

DEBBIE BORDA: Antoinette do you mind if I ask you to talk about your reflections of the lesson first before we talk about what we noticed and what we would do next?

ANTOINETTE VILLARIN: Sure. O.K. So as a whole I was really happy with the strategies that I saw students come up with because it was strategies that we had anticipated. I was a bit thrown off with the time but that always happens with me. Explaining it took much longer than I had anticipated. So we did run off and the closure I wasn't too comfortable with. I'm glad that tomorrow there will be time for us to continue talking about that because I still don't think that students were very comfortable with the first strategy with Victor and Julia. I was interested in when we asked students to share the answers that we've got thirty-six and then no other answers after that. Because initially when I had walked around the room, I heard twenty-one point sixty come up a lot. And students were telling me they were finding forty percent of that fifty-four dollars. So it was interesting when I had chatted with you in the corner to see what we should do to address that, that students didn't forthcomingly (sic) say, "Oh, I got twenty-one sixty." So I'd love to talk about that.

DEBBIE BORDA: Can I ask you a question? I was wondering and I don't know this. When the right answer came up first -- the thirty-six, if the person who share that solution is actually someone in the class who's known as normally having the right answer, and I wonder if that made an impact on other people being willing to share that they had an answer that was different from that particular one?

ANTOINETTE VILLARIN: That's interesting.

DEBBIE BORDA: I don't know. It's something that I wonder because I don't even know who shared the thirty-six because I don't remember that at all.

ANTOINETTE VILLARIN: I don't know because I don't remember but there was just this hush. And I remember asking, "Are you guys sure there's no other answers?" So yeah, that was an interesting reflection. The other reflection was that I...we had two choices. I guess when we had planned it we had two choices of how we were going to close it. And one was "Which strategy made sense to you and why? Or look at the distracter questions or look at the distracter choices and pick how a student would have solved that?" At the last minute I think I chose the latter choice. And I don't know if that was good connection but I know we spoke a little briefly after. But I'm interested to hear what you think about that because I wasn't sure if that was the right one, if I should've waited for tomorrow.

DEBBIE BORDA: That's interesting. I don't know if there was a right answer. My initial reaction was "Wow it was a big jump from what we were just talking about." It didn't feel like it was seamless but in listening to the students right before they left, I almost felt like it really addressed that misconception before they left the classroom. So I'm glad you're coming back to it. I had a more positive feeling about it listening to the kids. Like Hoi Hue and Karl, they

immediately went through all three distracters in the very short time that we had and said, "This is this one, this is this one." And then Karl said, "I don't know where the hundred twenty-six came from." And Hoi Hue said, "That's the thirty-six dollar plus the ninety." So he got that immediately and then it was interesting because all four of them in this group had twenty-one sixty as their original answer. So I asked them, "Did they all look at one of the distracters and which one did they pick?" They said, "We all picked B." I asked them, "Why did you pick B?" and they said, "Because that's the answer we all got originally and now we can see why our answer was not the correct one." So the fact that...sorry something is going on next door. So I'm torn because I felt like it was not so continuous in switching to one of the understandings but yet it was really nice to know that was addressed before those students left the room and where it came from.

ANTOINETTE VILLARIN: Yeah. Because it wasn't addressed...I was hoping it would get addressed when we had listed it initially but it didn't. So maybe it was a good thing but I wonder what it would've been like for me.

DEBBIE BORDA: Yeah, so that's interesting too. Because we only had two strategies that got posted, not that there weren't more strategies in the classroom. Because we only had those two strategies, if we asked them what our original question was: Which one made most sense to you and why? I'm not sure the impact that would have had on them and their thinking. If they're still at that guess and check round maybe the thinking that Victor and Julia did with the intuitive bar model is still too far for them to say "I have any connection to that." Maybe it is still "The guess and check made more for sense to me because that's where I am." So I don't know how that's going to move them in any sort of direction to push them on their thinking.

ANTOINETTE VILLARIN: I guess there were advantages and disadvantages.

TEACHER: Students that I was over hearing that "They were disconnected from that." They were still in the problem and so maybe the kids who were ready to think about those answers got something out of that question. I'm not sure that any of the wrap up questions that you might have posed would have gotten everybody back together because a lot of the kids were still talking about or thinking about what they had seen. They were talking about "How did that made any sense to them at all?" And there was one group here still not convinced that twenty-one dollar and sixty cents is not the answer. So I think it's "What is your level of involvement in the strategies that produced an answer that make sense to you?" Because of the kids I overheard, not all of them were even ready to think about any kind of closure at all. They were still thinking about where they were in the problem. So I agree time was a factor here.

