

Description: Placing Fractions on the Number Line, Clip 5 of 5. Parent Tape: Fraction problems: Sharing and Number Lines Date: 1993-11-01 Location: Colts Neck Elementary School Researcher: Professor Carolyn Maher	Transcriber(s): Schmeelk, Suzanna Verifier(s): Cann, Matt Date Transcribed: Spring 2009 Page: 1 of 11
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Line	Time	Speaker	Transcript
1	00:00	RT1	How many of you have ever used a number line before?
2		RT1	Have you placed numbers on the number line before?
3		RT1	How about putting whole number on the line. If that were zero and this were a one.
4		RT1	Where would I put two? You know where I would put two? David?
5		David	Ohm. Over there. [<i>RT1 draws line from 0 to 2 with a continuing arrow.</i>]
6		RT1	Where would you put three?
7		David	Further over.
8		RT1	Do you know where you would put four and five? Do you all see that? How many of you have done that before? You made a number line and placed the numbers on the line?
9		Class	[<i>Many students in camera view raise their hands.</i>]
10		RT1	You could imagine that number line? You could mark zero, one, two, three, and four? Where would you put a thousand? Where would a thousand be on that number line? Can you imagine that? How many of you can imagine where a thousand would be? Where do you think it will be? Would it be in the building?
11		Class	[<i>mumbles no</i>]
12		RT1	Would it be outside the building?
13		Class	[<i>Giggles yes</i>]

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14		Alan	You'd be all the way to Pittsburg, Pennsylvania.
15		RT1	You think that far. So you remember how to do those number lines, right? I bet when you did number lines before you didn't place numbers between zero and one, did you?
16		Class	[<i>mumbles no</i>]
17		RT1	Is that right? You didn't place your numbers between zero and one when you made your whole number line. Do you see the difference in what we are doing now? We're now sort of looking at other pieces of the number line. Now Alan is going to share with us his piece of the number line between zero and one. He is going to talk about it so I would like for you to listen. I see some interesting questions have arisen. [<i>Alan walks up to the OHP in the front of the room.</i>]
18		Alan	About the 1/100. I think.
19		RT1	Let's talk about the other ones first.
20		Alan	Well, between zero and one you can divide it into those fractions. Such as the three fourths would go there [<i>motions to half way between 1/2 and 1</i>] because you would have the one third there, and place one fourth there. And, it would take three of those [<i>motions to 1/4</i>] to get up to that mark. The one half you could use a guideline. The others, one tenth, one one-hundredth, and one one-thousandth.

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21		Alan	I made another [<i>points to an enlarged portion of the top number line</i>] because you couldn't really see it on the other [<i>top number line</i>] That is where the one thousandth would be. You couldn't really make anything bigger than that because it would be too hard to see.
22	02:50	RT1	Leave that up there, Alan. I want you to stay up there for a minute. Some people made their number line where they took one third and they had one third to the right of where you placed one half. How many of you have that on your number line where you have one third to the right of one half?
23		Class	[<i>Some students raise their hands.</i>]
24		RT1	I'd like to have a discussion because enough of you did that and enough of you didn't do that and we had some differences that I'd like to discuss. Some of you put one third in two places. Do you all know what I am saying? Some of you had the one third where Alan has it and then some of you also put one third on the other side of one half. What do you think about that? Alan?
25		Alan	You could put basically the one third in any place, in any three places of that number line because you could have the thirds going either way. I mean, you could take it out from there, you could take it out from there, or you could take it out from there. It really doesn't matter. So you

