Description: Wondering about how to combine terms **Parent Tape: Early Algebra Ideas About Binomial Expansion, Stephanie's Interview One of Seven** **Date: 1995-11-08** **Location: Harding Elementary School** **Researcher: Professor Carolyn Maher**	**Transcriber(s): Aboelnaga, Eman** **Verifier(s): Yedman, Madeline** **Date Transcribed: Fall 2010** **Page: 1 of 4**

1		R1	Let's see if we can make this simple. So we said so far that possibly x plus y times x plus y, right?
2		Stephanie	Um hm.
3		R1	Could be thought of as x x plus y's right? Plus y x plus y's.
4		Stephanie	Yeah.
5		R1	You like that?
6		Stephanie	Yes.
7		R1	Now let's – um – could you make this simple with your Distributive Law?
8		Stephanie	Yes.
9		R1	Do you think you can – do you know enough – what does it mean to write x times x plus y?
10		Stephanie	Oh. Can I - - ?
11		R1	What does that mean: x times the quantity x plus y?
12		Stephanie	Well, x times – no. Wait. That's – It – See if it was just x times x I could do an x-squared.
13		R1	Well, it is. You have x times x.
14		Stephanie	Yeah, but I can't do it with y, 'cause y-squared is different than x-squared.
15		R1	Okay. But this piece you think is x-squared?
16		Stephanie	I can do it.
17		R1	x times x.
18		Stephanie	Yeah.
19		R1	Well, do that.
20		Stephanie	It would just be – do you want me to write x times x or x-squared?
21		R1	x-squared.
22		Stephanie	x-squared, okay.
23		R1	Okay.
24		Stephanie	But here it would be x to the y power.
25		R1	Let's think about that. What are you saying here? You're trying to guess what x

			times y is, right?
26		Stephanie	Yeah.
27		R1	So let's get a paper to conjecture. You can conjecture here.
28		Stephanie	Okay.
29		R1	How do you think you would write – what do you think it means 'x times y'?
30		Stephanie	Well, it's an um x amount y number of times or y amount x number of times. It can go either way.
31		R1	So. Well. Look at what you just wrote.
32		Stephanie	Um hm.
33		R1	Do you think that's a way to write it?
34		Stephanie	Well, yeah. You can write it like that. I'm just saying –
35		R1	Yeah. That's fine. I like it that way. Okay. [Stephanie writes: $x^2 + x \cdot y + y \cdot x + y^2$]
36		R1	Okay. So you see why your other guess didn't work before? If what you're doing is right – there's your x-squared, there's your y-squared, but there's something else.
37		Stephanie	Yeah. I understand.
38		R1	See that. What is that something else?
39		Stephanie	It's the x times the y.
40		R1	Or – what's next?
41		Stephanie	Or the y times the x. Or –
42		R1	Okay. So you have this xy and you have this yx, right?
43		Stephanie	Um hm.
44		R1	Can you simplify that?
45		Stephanie	Yeah. I can get – Could I – Now if I added another x there, it could be x to the third, right? Could I do –
46		R1	Now I'm confused. Let's think what you're doing here. So –
47		Stephanie	Alright. Because then – alright – it would

			be x plus x plus x plus – just so that it's easier for me - - y plus y plus y-squared. [Stephanie writes: $(x^2 + x + x) + (y + y + y^2)$]
48		R1	So you're conjecturing that this is the same as this?
49		Stephanie	Yeah. Because you're just putting all the –
50		R1	Let's try it with numbers and see if that makes sense – what you're conjecturing.
51		Stephanie	Alright.
52		R1	What does that mean?
53		Stephanie	That means like –
54		R1	Try some numbers. Try easy numbers. [Stephanie writes: $(2^2 + 2 + 2) + (3 + 3 + 3^2)$]
55		Stephanie	And that's two squared, that's four, plus two, six, eight, plus three, plus three, that's six, plus nine is fifteen. That works! [she writes: 8 + 15] No. It doesn't. That's twenty-three.
56		R1	That gives you twenty-three
57		Stephanie	Yeah.
58		R1	So something isn't working here, huh?
59		Stephanie	No.
60		R1	So that might not be a valid step.
61		Stephanie	No.
62		R1	Okay. So. I'm kind of curious. What did you want to do with this thing here?
63		Stephanie	Well, because – well – when we add the um-
64		R1	You have x-squared plus xy plus yx plus y-squared.
65		Stephanie	It was just putting the terms together.
66		R1	What terms were you putting together?

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67		Stephanie	Well, the x and the –oh. Is it that maybe I can't put the x's with the x-squared, 'cause they're two different terms? Would that make a difference?
68		R1	Okay. Where's the x?
69		Stephanie	Right here and here. [points to the xy and yx]
70		R1	But is this an x?
71		Stephanie	No. It's x times y, actually. (inaudible)
72		R1	(inaudible) Sure.
73		Stephanie	So this is (inaudible).
74		R1	(inaudible) change your mind in that one, huh? Okay. So this is x-squared plus, this is an x.