ANTOINETTE VILLARIN: A lot of the misunderstanding...because students did asked me when I walked around "Why does fifty-four dollars represent sixty percent? Why doesn't it represent forty percent?" was the question that I was getting. I think when Victor and Julia did that, they don't see it yet so maybe the next step would be to get them to see it.

DEBBIE BORDA: That's actually interesting because I don't know if this would've helped or not but one of the reasons I really wanted Victor and Julia to get theirs up there is when I asked them how they were thinking about the problem, they told me that they did a bar model. They described the bar model in their head that they were seeing, which is connected to their process. I mean it's just the visual that's in their process that they talked about. So I wanted them to go first because I assumed, which happens all the time to us, that they would describe what they had exactly described to me in the room that I'll have this visual to relate it to. And then other kids in the room could see that this is sixty percent and this is the forty percent but then when it came to actually sharing, they changed what they said. So that didn't give that visual support that may have helped some of those kids that are saying, "I don't know why it was sixty percent and why it's not forty percent."

ANTOINETTE VILLARIN: And it might have been the questions because I could kind of sense it in Victor's responses to me that it might have been the questions I was asking like, "Oh why are you getting that?" or "Where did you get that from?" I kind of can see it in his brain...his thought process in terms of how he was doing it but I was glad that he had shared it.

DEBBIE BORDA: I think so too. I think starting from the beginning of the lesson, I think it was valuable for them to take that time to make sense and talk about the problem before they started working on it. I think that helps with the language like we were talking about in making sense. I am still wondering what that does if you have a partner who's interpreting it the same way as you are and it's not an accurate interpretation. I don't have an answer for that. It's just something I'm wondering now after watching that happen. I value that but I'm wondering about that part of the issue that arises from it. But I think that was important for them to start to make sense of it and "What is being asked of you and what are the connections that you can make to the last problems?" And it was good to hear students say, "Last time we were finding the part and this time we're finding the whole." or the part that would take them to the whole, whichever way they interpreted that missing piece. So that was exciting, a little bit but there was the negative part, not the negative but it was the challenge too. What if they both have the same misconception?

TEACHER: When we go over that I thought it was a powerful entry into the problem. In listening to the kids retell what they think the problem is, so the question to me is "What do you do about those kids who still don't know what the story really is or what the question really is?" Two groups that I listened to were sure that it was finding forty percent of fifty-four. So the question is "How do you make that public?" Because probably if two groups thought that, there were probably others that thought that. That was really the question. And how do you make that public without shutting down thinking or putting people on the spot so they have to defend what they're not sure about? So that was the question I was left with about that.

DEBBIE BORDA: Well the other thing is that I struggle with that too because I agree. I'm always processing the advantages and disadvantages of doing this. If we were to take it to a public forum, like "What is this problem saying if number talks were essentially supposed to be mental math?" If we are taking it to that public forum and we discuss what we think the problem

means, then if we come to a common understanding as a class by lowering the cognitive demand of the test. So now we all know that we are looking for the same thing. So it's really not as vigorous of a problem to think about because now I can go back to a procedure that I know that might help me because I don't have to make sense of the math. I don't...so there's that part of it too. We've talked about that a little.

ANTOINETTE VILLARIN: When we were planning what type of problem we wanted, we had talked about that too. Should we have them think about how it's the same and how it's different and then have them share and should we have them share out loud? And that was a discussion that we had and I think it was an issue of "Let's see what they come up with." Maybe we can see the misconceptions come out if we go straight to solving it but I agree, you don't know when do you step in and when do you not.

DEBBIE BORDA: So then I wonder too. Do we want that? Do we want to dispel that misconception because then where's the discourse? So when we do come altogether and we all have the same answer and we all have pretty much the same strategy then what's the value on that? I don't know.

ANTOINETTE VILLARIN: Maybe the discussion tomorrow about "Where are you getting twenty-one sixty and why is thirty-six different?" That will come up...I hoping.