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			really could put it in three different places.
26		RT1	Do you agree? So where would a second place for that one third be?
27		Alan	The second place for that one third would be somewhere up here approximately [<i>points to the right of one half</i>]
28		RT1	Where would you put two thirds?
29		Alan	Two thirds would go right there [<i>motions to same location of where said a 1/3 would go.</i>]
30		Alan	Because, if you have thirds you would be dividing that into three parts so you could put it in three different places.
31		RT1	I'm not clear. So you are saying you could put one third in a second place. How are you comparing the places where you put the second one third and the two thirds?
32		Alan	If you use the rods to sort of bracket like this.
33		RT1	Let's do that.
34		Alan	Here you have thirds. [<i>Puts rods on OHP – 1 green and 3 reds</i>]
35		RT1	Let me just sketch this if you don't mind.[<i>marks 0 and 1 on OHP along the green rod. and marks the lengths from the three red rods.</i>] I'm asking you to mark one third; but, remember where I marked zero and one with respect to where I marked my zero and one.
36		Alan	You could mark the one third here

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			<i>[first tick mark]</i>
37		Alan	or you could mark it between here <i>[second tick mark]</i>
38		Alan	or you could mark it here <i>[on top of the 1]</i>
39		RT1	So place the number one third on that number line.
40		Alan	The number one third would go here. <i>[first tick mark]</i>
41		RT1	Okay. Let's stop for a minute. How many of you agree that one third goes up there? How many of you would place one-third there where Alan is placing it?
42		RT5	Move to side, honey so we can see.
43		RT1	See what he did? He took the green rod and called that one and he took the three red rods and he marked off each spot at the end of the red rod he put a one third. Do you all see that? How many of you agree with that? He put the one third above?
44	6:44	RT5	Is it a third? Is it or isn't it?
45		Class	<i>[Many students in view raise their hands.]</i>
46		RT1	How many of you believe it's a third? How many of you believe it is something else?
47		Class	<i>[Few students in view raise their hands.]</i>
48		RT1	This is my next question; it's an important question. Alan is saying, and some of you are saying, that where I have that other little mark I can also put a third. I'm asking you then how where then would I mark two thirds? That's my question to you. Where would I put two thirds? I guess I

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			get a little confused when you tell me they are both one third. I'm kind of wondering what you are thinking.
49		Mark	[Walks up to OHP in front of the room.] Well, I would put it there [puts it over 2 nd tick mark]
50		RT1	Mark would put two thirds there. How many of you would put two thirds there also? [Off camera] You all would do that. Where would you put three thirds? Danielle, you want to come put three thirds somewhere?
51		Danielle	[Walks up to OHP in front of the room. OFF CRT2ERA. Places 3/3 above the third tick mark or 1]
52		RT1	Where would you put zero thirds? Andrew? Stay there Alan. I'm not finished. I still want you to talk about your stuff a little bit more.
53		Andrew	[Walks up to OHP in front of the room. OFF CRT2ERA. Places 0/3 above the first tick mark, or 0]
54		RT1	Okay. Zero third, one thirds, two thirds, three thirds, right? Or zero, one third, two thirds, one. Do you agree with that? Does that make sense? Is it okay to put one third where you have two thirds? If that is your number line and not rods anymore?
55	08:43	Alan	Well, basically, what you can do is this could be a third, and between there and here that could be a third.
56		RT1	Those distances are indeed one third. You proved it when you put the red rods. I believe that.
57		Alan	Basically, what comes to mind when you think of fractions you only think of the first one

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58		Alan	because you could put it here [<i>motions to first space</i>],
59		Alan	here [<i>motions to second space</i>]
60		Alan	or here [<i>motions to third space</i>]
61			and it would still be one third. But, you could put one third,
62			two thirds,
63			or three thirds.
64		Alan	You could put it in any one of those three places but you could still go one third [<i>motions to first place</i>],
65		Alan	That would be one third [<i>motions to 2nd place</i>]
66		Alan	or that would be one one third [<i>motions to third space</i>].
67		RT1	Does that really work? I'm curious? Andrew?
68		Andrew	I don't think it would work because if you just put red in the middle and call that one third, then if you put then on the left side of it three thirds then on the right side of it two thirds then you would be reading it two thirds, one third, three thirds. So, uhm, wherever you put it in that space, you always are going to have to start from zero because you cannot go from one down to zero because that is getting bigger. Because if you start it like that then you are just switching the zero and one.
69		Alan	Right. but you could put one third in anyone of these places but basically what comes to mind once you think of fractions is that you always think of the first one it could

