

LINE	TIME	SPEAKER	TRANSCRIPT	CODES
		CM:	Okay. Yesterday you and Jeff worked and how did you work together?	
1		M:	Well, mmh, first we made a pattern and then we just tried to make, mmh, we got thirty but then I found one more and we made the opposite then so we come with thirty two and then he was, we were trying to show you that there was thirty-two so, he did make a duplicate just to show.	
2		CM:	I'm not sure I understand how you did that because you did it one way and then in order to convince me that they were exactly thirty-two no more no less, then you did something else?	
3		M:	Yeah, he made patterns to show that, and then he started taking out the duplicates.	
4		CM:	The duplicates, can you <i>(doesn't finish the sentence, but from her gesturing using hands, she seems to be telling her to explain more/continue)</i> .	
5		M:	And then we got two, then we got thirty	
6		CM:	Oh. So, do you think they are thirty?	
7		M:	I'm not sure	
8		CM:	You are not sure if they are thirty or thirty-two? Have you thought about it anymore since yesterday?	
9		M:	Well, I really think there is thirty-two	

10		CM:	Ok. Why do you think that?	
11		M:	I think that because we got thirty first, but, then we made more and then he took some, he used some that were on the side for the pattern, then two may have been on the side.	
12		CM:	Ok. Are you actually convinced or you are pretty sure or	
13		M:	I'm pretty sure	
14		CM:	Ok. Tell us some of the patterns that you did then.	
15		M:	Well, first we just started making ones like <i>this (built a YYYYY and RRRRR tower)</i>	
16		CM:	Aha!	
17		M:	And then we started making ones like this <i>(built a YYRRR tower)</i> and we started naming them in different ways of pattern	
18		CM:	So, I don't know what you mean by pattern, what did call the pattern when you made this <i>(referring to the YYYYY and the RRRRR tower)</i> .	
19		M:	Well, with the pattern we could <i>(takes a few seconds building RRRRY and RRRYR towers)</i> he made it look like steps going up.	
20		CM:	Ok. So, that would be a pattern, what kind of pattern might you call that if you give that pattern a name and could you name the pattern.	
21		M:	Mmh,	

22		CM:	Do you what to describe what it says? You have a friend who wasn't in your class when you tell him you were making patterns. How many of this are there? (<i>referring to RRRRY and RRRYR towers which are making a pattern of steps going up</i>)	
23		M:	Well, there is, you keep doing until yellow gets to the top here (<i>meaning moving the yellow cube in each step until when the last cube will be yellow, referring to the YRRRR tower</i>)	
24		CM:	Ok. And how many of those are they going to be?	
25		M:	Mmh, for the yellow?	
26		CM:	Yeah.	
27		M:	These gonna be five and the opposites	
28		CM:	You think or	
29		M:	Yeah, I think.	
30		CM:	How can you know you know or is just a question of think?	
31		M:	I think I can do, I just have to build it	
32		CM:	Ok.	
33		M:	(<i>takes a few seconds building the staircase pattern with yellow tower moving each step up from bottom to top, RRRRY, RRRYR, RRYRR, RYRRR, YRRRR</i>)	
34		CM:	You still think five?	

35		M:	Yeah.	
36		CM:	Ok. Are you absolute sure they are five or you think five?	
37		M:	Mmmh, five	
38		CM:	Five, why can't you make six?	
39		M:	Because it doesn't go higher up, you will need more unifix to make it six.	
40		CM:	Oh. So why not you just do that?	
41		M:	<i>(she builds YRRRRR tower and places it besides the last tower YRRRR in the staircase pattern)</i>	
42		CM:	Yeah. Why can't you do that?	
43		M:	Because the towers <i>(inaudible)</i>	
44		CM:	Ooh, ok, so, you are absolute sure then, that towers like this <i>(referring to the towers in the staircase pattern, RRRRY, RRRYR, RRYRR, RYRRR, YRRRR)</i> how can you describe towers like this?	
45		M:	<i>(puts the six tall tower YRRRRR aside)</i> for the red ones looks like steps going down and for the yellow ones looks like step <i>(referring to the staircase pattern towers RRRRY, RRRYR, RRYRR, RYRRR, YRRRR)</i>	
46		CM:	Ok. Let talk about the yellow ones. Let's give this a name and write what you found here <i>(referring to the pattern of RRRRY, RRRYR, RRYRR, RYRRR, YRRRR towers)</i> <i>(gives Michele a plain paper and a pen)</i> say how many you found.	

