK, Andrea, what are you thinking?
- 13:17 Andrea:** Well, I was just going to say that like, see there's the two triangles and the one in between, the one in the middle just make a point of on the bottom, it doesn't count.
- 13:24 Andrea:** And on the top the other two don't count, they're just the points.
- 13:29 Cindy:** So, I'm hearing Andrea say that when you put this guy in the middle in here you can't count this bottom part. It's just a point. We're certainly going to count these edges down here.
- 13:36 Cindy:** But for this triangle that we added only one side counts. And this plus two is coming in from over here. So for each triangle we add, the perimeter increases how much?
- 13:50 Students:** By one.
- 13:52 Cindy:** By one. Does everybody see where the plus two comes from? Does everybody see where the number of triangles comes from?