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			go in anyone of these.
70		RT1	So you are saying the length of those rods happen to all be one third. Is that what you are telling me? The length of all of those rods are all one third and you are marking off the rods the lengths of one third, right?
71		Alan	Yeah
72		RT1	But, when you mark off the rods, to mark off where you place the numbers, is it okay then to make all those numbers equal to one third?
73		Alan	Yeah. You could put that there it would be equal to one third.
74		RT1	Yeah. That length is one third but when you place your numbers on the number line can you write them all as one third?
75		Alan	No. You can put that in the beginning on the number line; but, when you think of fractions you could put it in anyone of these places as long as like you are not basically trying to divide put another rod in there like this
76		Alan	then you would have to put something through there. But, you could put the third in any one of those but they are all the same length each so they still have the same fraction value of one third.
77		RT1	It is sort of like you are making a ruler. Andrew?
78		Andrew	Yeah, but you see, if you're doing that, you see, you put it in the middle, right, then the one on the left side of it is blank so what they would think it needs to be filled in so they would fill it in and it would be two thirds because

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			they mostly have spaces because you take zero to one hundred. You can't go one third would be next to one hundred it would have to put like, it would be three thirds next to one hundred because if you divide zero to one hundred into thirds you can't go from one third. And then, by the zero it would be three thirds.
79		RT1	Let me ask you a question. If I were making a ruler with whole numbers and I decided that I was going to mark off inches, right? Would it be okay on my ruler, once I decided an inch, you know what a unit of measure is an inch, like that would be one third? Is it okay to say when I make my marking, okay this is one and I mark another one and say this is one again and I mark my ruler again and say this is one and mark my ruler again and say this is one again. So it's true, they are all one inches in length aren't they, but would that be an okay way to make a ruler? Would that be helpful? Why not?
80		Sarah	It's not the way to put... A ruler has the different numbers that you count by so if you have all these 1s and you don't have the numbers that they belong to, then....
81		RT1	Well, Alan, would argue, I think, maybe not, that this is one and this is the same length one inch and this is the same length one inch, so why can't we mark these all one?
82		Alan	They are the same length, but you could take three more of these.
83		RT1	How do I mark my ruler? I'm making a ruler here for

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			fractions?
84	10:25	Alan	Right, but if you say you wanted to divide it. A ruler shows you how long something is like up here [<i>points to OHP</i>] say the red is one inch, one inch,
85		Alan	And if you add another one inch on there then that would be two inches
86		Alan	and you add another inch on there it would be three inches.
87		RT1	So what would I mark where the one inch ended. What number would I put here if I were making a number line or ruler?
88		Alan	You'd put one there [<i>put first red rod down</i>],
89		Alan	Two there [<i>puts second red rod down</i>]
90		Alan	and three there [<i>puts third red rod down</i>]
91		Alan	because that would be one inch and that would be two inches and that would be three inches.
92		RT1	And of course it agrees with what you said each of these are an inch in length. David you were going to say something?
93		David	Well, I was just going to say that uhm, they may be all the same thing but when you're measuring something then you know that if it is an inch you know how many instead of just counting all of them.
94	14:50	RT1	I know our time is up and this is a really good discussion. Alan, thank you, I may want you to talk about your other one a little bit more tomorrow. [<i>to class</i>] I'd like you to think about the little number line you made, the fraction

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			<p>number line between zero and one. And on our basis of our discussion, I want you to hand in the one you have, but I want you to make me another one, Okay? I'd like to see what you can do between zero and two for homework? See what fractions you know and what whole numbers you know between zero and two. Okay?</p>
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