47		M:	Five (<i>writes 5 on the paper</i>)	
48		CM:	Five	
49		M:	It looks like it's going diagonal	
50		CM:	Ok. So, what's going diagonal?	
51		M:	The yellow	
52		CM:	So, the yellows? How many yellows?	
53		M:	It's five ^[DA1]	
54		CM:	Ok. In each tower	
55		M:	One	
56		CM:	One yellow diagonal, ok, so don't you write that down so that we will remember what this is in case we forget (<i>referring to the pattern of RRRRY, RRRYR, RRYRR, RYRRR, YRRRR towers</i>)	
57		M:	(<i>she writes besides 5 "1 yellow goes diagonally"</i>)	
58		CM:	So, that all what you have like this (<i>pointing at the statement that Michele has written "1 yellow goes diagonally"</i>)	
59		M:	Well, if you had more, we did direct way like this (<i>gesturing using hands to show the opposite of the towers RRRRY, RRRYR, RRYRR, RYRRR, YRRRR</i>)	
60		CM:	Ooh.	

61		M:	We did it like <i>(starts building a tower)</i>	
62		CM:	You can tell me you don't have to make it.	
63		M:	We did it the other way around, these the yellows <i>(referring to all the red cubes in the pattern)</i> and these will be red <i>(referring to all the yellow cubes in the pattern)</i>	
64		CM:	How many of those?	
65		M:	Five like these ones <i>(referring to the five towers with yellow exactly one yellow arranged as a staircase)</i>	
66		CM:	Ooh. Why don't you write that one down too	
67		M:	<i>(writes down 5 red going diagonally)</i>	
68		CM:	Ok. So, these steps are the steps with yellow and steps with red, they are a total of how many?	
69		M:	Mmh, five towers	
70		CM:	You have five? And here how many <i>(pointing on the statement 5 red going diagonally)</i>	
71		M:	Mmh, five <i>(writes five before the statement 5 red going diagonally)</i>	
72	06:20	CM:	Ok. Alright. I understand is that unless you convince me that, this is it there were no more patterns like these <i>(referring to the staircase pattern with exactly one yellow)</i> .	
73		M:	No.	
74		CM:	Ok. Did you use another pattern?	

75		M:	Yeah. I used.	
76		CM:	Tell me about it.	
77		M:	This is just one of the kinds of work we did (<i>builds YRYRY tower</i>) and then we did the other way around. We did (<i>using the tower she built YRYRY to show the opposite</i>) red, yellow, red, yellow, red,	
78		CM:	Ok. So, how would you describe that kind of work?	
79		M:	Ooh, let's say it look like different colors. It's like different colors	
80		CM:	These are different colors? This red and yellow?	
81		M:	(<i>inaudible</i>) it goes red, yellow, well goes yellow, red, yellow, red, yellow.	
82		CM:	Ok. It is skipping colors	
83		M:	Yes.	
84		CM:	Ok. So, how many can you do with the skips? Ultimate	
85		M:	Mmh, two	
86		CM:	Two? Are you sure there is no way you can make (<i>doesn't complete the sentence</i>) you said you can make another one with skip?	
87		M:	Mmh.	

