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| Description: Working with Larger Ribbons and Bows (presentation view) Date: 1993-12-14 Location: Colts Neck Elementary School Researcher: Professor Carolyn Maher | Transcriber(s): Yankelewitz, Dina Verifier(s): Yedman, Madeline Date Transcribed: Spring 2009 Page: 1 of 9 |
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| Line | Time | Speaker | Transcript |
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| 16.1.1 | 00:07 | T/R 1: | Now, I know Beth wasn't here, she's, she's, I... I understand that umm she knows about the activities some people have shared, uh... but uh, let's see what can we tell Beth about what we did last time? Any, any discoveries that we made in our project? Anything we remembered about making these ribbons that would be an important kind of thing to have noticed? Jessica? |
| 16.1.2 | | Jessica: | Well, I noticed that after a while like it started making a pattern. |
| 16.1.3 | | T/R 1: | Ok. You want to say a little bit more about that? |
| 16.1.4 | | Jessica: | Well, um, I forget what pattern but I think it was going like it started going in three, six, nine, like... like when it said when you had like different size ribbons and every time it got like ...like three times bigger and it kept doing it in all different kinds of patterns, I thought. |
| 16.1.5 | | Michael: | Yeah, because at first it went two, three, four, five |
| 16.1.6 | | Jessica: | And then it went... |
| 16.1.7 | | Michael: | and the second one went, uh, the second one went four, eight, something like four, six, yeah |
| 16.1.8 | | T/R 1: | I don't remember any two, four, six or four, eight. |
| 16.1.9 | | Michael: | No, it's four, it's four, six, eight, ten... and then there was that odd, and then there was that two thirds one. |
| 16.1.10 | | T/R 1: | Ok, let's, let's, let's hold out... Brian what were you just saying? |
| 16.1.11 | | Brian: | Well, if we, remember we had the three meters, you would always like times the number by three. Like you go three, six, nine? |
| 16.1.12 | | T/R 1: | Yeah, yeah Michael's asking the question I had which number. Let's use that as an example. I have ribbons three meters long and I'm making bows how long? For example. Michael? |
| 16.1.13 | | Michael: | Uh, one half |
| 16.1.14 | | T/R 1: | One half a meter long, so if I have, I could sort of imagine ribbon three meters long, three of these sticks long, that's how long, and I'm making bows a third of a meter long, how can I imagine a third of a meter? How could I imagine one third of a meter? You could imagine a meter, right? |

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You can see a meter? How can you imagine a third? Can you all in your heads imagine a third? How many of you can, imagine a third? So what are you imagining when you imagine a third? Not everyone is imagining it. Beth, what do you imagine?

16.1.15 Beth: [hems and haws]

16.1.16 T/R 1: Is it longer than this? No? Is it shorter than this? [students yeah] Is it shorter than this length?

16.1.17 Beth: Uhh huh.

16.1.18 T/R 1: Ok, so it's shorter than this length. About how short, much shorter is it than this length? What are you imagining? You're the only ones who can imagine how much shorter it is? I think more of you can imagine. Can you imagine a third of a meter? I have some half hands up. Jessica, what do you imagine?

16.1.19 Jessica: Well, I imagine if you like pull the ruler into like three pieces and then it would be like, like, up to the um I think wait, um thirty-three mark, I think.

16.1.20 T/R 1: Well how, how did you decide on the thirty-three mark?

16.1.21 Jessica: Well that's what I think because um, um, thirty-three plus thirty-three plus thirty-three is ninety nine and that's,

16.1.22 Michael No, but there's a hundred...

16.1.23 Jessica Yeah, and then a hundred, around like thirty three and like a half almost.

16.1.24 T/R 1: What do you think? Jackie, your hand up partially?

16.1.25 Jackie: Something around.

16.1.26 T/R 1: Something around that.

16.1.27 Alan: I think there, it's thirty-three and one third because if you take two more thirds you can get it to a hundred.

