1	R1	(inaudible)
2	Stephanie	So like what we did was – we were building towers of four.
3	R1	Um hm.
4	Stephanie	And we started out with towers of four made of red and green – uh – well – at the time it was blue and green, but now it's red and yellow, um, with one red.
5	R2	Okay.
6	Stephanie	And there's four ways to do that – [*Stephanie builds* $\begin{bmatrix} R \\ Y \\ Y \\ Y \end{bmatrix} \begin{bmatrix} Y \\ R \\ Y \\ Y \end{bmatrix} \begin{bmatrix} Y \\ Y \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ Y \\ Y \\ R \end{bmatrix}$.] There's four of them.
7	R2	Um hm. Okay.
8	Stephanie	And then I was asked: For each of them, without moving the one that's red
9	R2	Okay.
10	Stephanie	how many I could build with two reds. So like from this one – [*Stephanie chooses* $\begin{bmatrix} R \\ Y \\ Y \\ Y \end{bmatrix}$ *and moves the other towers to the side.*] like how many I could build with two red, but one of them has to be on top.
11	R2	Okay.

12	Stephanie	So – [*Stephanie builds.*] I built them like this. [$\begin{bmatrix} R \\ R \\ Y \\ Y \end{bmatrix} \begin{bmatrix} R \\ Y \\ R \\ Y \end{bmatrix} \begin{bmatrix} R \\ Y \\ Y \\ R \end{bmatrix}$] and like that.
13	R2	Okay. That's all?
14	Stephanie	Yeah. That's all you can build. And the same with that one. [*She chooses* $\begin{bmatrix} Y \\ R \\ Y \\ Y \end{bmatrix}$.] You can make one like that, [*She builds* $\begin{bmatrix} R \\ R \\ Y \\ Y \end{bmatrix}$.] one like that [*builds* $\begin{bmatrix} Y \\ R \\ R \\ Y \end{bmatrix}$]
15	R2	Stephanie, what – now you've changed what you're doing when you came here?
16	Stephanie	Oh. [*builds* $\begin{bmatrix} R \\ Y \\ Y \\ R \end{bmatrix}$] Wait a minute. [*Stephanie changes the tower to* $\begin{bmatrix} Y \\ R \\ Y \\ R \end{bmatrix}$] No, I'm still – uh – this time I have to build them all with the red, the two red, but one has to be in the second spot.
17	R2	Oh, okay.
18	Stephanie	And for this one, it'll be the same thing, only one has to be in the third

		spot.
19	R2	Okay. Now I've got what you're doing.
20	Stephanie	[*Stephanie builds* $\begin{bmatrix} R \\ Y \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ R \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ Y \\ R \\ R \end{bmatrix}$.] These three.
21	R2	Okay.
22	Stephanie	And then the fourth one. [*Stephanie moves the trios that she has built to the back of the table and moves the fourth tower into the front. She builds* $\begin{bmatrix} R \\ Y \\ Y \\ R \end{bmatrix} \begin{bmatrix} Y \\ R \\ Y \\ R \end{bmatrix} \begin{bmatrix} Y \\ Y \\ R \\ R \end{bmatrix}$.] And one like that [*as she places the last tower onto the table*].
23	R2	Okay.
24	Stephanie	And that's it. But, the problem is, we made um three for each one.
25	R2	Um hm.
26	Stephanie	But the thing is that there there's like duplicates of each – like – this one [*Stephanie selects* $\begin{bmatrix} R \\ R \\ Y \\ Y \end{bmatrix}$ *from the first group of three*] and this one [*the tower with the same pattern from the second group of three. Pause.*]

		This one [*Stephanie selects* $\begin{bmatrix} R \\ Y \\ R \\ Y \end{bmatrix}$ *from group one and then* $\begin{bmatrix} Y \\ R \\ Y \\ R \end{bmatrix}$ *from group two.*] *and that one. [She continues to sort the towers into pairs. The result is:* $\begin{bmatrix} R \\ R \\ Y \\ Y \end{bmatrix} \begin{bmatrix} R \\ R \\ Y \\ Y \end{bmatrix} \begin{bmatrix} R \\ Y \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ R \\ Y \\ R \end{bmatrix} \begin{bmatrix} R \\ Y \\ Y \\ R \end{bmatrix} \begin{bmatrix} R \\ Y \\ Y \\ R \end{bmatrix} \begin{bmatrix} Y \\ R \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ R \\ R \\ Y \end{bmatrix} \begin{bmatrix} R \\ Y \\ R \\ Y \end{bmatrix} \begin{bmatrix} Y \\ R \\ Y \\ Y \end{bmatrix} \begin{bmatrix} Y \\ Y \\ R \\ R \end{bmatrix} \begin{bmatrix} Y \\ Y \\ R \\ R \end{bmatrix}$ *Stephanie and the interviewers do not notice that she has made an error in groups two and five at this point.*] So really we made six. [*pause*] Okay.
27	R2	Okay.
28	Stephanie	So. Then the next question – [*She grabs some more Unifix cubes.*]
29	R1	Could we stay here for a minute? Before the next one?
30	Stephanie	Yeah.
31	R1	Um. So you started with towers of exactly one red.
32	Stephanie	Um hm.
33	R1	Okay. And you moved to make towers four tall with exactly two reds and you worked with each of these [*R1 points to each of the original four towers Stephanie had built.*].
34	Stephanie	Um hm.

35	R1	Okay. And you said something to Donna – you said: When you add another red, this red [*R1 touches the red cube at the top of the first tower.*] position stays the same.
36	Stephanie	Um hm.
37	R1	And so you can only add a red in how many places?
38	Stephanie	Here. [*Stephanie points to the cube just below the top (position two).*]
39	R1	[*reiterating Stephanie's statement and gesture*] Here.
40	Stephanie	Here [*Stephanie points to the cube two below the top (position three)*] or here [*Stephanie points to the bottom cube.*]
41	R1	Okay. And here [*R1 indicates the second tower.*] you can add a red
42	Stephanie	Here.
43	R1	Here, here, or here. [*R1 points to the top, third and bottom positions.*]
44	Stephanie	Um hm. And that's why you'll have three, like three
45	R1	Okay. So you'll get
46	Stephanie	from each.
47	R1	From each of these four you get three
48	Stephanie	Right.
49	R1	but that gives you twelve.
50	Stephanie	Twelve [*simultaneously with R1*]
51	R1	Two, four, six, eight, ten [*R1 counts the pairs of towers.*]
52	Stephanie	But they come in pairs of two

53	R1	Um. They come in pairs of two.
54	Stephanie	Um hm.
55	R1	Um. So – you divide by
56	Stephanie	By two.
57	R1	You divide by two.
58	Stephanie	to get
59	R1	to get six
60	Stephanie	Yeah.
61	R1	Because of the two duplicates. Okay. So that's in moving from
62	Stephanie	Um hm.
63	R1	four things taken one at a time to four things taken two at a time.
64	Stephanie	Um hm.
65	R1	Okay.
66	R2	Okay.
67	R1	So you were going to ask another question – but you were going to do something?
68	Stephanie	No. I was just going to keep building.
69	R1	So what would you do – be building next?
70	Stephanie	Um. Towers with three reds?