88		CM:	Possible you can go (<i>pointing on the YRYRY tower</i>) start with red here (<i>pointing the bottom cube</i>) yellow, red, yellow, yellow.	
89		M:	Yeah, you could do that, you could, you will have red and yellow.	
90		CM:	Ooh you will have red and yellow. How many of these are there? (<i>referring to the YRYRY tower</i>)	
91		M:	Two.	
92		CM:	Write that down and give it a name you call it skips or ultimate or something (<i>Michele writes down (not clear what she wrote down)</i>) (<i>Maher puts aside YRYRY tower</i>) so, what else did you do?	
93		M:	We did different ones, then he (<i>referring to Jeff</i>) (<i>Michele builds RRYYY and RYYYY towers</i>) mmh, I cannot remember the patterns because I think that was the only pattern (<i>referring to the two patterns she had built, the staircase pattern with exactly one yellow RRRRY, RRRYR, RRYRR, RYRRR, YRRRR and the pattern with the skipping colors YRYRY</i>) he (<i>referring to Jeff</i>) did some other patterns though.	
94		CM:	Ok. So, you were not part of those patterns? You were not making them?	
95		M:	Well, I made some, but he (<i>referring to Jeff</i>) was making the patterns and if he found a duplicate I will, if he found one, I could have the opposite, I would have to make the opposite.	
96		CM:	Cause you made the opposites, who did the checking?	

97		M:	Well, we both did the checking.	
98		CM:	Ok. So, it looks like you didn't really have a chance to think about the other patterns yourself? Won't you like to? You know what I think? I think we should let Michele takes the work home. Would you like to do that? And you will have your own time to think about the patterns. See if you can tell us, I mean, yeah, I noticed Michele might (<i>she doesn't finish the sentence</i>), Jeff had the blocks and he was doing the thinking (<i>inaudible</i>)	
99		A:	Ooh, good work (<i>inaudible</i>)	
100		CM:	Maybe you may do his role now. Right? You can take them and you can spare time to see what you can do and you can draw them and show us?	
101		M:	Mmmh.	
102		CM:	Would you like to do that when we come back?	
103		M:	Yeah.	
104		CM:	I will be really interested in that.	
105		A:	Can I use one of them (<i>inaudible</i>) one over there. Aha this one (<i>picks the RRYYY tower</i>). How is it different from any towers that you made?	
106		M:	It has three yellows and two reds and it's not like any of them. (<i>pointing to the towers she had built earlier the staircase pattern with exactly one yellow RRRRY, RRRYR, RRYRR, RYRRR, YRRRR and the pattern with the skipping colors YRYRY</i>)	

107		CM:	In what ways is it different?	
108		M:	Well, it's just that the colors go in different ways	
109		CM:	Ok. Colors go in different ways. So, I guess you were thinking of something like the colors <i>(she picks the RYYYY and RRYYY to display the colors)</i>	
110		M:	Yeah. You need to go like this <i>(builds RRRYY, RRRRY, RRRRR and YYYYY)</i> this one goes here <i>(places the YYYYY besides the RYYYY tower)</i>	
111		CM:	Sure. So, can you describe this pattern in some ways. Let's suppose we had a fifth grader coming in your class who had never done this before and says ooh, what kind of pattern is this?	
112		M:	Ooh, this <i>(referring to the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow)</i> , it sort of looks like stairs and this one <i>(referring to a similar staircase pattern with a focus on the red cubes at the bottom most floors)</i> , just looks like stairs upside down.	
113		A:	And how is it different from the other one you worked on today <i>(she moves the towers with a staircase pattern with exactly one yellow)</i>	
114		M:	Because this one doesn't have yellow <i>(referring to the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow)</i> all here or doesn't have red all here <i>(referring to</i>	

			<i>a similar staircase pattern with a focus on the red cubes at the bottom most floors</i>	
115		CM:	What did you do if something like this happened? (<i>picks YRRRR tower from the staircase pattern with exactly one yellow and places on top of a YRRRR tower [which is a duplicate] in the pattern with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow</i>)	
116		M:	Ooh. Well we used to take it off (<i>referring to the duplicate</i>) (<i>inaudible</i>)	
117		A:	<i>(inaudible)</i>	
118		M:	Yeah.	