TEACHER: They knew what the problem was asking and I was expecting there to be more of "Oh I need to find forty percent of fifty-four dollars." And all three of them said, "Oh I need to find what the original is and then from there I can find what the discount of the percentage off is." And I said, "O.K. what strategy are you going to use?" And none of them had a strategy. So they all understood the problem but they didn't know how to get there. Eventually Christopher went to guess and check and he solved it with guess and check. But I was impressed and surprised that right away they knew what the problem was asking. I mean I had to interpret it myself.

ANTOINETTE VILLARIN: Yeah. The language in it. The forty percent off and...

TEACHER: And what the issue was then..if two people were talking to each other and both had the same misinterpretation or misunderstanding of the question then how can they support each other in finding the strategy that is actually going to move them forward? So that was why I don't know what the answer would be in that case. If there's one teacher walking around listening, your chance of hearing every one of those issues is pretty low. So I don't know what to do about that.

DEBBIE BORDA: That's where we were in a situation where we're lucky that there were multiple people listening because I had the same...the students that I listened to seemed to understand. Like Brian said, they were identifying the right part. I didn't have any of the students that I listened to identify fifty-four dollars as the whole, where as the kids that you

guys listened to all had that. And how do you make decisions based on what you here from the small number of students that you are listening to?

ANTOINETTE VILLARIN: I'm thinking that maybe even just a guiding question after. So maybe we share the problem out loud and then we ask them to think about "How it was the same and how it was different?" They think about it and share it with their partner. I'm wondering if we could've just asked them, not even ask them to respond but just the question to think about. Because that's what I started to do when I started hearing students say, "Oh you're getting forty percent of fifty-four, what percent does fifty-four dollars represent?" You'll have some kids say forty but that's kind of like...I just remembered that they would just look at me and say, "Oh, what percent does it represent?" I want them to get into that idea of that that represents a hundred percent minus the forty percent.

DEBBIE BORDA: Which is it? Is it the part or is it the whole?

ANTOINETTE VILLARIN: Yeah. I don't know if that's a question that necessarily has to get answered as a whole class. I don't know, there are so many ideas. We could've sent it there but I don't know if that would've sent them in that direction.

DEBBIE BORDA: I think it would be interesting to try a similar problem with that sort of prompting and see what happens.

ANTOINETTE VILLARIN: Yeah.

TEACHER: So just posing it as something to think about. Did you think about what's the whole? Did you think about what's the part?

ANTOINETTE VILLARIN: Yeah something like that.

TEACHER: I don't know if that's too late. I don't know. It's not leading them to a solution but at least...

ANTOINETTE VILLARIN: It's asking them to look at it. That's actually a good one instead of saying, "What percent does fifty-four dollars represent?"

DEBBIE BORDA: Right. Yeah. I'm wondering if you're saying fifty-four, if that is going to lead them to only focus on the sixty percent or is there other strategies to approach it. So that would keep it more open to a method that makes sense to them.

ANTOINETTE VILLARIN: Yeah. What does this part mean? What does that part mean? That'll be something good for tomorrow.

DEBBIE BORDA: Tomorrow. So the other strategies...I just kind of...I still like the problem. I think it was worded in a way that got to misconceptions and understandings. I don't know how

you guys felt about that but I think that it was an opportunity to either extend what they already understand or to challenge what they understand and bring up misconceptions that they need to address. So I feel pretty confident with the type of problems that we gave. Did you guys feel that way?

ANTOINETTE VILLARIN: It was a nice bridge too from what we were doing in the past when we were having different multiple steps. So it was nice that it's just one percent but that changed into "How much did she saved?"

DEBBIE BORDA: So can we talk about some other strategies? I know I saw a lot of guess and check. I did see kids try to guess and check and use a bar model. So they had the visual and they were trying the different numbers. And then I did see the bar model but those were the only ones I saw them do, the mental bar model.

ANTOINETTE VILLARIN: I heard guess and check. I had one student in the front we called on and said that they had solved it the same way. And a lot of kids, I'd say four pairs still grappling with "Why aren't we finding forty percent of fifty-four?" And they're still trying to make sense of that, so maybe time was an issue. Maybe if we had more time.

TEACHER: I didn't know how much experience I had with the bar model. So the group that I was working with, the only strategy that they had was the guess and check. So I wasn't sure whether or not I should've been but I asked them, "Have you guys worked with the bar model?" They agree that they had and I said, "Could you use that in some way to solve this problem?" And from there they're like, "Oh, so here is sixty percent and here's a hundred percent." And they were willing to take that lead but initially they didn't just go there.

