5.0.199   T/R 1:   I still want to go back to the problem Brian was helping them with the problem up there, I still wonder if we can solve this one because you started with this other one and you said that the orange and red [together] are one, right? Isn't that what you said?

5.0.200   Jessica: This is one whole, and then this is one third and this is one half. [pointing to the three different rod lengths]

5.0.201   T/R 1:   Right, and you said it's bigger by the red, right? And the question was, what number name do you give to the red? Now if you really understood what mistake you made here maybe you'll figure out what mistake you made up there.

[girls whisper to each other]

5.0.202   Jessica: Well, we and we, um, named, well, three reds equal up to um, one greens and then you put the purple next to it and you need one more red, you need a red to go next to the purple, so it would be one third.

5.0.203   T/R 1:   Well how can you build a model and say that one half is bigger than a third by a sixth and build another model that says one half is bigger than a third by a third? How is that possible? I am so confused. Brian, it's just his face tells me that he is so unhappy with that. Do you believe that Brian? They're still telling me that one half is bigger by—one half is bigger than one third by one third. Can anyone tell me what's going on here? I am so confused.

5.0.204   Brian: I don't- I still don't think so, well, because, well, well, see like I said before when you split the ahh, when you split the thirds in half and they make sixths, it's still like [He goes to the overhead.]

5.0.205   T/R 1:   So Brian is giving the red rod a different number name, he's not calling it a third he's calling it a sixth. They don't believe that though, they still want to call it a third. Someone has to-

5.0.206   Brian: See, well, because when you put it right there you see that, you see that there's one of these, if you put one of these on top of it you might see that, that it's that much that, that red, that red is that much bigger than one of the halves because one of these reds I'm calling is, is, is a sixth and anyway a half of one of these, a half of one of the thirds. But when you put it on top of one of the thirds it's that much bigger than one of the halves.

5.0.207   Jessica: Well, I think they might both be answers.

5.0.208   T/R 1:   You think it can be a third and a half? How many think they could be a third and a half? How many of you don't think it could be a third and a sixth? How many of you disagree?

5.0.209   Erik: I don't think you can have an answer of a third because if you have one half [he goes to the overhead] and if you take the one half which would be the dark green, you have the one half and then these [purple rods] are the thirds. How could one half be bigger than the

		thirds by one third? Because, and you have the half and the thirds together that the half is almost as big as two thirds, but yet the two thirds aren't exactly, are not exactly, the green, the dark green is not, the dark green is not exactly as big as two, two thirds but, two thirds, it's the, but it's far enough so that the two thirds are not bigger than it by one third.
5.0.210	Brian:	I kind of agree with Erik. I think now I disagree with them [referring to the girls].
5.0.211	Erik:	I don't really think that if you have this [a purple rod] that you could have one third bigger than it [Brian - yeah] because it's got to be one third and probably a third and a half.
5.0.212	Brian:	Yeah, he's right.
5.0.213	Erik:	It couldn't be, it couldn't be exactly a third.
5.0.214	Brian:	Cause one third bigger, this would be one third bigger like that to the end over there. That would actually be like this [showing with the dark green and purple pieces], this would really be one third bigger and there's still some left over and there's still about
5.0.215	Erik:	A half left over.
5.0.216	Brian:	Yeah, there's still, there's still one more, there's still one more piece left, like about a sixth left.
5.0.217	Erik:	Cause it's like if you have, if you have the like dark green and it doesn't exactly equal up to, it doesn't exactly equal up. It's less than two thirds but it's more than one third. It's just about one third and a half. So it couldn't be exactly a third bigger than it and it couldn't be exactly two thirds or it couldn't be exactly one third bigger. It had to be one third and a half.
5.0.218	T/R 1:	Michael wanted to say something for a long time and has been very patient.
5.0.219	Michael:	Umm, I think it should be called one sixth because [he goes to the overhead] because if you put six reds up to one orange [arranges six reds under the orange w/ red rod train] with a red then it would equal, there would be, there would be, it would be the same size just, so it would be called one sixth because reds like that.
5.0.220	Brian:	Yeah, I agree with Michael and Erik
5.0.221	T/R 1:	So, so Brian, Michael is offering another way of thinking about that red as being one sixth. You thought about the red as being one sixth to make a half of a third and Michael is saying that red is one sixth
5.0.222	Erik:	Yeah, Michael is right because it takes three sixths to equal one half, and if-
5.0.223	T/R 1:	I see Meredith is wanting to say something.
5.0.224	Meredith:	I agree with Erik, Michael and Brian because if you do call that a sixth, a sixth, and if you put the dark green and two thirds, you said

		it was, you said it was, um, they said that it's a third bigger, if you did a third bigger, this is called a third and then you put it there, you see negative, [Meredith placed a red rod next to the dark green rod]
5.0.225	T/R 1:	I'm sorry, Meredith, could you start again
5.0.226	Meredith:	You said it was one third bigger, that can't be true because one third bigger
5.0.227	Erik and Brian:	Yeah
5.0.228	Brian:	It's about one sixth less. So it can't be a third bigger.
5.0.229	Erik:	And also, like
5.0.230	Meredith:	So it's one sixth bigger
5.0.231	Erik:	And also yeah, and also, I think because if you have the light green, the light green, it's not bigger than, it's not bigger than the, it's not bigger than the umm third, it's not bigger than two thirds. It's bigger than one third, but it's not as big as two thirds so it's less than two thirds but more than one third. So it can't be a third bigger. And if you have that to make it two thirds large, there has to be a sixth.
5.0.232	T/R 1:	Well that is really something, uh I think --
5.0.233	Michael:	It's sort of like one sixth in both cases.
5.0.234	T/R 1:	Well you find that you are consistent, you do get one sixth when you use both models. I am really interested I, uh, hearing about what all of you are thinking about these arguments [To the children at the overhead] You can sit down now. Thank you very very much, that was very very helpful.