

<p>Description: Pizza problem selecting from four toppings, Clip 1 of 1: Brandon and Colin solve the problem and compare their solutions Researcher: Amy Martino Date: 3/11/93</p>	<p>Authors: Robert Sigley & Andi Gomoll Verified: Andi Gomoll & Robert Sigley Date: 10/29/14 Page: 1 of 11</p>
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Line	Time	Speaker	Transcript
1	00:37	R1	<i>(children are working quietly in pairs at their desks. Brandon and Collin have created tables to solve the “pizza problem.” They are both writing silently.)</i> Researcher 1 comes over to their group) This looks fascinating. What are you doing?
2		Brandon	Making a graph. Just like Colin. I put um peppers sausage, sausage, mushroom and peppers, pepperoni down and like one zero one zero and make a graph.
3	00:55	R1	What does that mean, one zero, one zero?
4		Brandon	Well, instead of using like peppers down or sausage down, I’m just going put like a one for like yes it’s going in and zero not on it.
5	1:08	R1	So then this first pizza has what on it?
6		Brandon	Um, peppers and mushrooms. And then you could have all or zeros.
7	1:20	R1	So what would you write for an all plain one?
8		Brandon	Zero, zero, zero, zero.
9		R1	I see. Ok I understand what you’re doing. This is very interesting. Are you doing something like that too Colin?
10	1:30	Brandon	Yea, he’s doing it similar. <i>(camera zooms in on Colin’s table.)</i>
11		R1	Okay, Colin, it looks like he did his a little differently. [Colin has checkmarks in certain boxes on his paper]
12		Brandon	Yea, that is going to be easier because I ran out of room with

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			the numbers
13	1:40	Colin	I put checks where we're going to put...[inaudible] (<i>Colin points to the check marks that show which toppings are included on a pizza. The table is set up with columns for each topping.</i>)
14		R1	I see. I would be interested though, since you both started in a different way if you Brandon continued in the way you are doing it and see if it comes out the same. Would you mind continuing that, or do you really want to...?
15		Brandon	Well, I'm going to do it my way, but I will switch it around a little bit because when I'm doing it that way I run out of room.
16	2:10	R1	Ok. Very interesting. I'll let you continue. (<i>R1 goes to listen to another group. Brandon and Colin continue filling out their tables</i>)
17		Colin	Brandon I got ten. Cause look at... (<i>pointing to table</i>)
18		Brandon	No, but what about this. Watch this. Can't you have one pepper, one sausage, one mushroom in groups of three, like that?
19		Colin	Oh yeah.
20	2:30	Brandon	See. (<i>Colin adds to his chart. The two continue working silently.</i>)
21	4:00	Brandon	Colin don't forget you can put all the toppings on one pizza.
22	4:55	Colin	How many pizzas do you have?
23	5:00	Brandon	Nine. I know I am missing some. (<i>Colin- very quietly- Yeah... I have 14, no 15. Reviewing his chart.</i>)

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24	5:55	Brandon	Colin, you can just have one of each. Colin, you can do this, one and then just straight through (<i>points to two rows on table. First row has 0000 meaning no toppings. The second row has a 1 under the column for pepperoni and 0s in all other columns. When Brandon says "you can do this one" he points to the 1 in the pepperoni column</i>)
25		Colin	I have fifteen
26	6:20	Brandon	Fifteen? Hm. (<i>Brandon finishes the new table he started</i>)
27		Colin	Yea. See look, Pepper and sausage, then pepperonis and peppers, sausage and peppers
28		Brandon	Colin, Colin, I just noticed. See how you are going like that? You can just start from the middle and work your way down and then... like this (<i>Brandon points to the check-mark table Colin has and then back to his own numerical table.</i>)
29	6:45	Colin	Oh yea, the middle (<i>Brandon takes one of Colin's drafted tables and folds it in half to allow him to add length to the bottom of his own table.</i>)
30	7:05	Brandon	(<i>writing on his table</i>) Zero, zero, one, one. You got zero, zero, one, one? Plain, plain, one, one? Yep you got plain, plain, one, one (<i>pointing to check marks on Colin's paper to show the correspondence</i>) 15, how'd you get 15?
31	7:52	Brandon	Eleven and I didn't even get the threes. Colin, I didn't even get to the threes and I have eleven. There must be more than fifteen, okay, watch (<i>continues adding to table. Colin leans over to see what Brandon is doing. At 8:40 he takes Brandon's paper from him so that he can directly compare their work. At 8:50 Brandon takes the paper back.</i>)
32	8:50	Brandon	Colin, do you have a nothing, do you have a plain pizza? You can have a plain pizza, can't you?