16.1.28 T/R 1: What do you think, Jessica? Thirty-three and a third?

16.1.29 Jessica: Yeah.

16.1.30 T/R 1: That what you're imagining, so this...

16.1.31 Michael: I'm, I'm imagining it just being cut into three equal halves

16.1.32 4:53 T/R 1: Equal parts. Three equal parts. How many of you imagined it cut into three equal parts? [many hands raised] Ok, and Jessica and Alan were a little more explicit they were trying to actually tell me the... how long those parts are, right? And uh, and so you're telling me in this meter stick, because there...you're telling me there are a hundred

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- meters here? A hundred centimeters here? A hundred what here?
- 16.1.33 Students A hundred centimeters...
- 16.1.34 T/R 1: A hundred centimeters? How do you know that?
- 16.1.35 Alan: Because it only goes up to ninety-nine but there's an extra length that could be a centimeter.
- 16.1.36 T/R 1: This piece over here?
- 16.1.37 Alan: Mmm hmmm.
- 16.1.38 T/R 1: I see, the numbers go to ninety-nine but it goes up to here, you're telling me. So you're telling me there are a hundred centimeters here and you're telling me that if you were to make three equal parts, Graham, what do you think?
- 16.1.39 Graham: Well, there's ten decimeters.
- 16.1.40 T/R 1: Ten decimeters, well.
- 16.1.41 Graham: Well, that's ten centimeters, and then there's ten decimeters.
- 16.1.42 T/R 1: How do you get ten decimeters?
- 16.1.43 Graham: Well there's, well there's ten centimeters in a decimeter and there's ten of them on that so it would go to a hundred.
- 16.1.44 Michael: What? Ten centimeters, plus ten centimeters, plus ten centimeters is [inaudible]
- 16.1.45 Graham 10 times
- 16.1.46 Michael Oh.
- 16.1.47 T/R 1: Ten times ten? Very interesting. Let's talk about that another time, what Graham is saying. Um, but, for now, you, you all can imagine a third? So what was the question that you posed to me? If we had three meter length ribbon is that what you said earlier, Brian? And we wanted to know how many ribbons one third of a meter long? And what did we decide? How many? We're going to hear Jessica's theory now.
- 16.1.48 Jessica: Um
- 16.1.49 T/R 1: We had three meters; I can imagine three of these, now I could imagine a ribbon a third of a meter, right? You helped me with that and in fact you were very precise about helping me with that, and how many bows can you make?
- 16.1.50 Jessica: Um, I think you could have made, um, oh I forget, um,
- 16.1.51 T/R 1: Why don't you all sit and talk to your partner for a minute and confer and see what you think.
- 16.1.52 Jessica: What do you think, I think [inaudible]

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- 16.1.53 Beth: How many [inaudible]
- 16.1.54 Laura: I think it's nine
- 16.1.55 Jessica: I forget what I wrote on my paper.
- 16.1.56 Laura: Three meters, so...
- 16.1.57 Jessica: Yeah you can make three bows.
- 16.1.58 T/R 1: We have three meters of ribbon, and we're making bows, we have three meters of ribbon to start with and our bows are to be one third of a meter in length. How many bows can I make from three meters of ribbon? [students begin to work in groups, very little is audible on this camera view]
- 16.1.502 T/R 1: Ok, I wonder if I could ask you to give me your attention for a moment. We have only a few minutes left I know you've been working very very hard, I know there have been some wonderful thinking and wonderful mathematics going on, I have some questions that may be. Ok, let's start with some things that I know we all know the answer to, you can answer it together if you all stop what you're doing for a moment we'll have more time to finish. First question, three meters of ribbon, how many bows one third of a meter in length can we make? Class.
- 16.1.503 Students: Nine.
- 16.1.504 T/R 1: Does anybody disagree? You're all absolutely convinced? How many of you are convinced? How many of you can prove it? How many of you know how to prove it? Ok, that looks like everybody, I think, Danielle, is your hand up? Your hand is not up. So Danielle, you don't know how to prove it?
- 16.1.505 Danielle: Kind of.
- 16.1.506 T/R 1: Kind of over here? Kind of. Sarah, how would you prove it?
- 16.1.507 Sarah: Um, you go three-
- 16.1.508 T/R 1: Nice and loud so they can hear you. We're listening to the proof, gentlemen.
- 16.1.509 Sarah: You go three plus three plus three and that would equal nine. And
- 16.1.510 Jackie: Or three times
- 16.1.511 Michael: That's why because you have three meters and take... and you have three one thirds in each meter so three, three threes, and that equals nine.