TEACHER: I listened to Christian and Marvin. No, Christian and Marvin? Christian was...I'm only bringing this up because it's part of the dilemma that we've been talking about here. Christian so carefully described the bar model method. I could follow every sentence. I could draw or write down what he was saying. It was like a little mini number talk. It was perfect. He was not willing to share that. So it's too bad that he can't share in a larger forum of what was so articulate. But Marvin kept saying, "Yes I see that, yes I see that." It was quite obvious Marvin was seeing nothing. Seriously, I don't even want to know what was going on in his head because you could tell his eyes were just glazed. He could not follow at all. But the only response he could give was "Yes I can, yes I can. I can follow that. Yes I can see that that is." So I asked Christian to have Marvin talk to him about what each part was. So if Christian said, "I needed five boxes." I was hoping Marvin could say, "O.K. he needs five boxes. Where do five boxes come from?" They weren't resourceful enough to use each other as teachers. So what do you do for somebody like Marvin, who had a partner who could explain very clearly, well I thought very clearly, and two strategies on the board that I thought were clearly represented who still couldn't get anything out of the problem? So my question is what happens to the Marvins in here? Or Vinay and her partner who's only response was, "Well we thought it was twenty-one sixty but we know we did it wrong." So those would be my questions if I were the

teacher. My question to myself is "What about Marvin?" or somebody who stops and says, "We got it wrong?" I don't know an answer to that question.

DEBBIE BORDA: I think that's always a dilemma but I wonder in this particular case, having worked with these kids for the last couple of months now, that if they would of had more time. If any of that would have been resolved, I really felt like because we were pushing so much for time that there wasn't the time for "Now I know that I'm wrong but I don't have the time to figure it out." So was it the time or was it really shutting down? I don't know. I mean it's still an issue regardless but I wonder just with the particular kids in here. And Marvin, just from watching him recently, I think if he were to take out a piece of paper and pencil, he could figure it out. I think it was too much for him to hold in his head mentally because he usually is the one who shares his answer and getting them. So I'm wondering if it was also because he was sitting where he normally doesn't sit and the partner he hasn't been sitting with that that may have shut down some of the communication also. I don't know. And we purposely switched Vinay and Daniel today just to encourage that conversation because Daniel had been sitting next to Christopher for the longest time. And when they switched seats, he was still next to him. So whenever we did partner talk, he was still turning to Christopher. So there was never any interaction with Vinay.

ANTOINETTE VILLARIN: So we tried switching. We said "Why don't you two just switch seats?"

DEBRA BORDA: Yeah, so that may have had something to do with their...it's not a valid point because it definitely is something that arises regularly, but I wonder if those were any contributing factors. There were so many dynamics that were going on in the class.

TEACHER: The reason I brought it up is because here was somebody with a really clear articulation of various strategies. There was no question on my mind listening to him that he knew what those parts represented and why a bar model would work and how you could get him to share...

ANTOINETTE VILLARIN: With the rest of the class.

TEACHER: Well with anybody. I know he seems like he's painfully shy but he is so articulate. So it was really nice that someone was in here to hear that because I understand that he's always so quiet. So like I said it would be a question that I would ask myself. Not from the lesson but just what do you do with students who get it and can't share it or who don't get it?

ANTOINETTE VILLARIN: Or who is stuck.

TEACHER: Yes, exactly.

ANTOINETTE VILLARIN: A lot of them were adamant about twenty-one sixty and they couldn't get pass that. "It is twenty-one sixty and I did it this way." I mean they had a complete perfect explanation.

DEBBIE BORDA: And I think what's so interesting about the calculation that went into finding twenty-one sixty is that that is so hard compared to what the actual problem was. So they did so many maths in their head and they had to keep so many steps in their head and so much computation to get that forty percent of fifty-four, which was so much harder than just finding thirty-six dollars. That was interesting that they stuck with that.

ANTOINETTE VILLARIN: I started getting a bit nervous too because...I mean it was on a multiple choice but every group that I was talking to...I think it was only when I got to Malia and she said she guessed and checked. And her group were just looking at her but I think they were still convinced that it was twenty-one sixty. So listening to her guess and check...I mean if they just had more time.