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33	9:00	Brandon	So that's sixteen.
34		Brandon	<i>(points his pen next to the number 15)</i> What am I missing?
35	9:16	Colin	Plain?
36	9:40	Brandon	Yea, no I got the plain one. Oh man. <i>[camera moves around and Brandon and Colin are no longer seen.]</i> There's sixteen, that's all.
37		Brandon	Okay, let's see what we got. Okay, read off yours okay? . [stopped at 10:00]
38	10:08	Colin	Okay. I have Pepperoni, pepperoni sausage...
39		Brandon	No... say like one in the beginning...and then we can just check it off <i>(Brandon begins checking which markers work so that Colin and Brandon can write.)</i>
40	10:22	Colin	Okay
41		Brandon	Okay
42		Colin	Pepperoni, pepperoni sausage <i>(Brandon is looking at his table and checking off the matches he has)</i>
43		Brandon	<i>(pointing to Colin's sheet)</i> Oh you're not including... oh okay! Okay let me see if I have... <i>(continues checking off on his sheet)</i>
44		Colin	Alright, pepperoni, pepperoni and mushroom
45		Brandon	Okay, go down the list like that <i>(points to column in Colin's table)</i>
46		Brandon	Okay so pepper, then pepper check...
47	11:00	Colin	Then mushrooms
48		Brandon	No that would be, pepper, pepper and mushrooms... <i>(locates the corresponding slots on his own table and makes check</i>

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			<i>mark.</i>) Check.
49	11:15	Colin	Pepperoni
50		Brandon	Check
51		Colin	Um, sausage and mushroom
52		Brandon	Sausage, mushroom, (<i>using fingers to follow down columns of mushroom and sausage</i>)
53	11:40	Colin	Did you have the ones that...
54		Brandon	(<i>searching table</i>) No I don't have sausage mushroom
55		Colin	Do you have the ones that you have in there?
56		Brandon	Oh wait wait! Yeah I got sausage, mushroom, cheese... Um sausage, sausage pepperoni (<i>pause. Looking over table.</i>) Yeah, check.
57	12:03	Colin	Uh, plain sausage?
58		Brandon	Yeah, plain sausage, check.
59	12:12	Colin	Um, plain mushroom (<i>camera zooms in on Colin's check mark chart</i>)
60		Brandon	Check.
61		Colin	Mushroom and pepperoni?
62		Brandon	Mushroom and pepperoni? (<i>pause as he searches his own chart</i>) yeah, check.
63	12:24	Brandon & Colin	(<i>The pair continues to look at one another's charts and find matches without talking aloud</i>)
64		Colin	Uh, everything [inaudible]
65		Brandon	Check.

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66	12:40	Brandon	I wonder if anchovy... if you could have anchovies (<i>looks at camera and grins</i>)
67		Colin	Mushroom, pepper ,sausage
68		Brandon	Pepper, sausage, mushroom...I'm not finding that
69		Colin	(<i>pointing to Brandon's tables</i>) You have two the same
70	12:50	Brandon	Um no no, that's the wrong one. Wait this is all, this is all the same (<i>pointing to two rows in his table</i>)
71		Colin	Yeah because we're merging...
72		Colin	And um sausage, mushroom, and pepperoni
73	13:07	Brandon	Sausage, mushroom, pepperoni (<i>looking through table for the match</i>)
74		Colin	Right, yeah.
75		Brandon	Oh that's somewhere up here (<i>pause as he searches his table</i>)
76	13:29	Colin	You got that one?
77		Brandon	Right. Sausage, mushroom, pepperoni...(<i>pause as he continues to search</i>)
78		Colin	Is that... do you have a double?
79		Brandon	Yeah, it must be.
80		Colin	Mushroom and pepperoni. Okay.
81		Brandon	Um, okay, go next.
82	13:58	Colin	Um, pepper, mushroom, and pepperoni. Pepperoni (<i>pointing to Brandon's pepperoni column</i>)
83		Brandon	Which one was that I didn't have? (<i>reaching toward Colin's</i>

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			<i>table)</i>
84		Colin	Um,
85		Brandon	Sausage, peppers, and pepperoni
86		Colin	Nothing
87		Brandon	I think I have it... I know I have it (<i>Colin reaches over to point to Colin's table</i>)
88		Colin	Oh there it is! (<i>Pointing to square on Brandon's table</i>)
89	14:27	Brandon	No, that's 0,0,0...
90		Colin	You had that.
91		Brandon	I know I did.
92		Colin	Oh yeah, that's it. (<i>pointing to another box on the table</i>)
93	14:35	Brandon	0,0,0,0,0
94		Colin	Yeah, that's what I mean. And you have under this (<i>attempts to flip Brandon's sheet of paper over</i>)
95		Brandon	No (<i>keeps the sheet of paper in place.</i>) I've got um 1,1,0,1. Now where's that one the sausage, mushroom, and pepperoni? Huh. Colin, can you check this sheet and see if I have doubles on that? (<i>hands his sheet to Colin</i>)
96	15:06	Brandon	Pepperoni (<i>Collin begins to check Brandon's work for "doubles." Brandon takes Colin's work and searches for "doubles"</i>)
97		Brandon	No doubles on that sheet. (<i>Camera pans away, R1 returns to the group and the camera refocuses.</i>)
98	15:20	Brandon	Okay, well the first one we had Colin went down the list and I checked off.