119		CM:	<p>You know might be the way you are writing this down (<i>points on the paper</i>) if you could try and think of a name for this (<i>referring to the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow</i>) which is different from this (<i>referring to the staircase pattern with exactly one yellow</i>) so that when you read it you remember what it meant, I'm wondering if you can study this for example (<i>referring to the YYYYYY tower</i>) and see whether there is a way of, for instance, if I cover this up (<i>covers using hands the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow</i>).ok. I couldn't see it, only you can see it and you ask me to built it and you could give me one sentence instructions, what rule, what would be your rule to tell me to build it.</p>	
120		M:	<p>Well, I could say (<i>inaudible</i>), there are six going across and looks like stairs.</p>	
121		CM:	<p>(<i>inaudible</i>)</p>	
122		M:	<p>Well, you could say that the first two ends (<i>puts its correctly</i>), the first end is all one color and the last end is just all one color (<i>referring to the RRRRR and YYYYYY towers</i>) like this (<i>points at RRRRR tower</i>)</p>	
123		CM:	<p>How did you name the colors?</p>	

124		M:	You could say at the bottom there is five yellows going across and one red and at the top you could go five reds going across and one yellow (<i>referring to the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow</i>).	
125		CM:	So, you are looking at it like this way (<i>places her hand horizontally on the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow, at the top and bottom</i>), this is what you mean by bottom and this what you mean by top?	
126		M:	Mmhmm.	
127		CM:	Suppose I wasn't thinking about it this way (<i>referring to horizontal</i>), suppose I was thinking about it this way (<i>referring to vertical</i>), how could you help me?	
128		M:	Oh, then, there are (doesn't finish the sentence)	
129		CM:	Turn it this way (<i>turns the towers such that the tops are facing Michele, and from Michele's view, left to right we have RRRRR, RRRRY, RRRYY, RRYYY, RYYYY, YYYYY towers</i>) because I was thinking about building it this way (<i>referring to vertical way</i>) starting here (<i>pointing at the first tower in the pattern RRRRR</i>)	
130		M:	I could say the first block is all red, and the second one has one yellow.	
131		CM:	How many yellow here? (<i>pointing the RRRRR tower</i>)	

132		M:	None.	
133		CM:	Oh, no yellow here (<i>pointing the RRRRR tower</i>) all red. I get that.	
134		M:	Mmh, the third one I could say there is two yellows, then three yellows, then four yellows, then all yellows.	
135		CM:	Ok. So, there are different ways you can use to give me clues to make them, when you might think about this (<i>referring to the staircase pattern of towers with all yellow, four yellow at the bottom most floors, three yellows at the bottom most floors, two yellows, one yellow, and no yellow</i>), when you talk about this, what that might be helpful to some else who could imagine how you were thinking about. That could be helpful.	
136		A:	<i>(inaudible)</i>	
137		M:	Yeah.	
138		CM:	Do you have a friend in class that you can talk to on telephone?	
139		M:	Yeah. Stephanie.	
140		CM:	Wow. That would be fun if you tell Stephanie what to do. You say, I found this pattern and I gonna tell you how to build it and see if she can build it.	
141		A:	That would be fun, then you came and tell us (<i>she doesn't finish the sentence</i>)	

142		CM:	Then she tells you her pattern and find out if you can build it. That will be kind of fun, don't you think it? (<i>M: shakes her head to agree</i>), she is going to work on this somehow too. Would you like to work together? (<i>M: shakes her head to agree</i>)	
143		A:	Each of you will go with the unfix cubes at home and then see if you could play the game with each other	
144		CM:	We gonna give you some take home. Amy will give some to take and in about two weeks we will be back because next week we cannot come back we have to be somewhere else and we also have a (<i>inaudible</i>) and then you could tell us how you keep track of what you have done. Did you do any unfix work before?	
145		M:	No.	
146		CM:	Do you remember?	
147		M:	(<i>inaudible</i>) I try to remember.	
148		A:	You were in class last year when we did last year's activities. Which ones do you remember? Do you remember any other activity?	
149		M:	Yeah. We did shirts and pants.	
150		A:	What was it about?	
151		M:	We said there was four different colors to the answer, four different colors, so you have to try and find how many pairs they were	
152		A:	Let me see how that worked	