DEBBIE BORDA: And I think that speaks to just the value of discourse and the class. If they had more time to come back altogether to talk about an idea like, let's say we talk about Victor's. We only had them talk a few minutes on the think per share but if they had more time to talk about that strategy and then come back together and then talk about the next strategy and come back together. I think just having that time to confront that misconception in repeated situations and start making sense of it, maybe.

TEACHER: So what about taking the pieces that you did in the end, the A, B, C, D? Because when you asked for incorrect answers or you asked for answers and some are going to be incorrect because there's only one correct answer. I mean if you have gotten all of those answers then have them talk in partners about how they came up with these answers. So if you did get one of those incorrect answers then you would think to yourself "Well wait a minute, my answer is there but is there another one?" So they're working all those solutions at that point.

DEBBIE BORDA: So then you bring up something that is interesting too. I think we actually never confirmed that it was thirty-six dollars.

ANTOINETTE VILLARIN: Yeah, we didn't.

DEBBIE BORDA: So we put up two thirty-six dollars, so that actually could be. We had two who said thirty-sixty but we had some people who said twenty-one sixty and some sort of...

ANTOINETTE VILLARIN: Maybe I can have someone share that tomorrow.

DEBBIE BORDA: Yeah. Debate on that.

ANTOINETTE VILLARIN: Because I think at the end when we put that up we said, "Pick one that you think is incorrect and think about where you may have gotten that." So somebody could've even picked thirty-six.



DEBBIE BORDA: Exactly, exactly.

TEACHER: If they haven't been so hesitant to share their incorrect answers then that discourse may have happened sooner and taken place before you even put up the A, B, C and D.

ANTOINETTE VILLARIN: I wish I remembered who brought up the thirty-six.

DEBBIE BORDA: I don't know if that's the case or not.

ANTOINETTE VILLARIN: No, it might be.

DEBBIE BORDA: It could have also been the camera. I don't know.

ANTOINETTE VILLARIN: Yeah. I mean normally they usually share. Sometimes we'll do things and there are seven different answers and everyone sharing their seven different answers.

DEBBIE BORDA: Well, there's the jewelry store. Remember that one day? Oh my gosh! We had twenty answers that they came up with.

ANTOINETTE VILLARIN: We had to go back to the math, so it was interesting to see thirty-six and then it was just hush.

DEBBIE BORDA: They were very quiet. They were very quiet on the think per share that first time too. That never happened. Under the strategy because we're talking about the guess and check and the making senses, so one of the misconception I saw happening but was interesting to watch and work through was Derrick and Malia. And they were trying to guess and check within the construct of a bar model. As he was talking to me about his strategy, he was applying his...he had reversed what we see happen in multiplication all the time. He had reversed the fifty-four to equal forty percent, which was what they were finding. They were finding the forty percent of fifty-four but when he was guessing and checking, if he didn't get fifty-four as the last two pieces in the model then he thought he was wrong. So when he tried a higher number, that forty percent went lower and that caused him to think "Oh, I need to now try a lower number because I need this to be fifty-four." So what he was attaching, the mixing up of the sixty percent of what is the whole and what the fifty-four dollars represent like what you were talking about. So he was kind of struggling through that. What's actually really nice later is after Victor and Julia shared and you said to talk with their partners. I asked him if he saw any similarities between the way Victor solved it and the way he was trying to solve it. And he said that he did so I asked him what the similarities were. He was able to identify that he did the bar model and he was doing the twenty percents. And I asked him "What was the difference in what you were thinking?" He said, "I was trying to find the wrong part." So even though he didn't have a visual of Victor's and that's only one example of the success in that situation, it was really interesting to watch him track through his thinking and to be able to make sense at the end after listening to someone else's process.

ANTOINETTE VILLARIN: That's interesting. That's going to be a good discussion about "Which parts are you finding and which part are you giving?"

DEBBIE BORDA: Yeah I think that that's good. Other observations or points of interest? Questions?

TEACHER: Question. Would it be useful to add a bar model as to somebody who actually visualized the bar model, not... What did you refer this to? This is the virtual? What did you call that one? Implied bar model? Something like that.

DEBBIE BORDA: It's obviously not an academic term.

TEACHER: It makes sense to me. I don't know whether it would be useful to get that actually written or not.

ANTOINETTE VILLARIN: Yeah, to get it written down as a strategy.

DEBBIE BORDA: So it would be interesting to ask Victor or anyone "Is there a visual model for each of the strategies?" I know Brian, you had an idea.