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99		Colin	And pepper and mushroom and mushroom and pepperoni and then we go to the next category and which would be just plain sausage, and mushroom, and mushroom and pepperoni, then pepperoni, then everything. Then pepper, sausage and mushroom (<i>pointing to boxes in table as he goes.</i>) Sausage, mushroom, [inaudible]
100		Brandon	Mushroom and pepperoni
101		Brandon	Wait, but that's double (<i>pointing to check mark at the bottom of Colin's sheet of paper. Colin crosses out two check marks on his table.</i>)
102		Colin	Okay. Wait, no it's not!
103		Brandon	Yeah, one comes here and one comes here (<i>pointing to duplicates on table</i>)
104		Colin	Pepper, mushroom and pepper,
105		Brandon	And a plain pizza.
106		Colin	Yeah.
107		Brandon	Pizza with everything.
108		Colin	Uh, yeah, right here (<i>finds pizza with everything notation on his table</i>) And
109	16:25	Brandon	Wait... where, where, where? (<i>colin points</i>)
110		Colin	And nothing, just cheese.
111		R1	Okay. Now.
112		Brandon	Here, I did, I did nothing then one pepperoni then mushroom then... (<i>pointing to his own table</i>)
113		R1	Okay so this one has one mushroom (<i>pointing to a number one on Brandon's table</i>) Okay one topping of mushroom.

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114		Brandon	Yeah, I just went down the list.
115		R1	Okay, now what I want to know is, I can't think of one in my head...like if I sit here long enough hand think about it how can you convince me that I'm not going to find another one? Can you maybe go through this...take me through this? Cause I got confused. I got confused as to how you were coming up with all of this.
116	17:08	Brandon	Alright, well first I started with all zeros, then I went to one pepper and nothing else and then one mushroom and nothing else and sausage nothing else and pepperoni nothing else. Then pepper and mushroom, nothing else. Pepper and sausage, then um pepper and pepperoni.
117		R1	Okay.
118		Brandon	Then I went two on all. I went mushroom and pepperoni, and then mushrooms and sausage, and then I went the third one and got sausage and pepperoni and that's it.
119		R1	Why [inaudible]
120		Brandon	Cause I'm going da-duh da-duh da-duh (<i>moving across table in diagonal motion</i>)
121		Brandon	Cause once I'm right there I can't put the double. So then after I do that I went to a group of three and went pepper um pepper, mushroom, sausage and pepper, sausage, pepperoni...pepper, mushroom, and pepperoni. Then um pepper, mushroom and pepperoni and then mushroom, sausage, and pepperoni.
122	18:30	R1	Let me see if I understand. Okay. Parts of it. I can really very clearly see all the ones with one topping, right? (<i>pointing to first several rows in Brandon's table</i>) Okay, but then what happened? Did you do ones with two toppings then?

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123	18:45	Brandon	I went to two toppings. Here's two (<i>pointing to two numbers on his table with his fingers,</i>) there's two, then there's two. Then I went to the second row and went two, two. And then the third row two... and that's all I could have.
124		R1	Then what'd you do?
125		Brandon	Then, since there's 4 right there, I went into three and then pepper, mushroom, sausage. Pepper, sausage, pepperoni. And um pepper, mushroom, pepperoni. And then got a pizza with everything because that's the last one you can um put with three except that's the last one you could have with three and then all of them.
126	19:40	Brandon	[inaudible] and then he [Colin] said one that I noticed I didn't have so I took one, he took the other, and then he found out I had doubles. So then I put it down and I got all of them.
127	19:53	R1	I see. So those two were added on.
128		Brandon	Well, this one was added on
129		R1	Which one?
130		Brandon	This last one
131		Colin	(<i>pointing to last rows in Brandon's table</i>) This one was gone (<i>crosses row out with marker</i>)
132		R1	Oh I see so that one was gone, I'm not supposed to look at that one, and this one (<i>pointing to last row</i>) was added on.
133		R1	That one you added on... You have a very nice a very nice system here. Where would that have gone? Can you show me where that would have gone?
134		Brandon	Oh it would go, it would go right here. See 1,2,3, so it goes somewhere around here. Yeah right here (<i>points to specific</i>)

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			<i>spot on table.</i>) Yeah it would go right here because that's 0.
135		R1	Okay, so you put it like right between 11 and 12 [row number]
136		Brandon	Yeah, right between 11 and 12.
137		R1	Interesting. This is very neat. You know what I want you two to do? I want you to um take this one that you've done Brandon here, and I want you to copy it on a big piece of paper so that we can share this.
138		Colin	Okay.
139		Brandon	With Colin's, right?
140	10:50	R1	Well you can just do one if you want to contribute.
141		Brandon	Nah, let's do both.
142		R1	You want to do both? Okay. Let me get you some paper.
143		Brandon	Colin (<i>the two do a 2-step high five</i>)
144		R1	Okay, patience everyone
145			
146			
147			
148			