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- 16.1.512 49:05 T/R 1: Jackie, Danielle, does that make any sense?
- 16.1.513 Jackie: I think it's three meters times three meters equals nine meters.
- 16.1.514 T/R 1: Danielle, do you agree or disagree?
- 16.1.515 Danielle: Yeah, that's what I did.
- 16.1.516 T/R 1: You think that's a good idea.
- 16.1.517 Michael: Well, you can times it, but you can add it too.
- 16.1.518 T/R 1: What confuses me is that you don't have three meters, you have a third of a meter, so you're telling me that you multiply by three. So how did you do this? What are some ways of doing this?
- 16.1.519 Michael: Three times three.
- 16.1.520 T/R 1: So you-, I'm asking you three meters of ribbon, and I'm making bows, I'm dividing it into one third meter length bows, and you're telling me that I can do that answer by multiplying it three times three and getting nine. How many of you did it that way? You said three divided by a third gave me three times three or nine? [some students raise hands] Some of you did it differently, some of you said three divided by a third is equal to three plus three plus three or nine? How many of you did it that way? A couple of you did it that way. How many of you did it the first way? Some of you raised your hands for one way, and only a couple- how many of you did it a different way then? How many people measured it out? How many of you took nine meters of ribbon and measured it out? [other hands raised] And how did you do it, to convince yourself, uh, yes? Erin?
- 16.1.521 Erin: Uh, we took string and went out in the hallway and measured the nine meters out.
- 16.1.522 T/R 1: So, you measured out nine meters, and how did you get umm, how did you measure out nine? You measured nine bows or nine meters?
- 16.1.523 Erin: Nine meters.
- 16.1.524 T/R 1: I'm confused, we started with three meters.
- 16.1.525 Erin: Ok, um, I didn't have to um measure it out.
- 16.1.526 T/R 1: You didn't have to measure that one, so that one you had the three meters, and what did you, what was the question

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- you were asking, you didn't have to measure it, so how did you do it?
- 16.1.527 Erin: Um, I did the first way, umm, three times three.
- 16.1.528 T/R 1: How did you know to multiply it three times three?
- 16.1.529 Erin: [laughs]
- 16.1.530 T/R 1: Do you understand my question, how did you know to multiply three times three? Jackie?
- 16.1.531 Jacqueline: Well, well, see, we had three meters so you put three down, and you're trying to divide it into thirds so you put another three down and then you times it and that would equal up to nine.
- 16.1.532 T/R 1: Ok, so you're telling me that in the one meter, you have three thirds, is that what you're telling me?
- 16.1.533 Jacqueline: Mmm hmm.
- 16.1.534 T/R 1: How many of you did it that way, in one meter you have three thirds so in the nine meters you have a total of nine thirds - you have three one thirds, another three one thirds, and another three one thirds. You didn't do it that way.
- 16.1.535 Jacqueline: No, I'm trying to think.
- 16.1.536 T/R 1: Did anybody do it that way? I'm confused how you got your answer. I'm so confused. Andrew?
- 16.1.537 Andrew: Well, me and James did three times three like that and we got the three and three because, um, you eventually have three meters and so one third, three, so you have three thirds of a meter so that's three thirds of a meter, so that's three times three meters equal nine meters, nine meters. Yeah.
- 16.1.538 T/R 1: Ok, maybe, maybe... James? Do you agree with that?
- 16.1.539 James: Yeah.
- 16.1.540 T/R 1: Anybody else? Maybe we should move on to the next question. Now we have nine meters of ribbon and bows are a third of a meter. Is that when you measured it in the hall, Erin?
- 16.1.541 Erin: Yeah
- 16.1.542 T/R 1: So tell me what you did in the hall? You had nine meters of ribbon.
- 16.1.543 Erin: Umm, and we measured it out, and um,
- 16.1.544 T/R 1: So what did you do out in the hall we couldn't see you [Erin laughs] What were you doing out there?
- 16.1.545 53:27 Erin: Well, um,