TEACHER: Yeah. Well the group I worked with, once I mentioned the bar model, they were able to talk about it. They broke it down into ten percents and after they were able to explain that to me I asked if they can relate the ten percent to Victor and Julia's way. So they said, "Well it's the same thing as we did but rather than finding ten percent, they found increments of twenty percent. So, whereas we found ten percent to be nine dollars, they found it to be eighteen." So they should be able to do it. Um, what was her name? Syani? Yeah, yeah and the girl was absent so I just sat on her seat. Basically took over with them. She was able to explain it. Then afterwards I had her explain Victor's from the beginning because the two boys were excluding her a little bit. And I said, "Include her, include her."

ANTOINETTE VILLARIN: Yeah because normally she has a partner to share.

TEACHER: But she was able to explain his completely. She explained what everything is and what everything meant. And then I asked her to relate it to the bar model that we had talked about in our group and she was able to make that connection as well.

DEBBIE BORDA: So that's why I wonder that instead of starting with the distracters tomorrow where they were at, is to actually get up another strategy. So maybe ask Syani to share hers and then ask if we can use...could we apply a similar bar model to Victor's so that it comes from the class, from them, to construct one that matches what Victor was thinking. And then come to some sort of agreement on "Do we agree this is thirty-six dollars or twenty-one dollars?" before talking about the distracters.

ANTOINETTE VILLARIN: Yeah I agree. I even want to make a poster where somebody's sharing how they got twenty-one sixty. Do you think that would be appropriate to do?

DEBBIE BORDA: I don't know.

ANTOINETTE VILLARIN: And put all those posters up or should we keep it as thirty-six?

DEBBIE BORDA: So to have that up there on someone's erroneous thinking?

ANTOINETTE VILLARIN: Oh yeah, I probably shouldn't put a name. I don't know.

DEBBIE BORDA: Well what if you didn't put anyone's name? Or if you just wrote this is how...you know how we have done in other times where I saw some people do it in their class? You just have it up there without any names attached and ask how it's similar or different from the other methods that we've seen.

TEACHER: Are you going to revisit the distracters at all?

ANTOINETTE VILLARIN: I want to, yeah. I want to.

TEACHER: Maybe then somebody...I mean you could in explaining the distracter, get up there of what people were thinking. How could somebody have thought...no not how could someone have thought because that would be saying...

DEBBIE BORDA: How could we come up with this?

TEACHER: Yeah.

ANTOINETTE VILLARIN: O.K. Rather than...

TEACHER: How could you have come up with it? How could somebody come up with twenty-one sixty? Or what might they be thinking? I really like the way they phrase that question: "What were the people thinking?" and "What was someone thinking to come up with that answer?" as opposed to "How did they get that answer?"

DEBBIE BORDA: I definitely would go back and try to get some more thinking on the correct answer.

ANTOINETTE VILLARIN: Use the visual.

DEBBIE BORDA: Yeah, use the visual.

ANTOINETTE VILLARIN: Would there be a visual with the guess and check? I mean finding forty percent of ninety?

DEBBIE BORDA: I don't know.

ANTOINETTE VILLARIN: I think the visual would be more helpful for that strategy because I think most students were comfortable with guessing and checking. If there was one that we really need to explain, it would be that strategy.

DEBBIE BORDA: Yeah, I know that Derrick and Malia were trying to use the bar model with the guess and checks but I don't know how that works with the numbers that Roger used and Austin. Which totally makes sense. I mean it's such a reasonable guess if you're going to guess. It's such a friendly number and percents were out of one hundred...you know it's such a reasonable place to start if you're going to start that way.

ANTOINETTE VILLARIN: Yeah because there's one group that I asked and they were working in a group of four and they got ninety on the first try. I asked, "How did you pick ninety?" and they said, "Oh we just knew that it had to be under a hundred" was what they said but I'm curious to see if they...

DEBBIE BORDA: Oh, that's good.

ANTOINETTE VILLARIN: Yeah. And it worked.

DEBBIE BORDA: Jackie and Michelle started with sixty-five dollars and then they went to eighty- dollars. But then instead of going up a little bit more, they weren't that far off. They were at forty-eight dollars so they only needed, you know the proportionality thing we hadn't really talked about. They only needed to get to fifty-four but they jumped all the way to a hundred twenty. I was like "Wow you guys!" I said, "Do you need to go up a little bit or do you need to go up a lot?" And they said, "We need to go up a lot." So I said, "O.K." And I don't know if they came to a conclusion after that because I went to the group behind them.

