Description: Ariel solving the Geese problem **Parent Tape: Early algebra: Investigating linear functions,** **Series 7 of 7: Ariel's 8th grade interview** **Date: 2007-05-017** **Location: Frank J. Hubbard Middle School – Plainfield, NJ** **Researcher: Carolyn Maher**	**Transcriber(s): DeLeon, Christina** **Verifier(s): Yedman, Madeline** **Date Transcribed: Spring 2009** **Page: 1 of 3**

1	0:00:00	**Teacher**	What do you say I give you another problem now?
2	0:02:00	**Ariel**	All right. So the geese problem A group of birds sometimes fly in a V pattern. Below you see the three smallest V patterns. Each dot represents one bird in the pattern. How many geese would be in the fourth V pattern? Right here you have, three birds, here you have five birds, and here you have one, two, three, four, five, six, seven, seven birds. So that's plus 2, plus 2. So it would be 7 plus 2 equals 9 birds in the fourth V pattern. See, like I said right here, two birds are going to be added each time so since…yeah… that's going to make the V pattern bigger. So that means there will be 9 birds… one, two, three, four, five, six, seven, eight, nine and it would continue…
3	0:01:30	**Teacher**	Right
4		**Ariel**	Cause each time its extended by one on the top. So like right here it has three, here it has two. Right here it has one only. Then over here it would have four. It would be different because if its … if there's three at stage three … stage five… wait.. hold on 1, 2,3 okay so it is stage 1 my bad… stage 1, stage 2, stage 3. Then at stage 1 it's at 3, at stage 2 its at 5… right here it'd be at 7. Then at stage 4 it'd be at 9. So it's plus two plus two, so it's going to be linear again because the first difference is the same for all of them. So then… seven.. 2x+1 and then to prove it, just substitute in say well..3. Then that'd be y=6+1 so then it'd work for any number you put in there. Y equals…Because then the pattern would be continued and each time the birds would extend two right here.
5	0:03:04	**Teacher**	Hmm. You said something about it being linear, that you knew it was going be linear. Could you prove that to me maybe using the graph paper? That is going to be linear.

6	0:03:13	**Ariel**	Oh okay. So, (grabs graph paper).(starts writing). Stage 0 stage 1, stage 2, 3, 4. Right here itd be, itd be, 3, 5, 7, 9. Intervals of 2, so you could do that.
7	0:03:37	**Teacher**	(mumbles)
8	0:03:38	**Ariel**	5, 6, 7, 8, 9. Okay so stage 1 you have 3, stage 2 it was 5, stage 3 it was 7, stage 4 it was at 9. Then it makes a straight line. Then you see that your Y intercept here is 1, So using the formula, y=mx+b. B being the slope. And then to find the slope you could do. Y-y, x-x, then just substitute some numbers in like 1 and 3 and 2 and 5. 5-3 and 2-1.. is 2 over 1 and then you just divide it equals 2 that's your slope… oh no my bad.. this would be the Y intercept.
9	0:05:04	**teacher**	The B?
10	0:05:05	**Ariel**	Yeah.. the b and the slope is m. Okay and then.. the y-intercept. Y equals 2x… and then your y intercepts up here, which is when the line crosses the y axis and its 1. Using the graph, I found out this here equation. It's linear because it's a straight line. It doesn't have...its not a parabola or anything like that. And it has equal increments by two every time.
11	0:05:40	**teacher**	So your saying that, where is it increasing by two everytime.
12	0:05:43	**Ariel**	mmm..at The y every time
13	0:05:47	**teacher**	So the little dots.
14	0:05:49	**Ariel**	Yeah. The three, then it goes to five, then it goes to seven, then it goes to nine
15	0:05:55	**Teacher**	Okay…So umm this equation here, does it match what you did on the other one?
16		**Ariel**	Mhmm,
17		**teacher**	Or is it? …

18	0:06:07		Because from the table you find it out like this you find out that its increasing by two, that's the slope which here that's what's slope is the increase or decrease depending on the situation
19	0:06:18	**Teacher**	Okay
20	0:06:19	**Ariel**	And then so, that's what your going to put in for your m… and then the y-intercept on the table you find it by... if you see that its adding 2 every time.. you see at stage 1 it was at 3 so you minus 2 you get 1 which is your y-intercept. Then you.. then y-intercept is always at zero
21	0:06:40	**Teacher**	Mhm.
22	0:06:42	**Ariel**	So x is at zero and you find your y intercept. It was different for each one.
23	0:06:48	**Teacher**	Hm… but you ended up with the same answer on both of them.
24	0:06:51	**Ariel**	Yup
25	0:06:52	**Teacher**	Interesting