Description: Clip 5: Explaining Solutions **Parent Tape: Pizza Problems with Four and Five Toppings** **Date: 1999-03-01** **Location: David Brearley High School** **Researcher(s): Professor Carolyn Maher**	**Transcriber(s): Marcelle Farhat, Elijah Brookes, Gary Wenger, Anat Even-Zahav** **Verifier(s): William McGowan** **Date Transcribed: Fall 2010** **Page: 1 of 4**

Line	Time	Speaker	Transcript
1		Dr. Maher	All of you were Able to follow it? Amy tell me what she was saying.
2		Amy	What?
3		Dr. Maher	With the towers, how this works for towers.
4	76:19	Amy	Like we had done it in one of the classes that we had in the sessions, and so we could just kind of picture what it was like I mean Bobby was drawing...
5		Dr. Maher	So so tell what I'm supposed to picture if now I'm not thinking of pizzas anymore here. I'm thinking of the same rows, can you tell what I am supposed to imagine in my head with towers?
6		Amy	Isn't like so many high and then so...
7		Dr. Maher	Ok so tell me so this (pointing to a row in Pascal's triangle) would be how high?
8		Amy	That would be three high right? Yeah.
9		Dr. Maher	Three high.
11		Amy	Three high, and then its how many colors you have.
13		Stephanie	(speaking to Amy) remember we did it on the bottom.
14		Amy	yeah
15		Dr. Maher	So
16		Stephanie	If you had blue and red.
17		Amy	If you have blue and red if you had two colors.
18		Dr. Maher	So what does the one represent?
19		Amy	One of all, like say blue, like three high of all blue cubes.
20		Dr. Maher	Mhmm ok I could imagine that, and what does the three represent?
21		Amy	You could have, like um, three towers where you have like 2 blue and one red.. umm
		Dr. Maher	So now you have...
		Amy	two red and one blue.
22		Dr. Maher	Which is it? Does it matter? If your making this(pointing to the one in Pascal's triangle) all blue, and your making this...
23	77:18	Stephanie	Oh that would probably be. I think that would be one, the way that it would work out it would be one blue (Amy and Shelly agree)and two reds and the next would be two blue and one red.
24		Dr. Maher	How many blues are here?
25		Stephanie and Shelly	All
26		Amy	three
27		Dr. Maher	So this your going from three blue to one blue

28		Stephanie	Oh I don't know
29		Shelly	Three blues to two blues
30		Stephanie &Shelly	Too one blue to none
31		Shelly	Or you could do it the other way around, with three reds
32		Dr. Maher	Ok. No reds to one red to two reds to three reds(all join here in saying three reds.) Ok, I could imagine that In my head. Ok so let's decide on one. You said the three blues so no reds one reds two reds three reds. So tell me where the 4 comes in.
33		Stephanie	ok
34		Dr. Maher	Well let Amy do it because I'm curious. Because she hasn't played with it for a long time right?
35	78:10	Amy	Yeah I guess you could say that.
36		Dr. Maher	You too, Shelly, you haven't played with this in a while so you can help me.
37		Shelly	That would be four, like four blue, three blue, two blue ,one blue, no blue. Or
38		Dr. Maher	Ok or no red
39		Shelly& Dr. Maher	No red, one red, two red, three red, four red.
40		Dr. Maher	Ok I could imagine that. So why, why does one plus three give you four? You have towers three tall now you have towers 4 tall. How does the one plus three give you the four?
41		Shelly	Because you're just adding the extra block on.
42		Dr. Maher	What are you adding on from here to here and here to here (pointing Pascal's triangle) when this is no reds, right? And this is three with one red, right? Could you see in your heads the three with one red? Can you imagine those? What do they look like, the three with one red? Can you see them?
43	78:44	Stephanie	mhmm
44		Dr. Maher	You know there are exactly three? What do you see I am curious? What do you see in your heads?
45		Amy	Blocks (all giggle)
46		Dr. Maher	How do you see the three of them with exactly one red?
47		Stephanie	Umm one with a red at the top. One with the red in the middle(other join in whispering) and one with a red at the bottom.
48		Dr. Maher	You all could imagine that?
49		Robert	Mhmm
50		Dr. Maher	Very impressive, Ok. So how do we now get these four with one red?
51		Stephanie	Umm, wait I have to think. (pulls paper closer)
52		Dr. Maher	Alright.
53		Stephanie	These are all blue, Right? And these are one blue? Is that what we're saying?
54		Dr. Maher	These are..
55		Shelly	No red.
56		Stephanie	(Laughs) So these are all blue, and these are one blue.
57		Shelly	Yeah, hehe, same thing.
58		Dr. Maher	I have to switch. I'm not as fast as you are, Stephanie. You're much more expert on these towers than I am, without having them in front of me.

59		Stephanie	Oh these are all blue, these are two blue. I'm sorry. That was...
60		Dr. Maher	Right, or no red and one red.
61	79:54	Stephanie	Ok, that was (inaudible). Yes. So here all you're doing is adding one red.
62		Dr. Maher	Ok. So this has to be a one red
63		Stephanie	Yes, so you already have, um, three with one red, so here this becomes the fourth one with one red, because here there is no reds. And each of them get a block like added to them how do I... ok.
64		Dr. Maher	I can see my little stack here and this little stack here there is only one of them and its all blue no red, right?
65		Stephanie	Yeah, where is your picture? Do you have your picture to that (speaking to Robert)? No?
66		Dr. Maher	You'll have to help me with this. Why don't you make a picture?
67		Stephanie	(grabs paper and marker) Ok. (and begins drawing) So here is, you have the one three high with all blue. Then you have the three with one red, so you have red, blue, blue; blue, red, blue; blue, blue, red. And then these two make... This one is four blues. Well, that was... (others giggle) ok and these two together make, um, the one with four, the four with one red. So this one gets a red added on because its already got three blues, so it can't have any more blues. And then these three all get a blue added on to it. (with Shelly)
68		Dr. Maher	Because they already have one red.
69		Stephanie	They already have one red.
70		Dr. Maher	Does that make sense? (looking at Robert)
71		Robert	Mhmm