TEACHER: Something interesting happened in the very end when you asked them to pick a distracter and think about it. When the screen was down because the instructions were up, so Victor and, no sorry, Roger and Austin's poster was hidden. So the two girls who I was listening to chose ninety-two dollars and they were looking at Victor and Julia's poster and they couldn't find a ninety in it anywhere.

DEBBIE BORDA: Oh because it was the top one.

TEACHER: Yeah. No, no. In Austin and Roger's poster there's a ninety and there's a thirty-six and there was a fifty-four. There's no ninety in Victor and Julia's and that was the poster that those girls were looking for. So they got very confused about where would the ninety come from because they couldn't see it in the problem. So I noticed that was interesting. If the answer is there as a distracter, they should be able to see it somewhere and they couldn't see a ninety in Victor and Julia's work.

ANTOINETTE VILLARIN: Because in Victor and Julia's work you get the ninety by adding the fifty-four and thirty-six but you have to know how to do that. See maybe it is just the part-part. I mean maybe this class doesn't have enough experiences with knowing that when it is forty percent off you're paying the sixty percent off. And you're paying sixty percent and...you know. Maybe that's...yeah.

DEBBIE BORDA: That's interesting. So we've talked about the next steps with this particular problem but I'm even thinking of the next steps to develop that kind of thinking. I think if we stay with money, it's natural to do that because that's a context that they're familiar with and with the decimals involved. It's natural to connect those representations, fractions, decimals and percents and those kinds of calculations. I want to do other types of measurements, you know, like temperature. I can't think of anything but something that's not money that also can continue building that part-part whole idea with other contexts. Because we also haven't gone above a hundred percent. That's one other thing that we've talked about too is that they haven't had any experiences going above a hundred percent.

ANTOINETTE VILLARIN: Yeah. I've only given them a hundred and eight percent.

DEBBIE BORDA: Right. Well not like they have this mastered.

ANTOINETTE VILLARIN: I think they decided to go that way where we decided not to.

DEBBIE BORDA: I think it would be good to give them another context other than money but stick with measurement situations and really emphasize the part-part whole. That's what I'm thinking. I don't know. That's just a thought.

ANTOINETTE VILLARIN: Yeah, but I think maybe doing one more that goes with money where they have to find a hundred percent. Do you think maybe mastering that strategy first or it would be O.K. to...? Or not master but even understanding a strategy other than guess and check?

DEBBIE BORDA: Because that's what we had with the other problems. If we had them be a little bit more fluid before we changed it. And once it started to become a procedure then we changed some aspect of it so it was pushing them on their thinking a little bit more. That would make sense. Anything else?

TEACHER: Just as an outside observer, the first time I came in to observe the first one that you had done, now just their level of engagement is incredible. It was...you said, "Talk to your partner about it" and people turned and talked to their partners and had something to share. More or less as a person who isn't in here all the time to see all of those steps compared to the first time, they just felt comfortable with the process. That was something that they could really participate in with some sort of safety. It was very nice. Very nice.

DEBBIE BORDA: That's nice to hear.

TEACHER: Well because I didn't see all the intermediate struggles, not that there weren't any struggles today. I mean obviously Marvin wasn't participating but just the general tone of discourse was really remarkable.

DEBBIE BORDA: I think that the think per share thing is a really critical strategy. You know? I know it takes time but the whole developing of your ideas and the language simultaneously and kind of what you were talking about, Susanne, earlier. When you have the students who won't share publicly, there's at least that opportunity where they can share in a small group. They're at least being heard, they're being validated, being it right or wrong in their thinking, at least there's fifty percent of your class participating at one time. They're either speaking or listening and I think the more actively you're engaged and you're learning, the more you're willing to learn. Yeah, they have come a long way. I think it's really important...just instructionally to keep that strategy or to use it as much as possible and the think time.

TEACHER: Just that opportunity, both in the thinking and the peer sharing, just that opportunity to rehearse, if you're going to speak out I can rehearse it in my head or I can rehearse it to you. The more times I rehearse it, the more comfortable and articulate that a student can become. Just that opportunity is really...it was evident in the kinds of conversations that I was listening to that they were used to talking.

DEBBIE BORDA: Good job!

ANTOINETTE VILLARIN: They're a good group.