Line	Time	Speaker	Transcript
1		T/R 1	suppose you had to manufacture these rods and make another color. Okay? Here we have a purple rod that's too small, right? To qualify to be a half. Do you agree the purple's too small? And here we have a yellow one, right? That's too big, right? To qualify, do you see that? If you were designing a new set of rods and you wanted to call the blue rod one, okay? Can you tell me what that new rod might look like so that you would be able to call it a half? [pause] Do you understand my question? We have rods here with ten, we have ten colors, don't we? You told me that yesterday.
2		Students	Yeah.
3		T/R 1	Right? And you all told me that if I wanted to call blue one in terms of the box you have, right? You can't find a rod that you could give a number name one half. Isn't that what you all told me? [mumbles of agreement] That's a problem. Because, um, there's another school that wants to have rods where they want to call blue one and have another rod that they can give a number name one half. Okay? Now can you tell me what the design of that rod might begin to look like? Why don't you talk to your neighbor and think about that problem? Do you understand my problem?
4		Students	Yeah.
5		T/R 1	We know it can't be purple and we know it can't be yellow. What do you think, David? You've convinced me that's there's nothing in between.
6			[T/R 1 and David confer at the OHP. Their conversation cannot be heard.]
7			[Erik and Alan as partners begin immediately:]
8		Erik	It can't be anything 'cause you can't divide nine equally. You see if this is
9		Alan	If you could

10		Erik	No you can't. This is ten.
11		Alan	If you could make a rod.
12		Erik	If this is ten [the orange rod], then this [the blue rod] is nine. It's impossible to divide this evenly.
13		Alan	Different rods. You might be able to, like if you divide a blue rod in half you could that that length and make a new color and that would equal up to halves. Which would mean it would be like [noise]
14		Erik	It's impossible. You can't divide it in half. You can't divide it in half, Alan.
15		Alan	Right, you could divide it in half if you had [inaudible] parts. You could divide it in half, but having equal parts, but you couldn't have equal numbers.
16		Erik	[inaudible]
17		Alan	If you cut this [the blue rod] down the middle, it would be four and a half, [inaudible] the same length.
18		Erik	Four and a half. You can't make a rod that's four and a half.
19		Alan	Um, hm. So you can't divide into anything.
20		Erik	Except thirds.
21		Alan	Except thirds. Or, or singles.
22		Erik	You can't divide it into halves. "Cause I put this up here and there are nine of these and one, two, three, four, five. One, two, three, four [pause] four, one two, there four five. One, two, three, four. One, two, three, four. One, two, three, four, five [He is counting the two groups of white rods next to the blue rod].
23		Alan	Over here you have thirds.
24		Erik	You can divide it into thirds, but you can't divide it into halves.
25		Alan	You can divide it into thirds. You can divide it into ninths.
26		Erik	But you can't divide it into halves.

27		Alan	You can't divide it into anything else but thirds and ninths.
28		Erik	Exactly, you're right.
29		Alan	Just thirds or ninths. That's all you can do. That's productive reasoning.
30		Erik	What?
31		Alan	Productive reasoning. So there can be only thirds and ninths. And the umm singular rods. And you can't divide it into halves.
32		Erik	Exactly. It's impossible to divide it in halves.
33		Alan	That can't be done.
34		Erik	It's impossible, Alan. You can't divide it into halves.
35		Alan	It's been proven.
36		Erik	Exactly. [noise]
37		Alan	Mind handing some over my way? All right um, what I'm going to do right now is make out of everything, I'm going to halve or third every color
38		Erik	You can't halve every color, you can third every color.
39		Alan	[singing] I can third every color. I can halve every color.
40		Erik	Except blue.
41		Alan	You can third.
42		Erik	You can third. You can third.
43		Alan	And ninth.
44		Erik	And ninth.
45		Alan	Now black.
46		T/R 1	Okay, I'd like us, if you don't mind, if we can stop for a minute and I'm going to ask Beth, Graham, and Jackie to come up and pose their solutions. I heard a few of your solutions. I know David has a solution I heard already, up front. I'd like to hear some other possible solutions. You can clear off there [the OHP] what you don't need.
47		T/R 2	What do you think, Sarah? [Sarah nods yes] I'm anxious I want to make sure you share that.