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- 16.1.546 T/R 1: So what's the question you measured out nine meters out there, and you're making bows, how long were the bows?
- 16.1.547 Erin: One third.
- 16.1.548 T/R 1: One third. Did you have one third meter string?
- 16.1.549 Erin: Yeah.
- 16.1.550 T/R 1: And how many of those one thirds?
- 16.1.551 Erin: Twenty-seven
- 16.1.552 T/R 1: There were twenty-seven of them. You measured it out, that's really neat. Anybody else measured it out like that? I saw some other people out in the hall measuring. In fact, we lost some people. Did you measure it out like that? What did you do, Mark?
- 16.1.553 Mark: Well, we measured out um, yeah we measured twenty-seven meters.
- 16.1.554 T/R 1: You ended up with twenty-seven of them?
- 16.1.555 Mark: Yeah, we...
- 16.1.556 T/R 1: Twenty-seven of those one thirds? And I know David and Erik you did something like that too.
- 16.1.557 Erik We did, we did it with Erin, we did it with Erin
- 16.1.558 Graham: We did it with twenty-seven meters
- 16.1.559 T/R 1: Ok, so you said to me that nine divided by one third, right, when you measured it out you found out that that was twenty-seven, and some of you did it differently. Who did it differently, without measuring it? Those of you who did it without measuring it, Sarah, what did you do?
- 16.1.560 Sarah: We timesed.
- 16.1.561 T/R 1: You said nine divided by a third is the same as nine times three?
- 16.1.562 Sarah: Yeah, and then,
- 16.1.563 T/R 1: Or twenty-seven
- 16.1.564 Sarah: Yeah and then we kept on timesing by three whatever the answer was.
- 16.1.565 T/R 1: Ok, I know that time is running out but I have this other question I want to ask you. Um, when you have nine meters of ribbon, I think Erik and David did this, and now we're making our, our ribbons three meters in length, not one third of a meter in length. Do you understand my question? How many bows can you make?
- 16.1.566 Erik: We're using nine meters, right?

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- 16.1.567 T/R 1: You have nine meters of ribbon and now your bows are three meters in length.
- 16.1.568 Erik: Ok, you have nine meters of ribbon and your bows are three meters in length. If you have wait, yeah, if you have three meters all you have to do is multiply three times three and you get nine meters because you, if you have if each...
- 16.1.569 T/R 1: Ok, so how many can you make?
- 16.1.570 Erik: You can make three, three bows
- 16.1.571 T/R 1: So you're saying if I have nine meters and I'm making them three meters in length we could make three bows.
- 16.1.572 Erik: Yes.
- 16.1.573 T/R 1: What do you think, class? David?
- 16.1.574 David: I think the same thing, because, um, if each one takes up like a meter, um, nine divided by three, that, that would be three ribbons.
- 16.1.575 T/R 1: Each one takes up three meters.
- 16.1.576 Erik: Yeah, each one takes up three meters.
- 16.1.577 David: Oh, yeah, wait a minute, um, it would be, it's like three times three would equal nine so uh nine divided by three equals three, um, [laughs] it's just because if you have three plus three plus three so you can if each one takes up three meters then you can make three bows out of nine. Because you have three meters and then, um, alright one bow would take up three so there'd be six meters left another bow would take up three so then there would be uh three meters left and then there'd be a third one and there wouldn't be, there wouldn't be any ribbon left.
- 16.1.578 T/R 1: Alright, I don't, I don't know the way the rest of you think about that. Do you agree with that? If you have nine meters bow and the three meters in length, you could make three of them. I think we have to stop now. What I'd like you to do, many of you did different things, right? I would like you to write to us and tell us what you did and why you did it. I also would like, particularly, the table of Beth, Jessica, Laura, Kimberly and Alan to write up your, why your rule works. As best as you can explain why your rule works. Ok? So if you're using a particular rule of multiplying, if you can explain to me why that works, we're going to share that tomorrow, we're coming back tomorrow, and we can

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16.1.579 Erik: start sharing, so whatever you did to get your answers, I want you to write up a story to us to explain it to us. That's your assignment. What you did and why.

16.1.580 T/R 1: So whatever answer you did? Whatever answers you did.

16.1.581 57:22 And how. How you did it.
[End of Class]