

Description: Clip 6 of 9: Explaining the algebraic and geometric representations of $(a+b)$ squared and the algebraic expansion of $(a+b)$ cubed to observers Parent Tape: Early Algebra Ideas About Binomial Expansion, Stephanie's Interview Four of Seven Date: 1996-02-21 Location: Harding Elementary School Researcher: Professor Carolyn Maher	Transcriber(s): Aboelnaga, Eman Verifier(s): Yedman, Madeline Date Transcribed: Fall 2010 Page: 1 of 2
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0:00	1	R1	Does anyone have any questions? Anyone back there? Did you all...? 'Cause you all can come close and I think she'll show you now.
	2	Stephanie	Do I have to start with a plus b ? Squared?
	3	R1	You've gotta start with where they are-
	4	Stephanie	Do I have to start with a plus b quantity squared?
	5	R1	You may have to start with the very basic-
	6	Stephanie	Alright.
	7	R1	Feel free to ask Stephanie questions.
	8	Stephanie	Alright [<i>begins writing</i>]. a plus b , quantity, squared, is a plus b , times a plus b . Right? Okay. So, if I were to like, draw it as a square, like [<i>begins to use 10x10x1 box</i>], if this were- this is a square, and say that, well [<i>draws a square</i>] if that was a square, and that piece is a [<i>divides square in drawing</i>] and that piece is b [<i>labels drawing</i>]. Okay? [<i>Divides in other direction, labels</i>] That piece is a , and that piece is b . Okay, so, each, like, little section, like, has its own area. And it would be [<i>labels drawing</i>] a squared [<i>trails off</i>]. So, you understand that?
	9	R3	Yes.
	10	Stephanie	Okay. So then a plus b squared would be a squared, plus ab , plus ab , plus b squared [<i>points to diagram</i>]. Or, a squared plus two ab , plus b squared. Okay?
	11	R3	Mhm.
	12	Stephanie	So then, um, [<i>begins to write on new paper</i>]
	13	R3	What is that ab ? The a squared was a square, and the b squared was a square, (inaudible), what was the ab ?
	14	Stephanie	Oh, it's a rectangle.
	15	R3	Oh, okay.
	16	Stephanie	So [<i>resumes writing</i>] a plus b cubed. a plus b quantity cubed, which is the same thing as [<i>writes</i>] a plus b , quantity a plus b , a plus b . But we already know that quantity a plus b times a plus b is a plus b squared, or [<i>writes</i>] a squared, plus $2ab$, plus b squared. Right?
	17	R3	Right.
	18	Stephanie	So... You'd have to multiply that times [<i>writes</i>] the other a plus

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			<i>b</i> . Right?
	19	R3	Okay.
	20	Stephanie	So... It would be <i>a</i> squared [<i>writes</i>] times <i>a</i> plus <i>b</i> , which is- <i>a</i> times <i>a</i> squared is <i>a</i> to the third- plus <i>a</i> squared times <i>b</i> , which is <i>a</i> squared <i>b</i> .
	21	R4	How did you get that? How did you get from one step to the other? How'd you go- Where'd you get that <i>a</i> squared from?
	22	Stephanie	Oh-This <i>a</i> sq- Oh-
	23	R4	Yeah.
	24	Stephanie	'Cause you're multiplying it by <i>a</i> squared.
	25	R4	Okay. Let me see. [<i>turns paper around to see</i>] So you have <i>a</i> squared plus <i>2ab</i> plus <i>b</i> squared, oh okay, that's <i>a</i> squared, and then you're multiplying it by that <i>ab</i> , quantity <i>ab</i> .
	26	Stephanie	Yes.
	27	R4	Oh, okay.
	28	Stephanie	Okay. So then it would be [<i>resumes writing</i>] <i>2ab</i> times <i>a</i> plus <i>b</i> , which is, <i>a</i> times <i>2ab</i> is 2 <i>a</i> squared <i>b</i> . And <i>b</i> times <i>2ab</i> is 2 <i>a</i> <i>b</i> squared. Ahem. Plus... um... <i>b</i> squared times <i>a</i> plus <i>b</i> , which would be <i>a</i> times <i>b</i> squared is <i>ab</i> squared, plus <i>b</i> times <i>b</i> squared, which is <i>b</i> to the third. And that can be simplified. [<i>pause</i>] That can be [<i>writes</i>] <i>a</i> s- cubed plus you can – ahem- <i>a</i> squared <i>b</i> plus 2 <i>a</i> squared <i>b</i> is [<i>writes</i>] 3 <i>a</i> squared <i>b</i> . Plus 2 <i>a</i> squared- 2 <i>ab</i> squared plus <i>ab</i> squared is 3 <i>ab</i> squared plus <i>b</i> to the third. And that's [<i>turns paper to show work</i>]- can't be simplified anymore, so that's the same thing as- um- [<i>writes</i>] <i>a</i> plus <i>b</i> quantity cubed. And then- ahem- we- [<i>pause, flips through papers</i>] So then if you were gonna use these [<i>places Algebra blocks on table</i>] to show this, um, we'd start out with the two dimensional figure, which was [<i>retrieves paper</i>] <i>a</i> plus <i>b</i> quantity squared.