Session Five
Conceptualizing and Representing Linear Relationships

Transcript: Growing Dots 2 Lesson, Period 5
Angel's Question

[4 minutes]

16:58	**Kirk:**	OK, Angel. Can you ask that question again? Like really what you're getting at.
17:03	**Angel:**	How does the negative three relate to the picture?
17:11	**Esther:**	I didn't really look at all at the picture, I put the number of dots . . .
17:20	**Kirk:**	OK, that's fine. So you and Richard somehow came up with that rule. Angel's trying to figure out how it's connected to this picture over here. Dolores.
17:29	**Dolores:**	OK. What you have to do is plug in one. Is that right? That's like four. And it's like the dot is like one so you have to subtract three.
17:46	**Angel:**	Yeah, but how does the negative three relate to the picture? I don't see negative three in the picture. You don't see it in the picture. How do you see negative three in the picture?
17:57	**Angel:**	The picture! How do you see negative three in the picture?
18:08	**Kirk:**	OK. You got your answer. Could you say that again?
18:12	**Dolores:**	That's how you get negative three. You plug in one and you get four and you have to subtract three to get one.

18:20	**Kirk:**	Maybe this has nothing to do with the picture.
18:23	**Angel:**	It has something to do with the graph though!
18:28	**Kirk:**	All right. *[applause]*.
18:36	**Kirk:**	OK. Let's look at the graph here. Most of us agree that the equation was $4t - 3$ and yesterday it was $4t + 1$, to get the number of dots.
18:57	**Kirk:**	And for this problem we are not really using the x- and y-axes.
19:05	**Kirk:**	We're using the t- and d-axes, right? It's like the time is the x and the dot is the y. To answer Angel's question, nobody answered it for you.
19:17	**Kirk:**	The only answer you came up with is, it isn't related to the picture.
19:22	**Kirk:**	However, yesterday it was. Well, let's graph them and compare.
19:23	**Kirk:**	Yesterday's graph, as you recall—looked like this, didn't it? Where would today's graph—how would we graph that one? The same way? The same one?
19:49	**Students:**	No. it would be parallel, just three below though. Negative three.
19:53	**Kirk:**	It's parallel to this, but we have—our intercept you said is it negative three? But they are parallel.
20:05	**Student:**	The same slope just starts at a different point.
20:08	**Kirk:**	OK. So the question is, how is yesterday's equation similar to today's? Angel just said they have the same slope.
20:15	**Kirk:**	Are there any other similarities between today's graph and yesterday's graph?
20:20	**Kirk:**	They have the same rise over run, which is slope.

20:25	**Kirk:**	OK. They are parallels, someone said that. How are they different?
20:31	**Kirk:**	The y-intercepts are different.
20:37	**Student:**	And like the slopes . . .
20:40	**Kirk:**	Slopes are the same, y-intercepts are different.
20:43	**Student:**	One's traveling fast and the other's traveling kinda slow.
20:46	**Kirk:**	Which one's traveling kinda slow?
20:48	**Student:**	The blue one.
20:50	**Angel:**	No, they're traveling at the same speed, it's one starts behind.
20:53	**Kirk:**	He says they're going the same speed. I say that one's slow.
20:56	**Angel:**	They are. They are both going four over one. They're just one—like in a race. He got a head start and she's behind him by three.
21:07	**Kirk:**	Do you buy that? I mean, could we say that the growth rate, which is kind of like the speed of those dots growing, can we say that these two grow at the same rate?
21:21	**Student:**	Yeah, they grow at the same rate.
21:23	**Kirk:**	But, it has to do with where one minute is in our picture. So if you look at the picture up there, at one minute we have one, at two minutes we have five, and so forth.
21:41	**Kirk:**	When we slide the time, we slide the time, it affects our graph.
21:49	**Kirk:**	Now what we're going to be doing next is, we are going to slide the one minute slot to another—we're going to slide one minute to another place. OK?