153		M:	Like, say one yellow short (<i>picks one yellow cube</i>) and one red top (<i>picks one red cube</i>) you will have to see how many pairs they were so you have the outfit.	
154		CM:	Ooh that will be an outfit? (<i>referring to the yellow and red cubes</i>)	
155		M:	Yeah.	
156		CM:	So, let think about that for a minute, (<i>picks one red cube and one yellow cube</i>), so, make a shirt, pant problem from this (<i>referring to the one yellow and one red cube</i>)	
157		M:	Well, see there was yellow and red (<i>picks one red and one yellow cube</i>)	
158		CM:	Okay.	
159		M:	Short and yellow and red tops.	
160		CM:	Okay.	
161		M:	So, you have to see how there was, you have to go like this (<i>builds RR, RY, YY, YR towers</i>), like this	
162		CM:	Wow, neat, so, how many outfits could there be?	
163		M:	Aah, I think four.	
164		CM:	Four? Could you make me a tower problem? With yellow and red as with the shirt and pant problem? Suppose you were to give a class a tower problem, just like the shirt and pant problem, you gave me. Is it possible to make a such problem?	

165		M:	Like, say there was like, two (<i>referring to the YY tower</i>) for the first two fours, yellow for the first two fours and then two reds for the next two fours you have to see what kind of a pattern you could do (<i>aligns the RR and YY towers to have RRY Y but not stuck up</i>)	
166		CM:	So, I'm confused here, on our tower problem, with red and yellow, how many totals were the towers?	
167		M:	Five. So, they could be five towers (<i>picks a red cube and places on top the towers she had aligned without stacking it together to have tower like RRRYY</i>)	
168		CM:	Okay, you don't have to make your towers five, you can make them any size you want. You could make them any size you want, is possible to make a tower problem that is like the shirt and pant problem you just made?	
169		M:	Well, mmh, if it was two you could go like this, (<i>builds RY tower</i>) and then have another one like this (<i>dismantles the RY tower and using the same cubes, she builds the YR tower</i>)	
170		CM:	Mmh.	
171		M:	And if it was three you could go like this (<i>adds a yellow cube to the YR tower to have YRY tower</i>)	
172		CM:	Let's talk about the two, we were making towers of two.	

173		M:	You could go like this, <i>(removes the yellow cube from the YRY cube to have the RY cube)</i> , have one like this <i>(builds the YR tower and places it next to the RY tower)</i> , one like this <i>(builds a RR tower)</i> , you could just go two reds like this <i>(referring to the RR tower)</i> , and then two yellows <i>(build YY tower and places it next to the RR tower)</i> <i>(she now have from left to right RY, YR, RR, YY towers)</i>	
174		CM:	Okay.so, how will that be like short and pants that you just told me about?	
175		M:	Well, you have to match up, let say it was two red bottoms for the towers and two bottoms yellow for the towers, and then there is two red tops for the towers and two yellow tops for the towers and you have to match them all.	
176		CM:	Aha, that's very interesting, very, very interesting, so, you telling me a tower then become like an outfit?	
178		M:	Yeah.	
179		CM:	And, you are telling the short and pant <i>(pointing at the RY tower, with yellow cube for short and red cube for pant)</i> get to be like the fours of the tower?	
180		M:	Yeah.	
181		CM:	That's very interesting. I like that. Maybe you can write out the problem for me to give to the class and see if they can solve it. Will you do that? Will get a chance? This remind you; I mean this reminded you, did you liked that problem you remembered?	
182		M:	Yeah.	

183		CM:	Anything else you remember? Any other activity? That's great. Do you have anything else to ask Michele (<i>talking to A:</i>)	
184		A:	Ooh, I will be really excited if you come back	
185		CM:	Yeah. Come back and tell us more.	
186		A:	Try to think about this pattern and you and Stephanie might talk about it before you come back.	
187		CM:	Yeah. Talk on the telephone. That's great. You have very good thinking Michele. That's wonderful, well, we will pack up, we will come back in a couple of weeks I think, with more patterns. Thank you, you can get back to class I think time is up.	