48		Meredith	You don't need the brown, all you need is
49		Beth	I got it, right here.
50		Jackie	[Places purple then white then purple rods in a line on OHP]. We thought that to make a new rod we would make, um, we would cut this white one in half and attach it
51		T/R 1	Could you speak nice and loud? Cause I'm a student back here and I can't hear you. Do you want to try and talk really loud?
52		Jackie	We thought of, to cut the white one in half and add it to one rod [purple] and then add it to the other rod [purple]. And we thought the color would be light pink.
53		Graham	[To Jackie] And the smallest one would be a half 'cause it was the white one.
54		Jackie	And the smallest one would be a half 'cause it was the white one.
55		T/R 1	Did you all hear what they said? No, they, Kimberly didn't hear you, dear.
56		Jackie	We thought to cut the white one
57		T/R 1	You can come in front and talk nice and loud, I know you can Graham.
58		Jackie	We could cut the white one in half and add it to the purple rod and add one one half to one purple rod and the other to the other one and we thought that we could call the color light pink.
59		T/R 1	And you said something else, what would your smallest rod be?
60		Jackie	Oh, yeah. Our smallest rod would be half of the white one.
61		T/R 1	What are you going to call that? [some giggling] You're the designers. What are you going, it's not going to be white, what do you think? You want to help them out? You could have other consultants to this design. Why don't you call on someone for help and consulting?
62		Graham	We cut the clear one [the OHP version of the

Description: Designing a New Rod Set	**Transcriber(s): Yankelewitz, Dina**
Parent Tape: What is one half?	**Verifier(s): Reid, Adrienne, Farhat,**
Date: 1993-09-21	**Marcelle**
Location: Colts Neck Elementary	**Date Transcribed: Spring 2009**
School	**Page: 5 of 7**
Researcher: Professor Carolyn Maher	

			white rod] in half to like make this. Then you'd, then you would have to cut like a reg- a regular one in half to be your smallest one
63		Meredith	[whispers to Sarah] They took my answer.
64		T/R 1	I see some hands up. Why don't you see if...?
65		Michael	If you're going to make a new rod, then you'd have to make a whole new set because there'd have to be a half of that rod, too.
66		T/R 1	What do you think, Graham? What do the rest of you think? Do you think there would have to be a whole new set? There are some other people who have opinions. Why don't you go, who's going to, why don't you take it, Jackie? You call on people, okay?
67		Jackie	Um, Brian.
68		Brian	No matter what, there'll always be something
69		T/R 1	Nice and loud, Brian, I can't hear you.
70		Brian	No matter what there'll always be something that won't be equal to something, like
71		T/R 1	Can you say a little more about that, Brian? Nice and loud.
72		Brian	If you cut these little ones in half, then there wouldn't be something for the little ones to make a half out of them.
73			[laughter]
74		T/R 1	Did you all hear what Brian said? That's, Brian, I, we didn't hear back here. Kimberly and I are trying hard. Can you turn around and say it nice and loud?
75		Brian	If you cut one of these in half then there wouldn't be a half of the litt, of the ones that you, of the halves of these.
76		T/R 1	What do you think about that? David, you had your hand up. Do you have a different point?
77		David	Well, before I told you. I thought that, uh, to cut it in half, too, but then I realized that, uh, that you would have to make a whole set.
78		T/R 1	Yeah.

79		David	And make a half for every one.
80		T/R 1	Okay, that's what we heard, um, Michael tell us. Meredith has something to say to the group.
81		Meredith	Well, you could just, if you do that then you'd have to cut the ones that are separate, the little blocks into halves, all of them, so then you could make it equal.
82		T/R 1	What do you think, Jacquelyn?
83		Jacquelyn	Um, it, I agree with Michael. 'Cause if you do that, um, it changes the whole pattern 'cause this has a set in pattern to it and the whole thing would change.
84		T/R 1	It's an interesting question, isn't it? It's an interesting question. So in other words, when you designed a solution, you're telling me, for the problem where you're making now a pink rod, is that what you're calling it?
85		Jackie	Yes.
86		T/R 1	You're creating a pink rod. And as I understand it, the pink rod is made up of purple and half a white. Is that what you said? Um. You solved the problem of having a rod that you can call one half when you call the blue rod one, right? But then, as some of you pointed out, then your smallest rod is then, with this new design, your smallest rod is then,
87		Meredith	Half
88		T/R 1	Half of the
89		Meredith	White
90		T/R 1	White rod, right? And what are you going to call that? Let's give that a name. Let's give that a name. Can you give that a name? It's not white any more. It's half of white. What color name shall we give it?
91		Jackie	Light blue.
92		T/R 1	Pardon? Light blue? Okay, so your smallest rod is going to be light blue. But I heard some other people say, like Brian in particular, and some others, Meredith, that, okay, you've solved that

			problem, but you could expect new problems. Yeah. That's interesting. Well, that's something to think about. You did a really nice job. Did anybody have another way to make the argument? James? [James goes to OHP]
93		F	[Sarah has a model of P-W-P built on her desk.]
94		James	Well, I thought that if you had a blue rod as one, you could take light green, imagine there are two others here. Then you could split the middle one in half and you could call that a light blue rod.
95		T/R 1	Is that okay? That's another way, huh? Does anybody have another way? ...Do you think there's still another way?
96		Meredith	Mmm hmm.
97		T/R 1	Do you think there are other ways than this? That's really good? Now, Mr. Purdy,