

MIA BULJAN: All right, so now you've had this very traditional decimal lesson. And, now you've come back to a number talk that is -- oh my gosh, this is so mean. Really? What were you thinking?

ERIKA ISOMURA: What? These were all easy up to here.

MIA BULJAN: Yeah. What?

ERIKA ISOMURA: Because I wanted to show that movement of the decimal point.

MIA BULJAN: Is this where Diego noticed it?

ERIKA ISOMURA: Uh-huh. [affirmative]

MIA BULJAN: Okay, so this is the one -- so by picking this sort of ridiculous number -- so you've moved away from single digits, essentially, with the zeroes. There was eight with zeroes and three with zeroes and one with zeroes, and now you've got 25 with zeroes and you were hoping that they would notice ...

ERIKA ISOMURA: That movement of the decimal point.

MIA BULJAN: And Diego, in fact, did.

ERIKA ISOMURA: Right. And he actually called out during this lesson, "Wait, that's the thing I was talking about on Friday."

MIA BULJAN: So he had discovered the pattern of this moving decimal point when you did the calculator activity where they were doing the mental calculations and then checking it on a calculator. So he actually discovered it then and -- is that what gave you the idea to do the number talk?

ERIKA ISOMURA: Yeah. We haven't addressed it as -- so we investigated a Federico and Rosa Linda idea. Their idea being, if you start with the smaller number divided by a bigger, you're always going to end up with a fraction or a decimal in the answer.

MIA BULJAN: Yeah. Yeah.

ERIKA ISOMURA: So, Diego's -- most of the class isn't quite ready for that yet, but I wanted to keep confirming with him from time to time that, yes, that has validity, we will be investigating it.

MIA BULJAN: Because the class is going to need that, and him -- his confidence in that idea is going to be crucial to moving their thinking.

ERIKA ISOMURA: Right. So, on the board we had done a little thing where he was talking about that movement. So that's the problem on the board.

MIA BULJAN: So, you're thinking at this point, like 90 percent of the class is like ...

ERIKA ISOMURA: Starting to get ready to talk about Diego's idea.

MIA BULJAN: On the edge of it.

ERIKA ISOMURA: I think on Monday we'll hit Diego's idea.

MIA BULJAN: Okay.

ERIKA ISOMURA: Yeah, so I just was curious. And he was all good with it.

MIA BULJAN: Did they do this?

ERIKA ISOMURA: Uh-huh. [affirmative]

MIA BULJAN: Oh, gosh. So now you're getting into even having to insert a zero placeholder here.

ERIKA ISOMURA: Right.

MIA BULJAN: And they had no problem with that?

ERIKA ISOMURA: No, they were fine with that. This was the only one in that they had some discussions because of this -- where the zero goes as a placeholder. So ...

MIA BULJAN: That's a real thing. That's a real thing. Okay. Wow. So now -- so let's talk a little bit about what you're going to do today because the kids will be back in a minute. You've done all these number talks. There's all these big ideas floating around. You have these sort of like anchoring activities all along. You're trying to connect the fractions to the decimals. You're trying to connect decimals to place value system. There's a lot happening. So now they've been doing this card sort. And the first thing you gave them was just a series of cards in decimal notation and asked them to just put them in order.

ERIKA ISOMURA: Order smallest to largest, glue them down when you feel confident.

MIA BULJAN: So there's a little controversy there. Some of the kids didn't want to glue because they were pretty sure they were getting it wrong and wanted the option to move it later?

ERIKA ISOMURA: Yes, and I told them that after we glue and after we discuss and after we get through the whole thing, you can go back and I'll give you a new set, if you *really* want to.

MIA BULJAN: I think that's so charming that they just assumed there's going to be wrongness.

ERIKA ISOMURA: Yeah.

MIA BULJAN: I just love that they are very comfortable with that. But anyways ...

ERIKA ISOMURA: So, that was on Wednesday, and at the end there was a conversation happening about "Can you prove that your order makes sense." And there was a lot of unsure how to prove it. So, Ruchita and Federico were working together as partners on this activity, and they had been talking to me about using common denominators.

MIA BULJAN: Okay.

ERIKA ISOMURA: So they said, “I know that I can rewrite my decimals as a fraction, so why not just do that and then find common denominators, and then use that to verify greater and smaller.”

MIA BULJAN: So writing this as $\frac{4}{10}$ and this as $\frac{41}{100}$ and then thinking of tenths as -- oh, they made them all into thousandths.

ERIKA ISOMURA: Yeah.

MIA BULJAN: Brilliant. You know what, it works.

ERIKA ISOMURA: Yeah, and they're still ...

MIA BULJAN: Oh my God, I'm so in love with that.

ERIKA ISOMURA: ... not quite positive that they want to go with the smallest.

MIA BULJAN: So as a teacher, as a teacher you're thinking, “Oh, this is awesome.” Did you think that they were going to turn them into both hundredths?

ERIKA ISOMURA: Yeah.

MIA BULJAN: And then they turn them into thousandths.

ERIKA ISOMURA: Yeah.

MIA BULJAN: Was there a moment -- did you have to think for a second, or did you just go with it?

ERIKA ISOMURA: No.

MIA BULJAN: There was no moment when you were like, “Really?”

ERIKA ISOMURA: I haven't emphasized the least common denominator. I've emphasized common denominators.

MIA BULJAN: Okay.

ERIKA ISOMURA: Because I think ...

MIA BULJAN: That's so funny.

ERIKA ISOMURA: ... at some point they are going to get tired of going with those giant numbers and having to do all that multiplying and they're going to -- and some of them do want to, and go, “Wait, there's smaller -- there's a smaller choice.”

MIA BULJAN: Right.

ERIKA ISOMURA: But until they want to, it doesn't hurt them to use a bigger denominator.

MIA BULJAN: It's just hilarious. Okay.

ERIKA ISOMURA: So that was -- everybody had to go back and double check and make sure that they were happy with their choices based on their common denominators.

MIA BULJAN: This sort of system of taking -- yeah.

ERIKA ISOMURA: Yes.

MIA BULJAN: Of when it gets tricky. So some of them were super obvious to them.

ERIKA ISOMURA: Yeah.

MIA BULJAN: And it was only when they got tricky.

ERIKA ISOMURA: Like $.2$ and $.25$ was a controversial pair.

MIA BULJAN: Does this have to do with -- is this a new number talk, or does this have to do with a ...

ERIKA ISOMURA: This was the number talk from yesterday.

MIA BULJAN: Okay. Can we hold on to this for a second, and can you show us a couple of the current posters before the kids come back -- what they're going working on.

ERIKA ISOMURA: Absolutely.

MIA BULJAN: Okay, so on the first day they did this white card, which was this -- tenths.

ERIKA ISOMURA: Right.

MIA BULJAN: And so ...

ERIKA ISOMURA: And this group was pretty much fine. And they found my trick.

MIA BULJAN: Oh, we loved this one. So we originally did not have this in the cards and then when we talked about it you said, "Well, wouldn't it be nice to have, like, $.3$ and $.30$, where they could -- do they recognize those as equivalent or not." I'm telling you all this.

ERIKA ISOMURA: Yeah.

MIA BULJAN: And this person did.

ERIKA ISOMURA: This group was fine. They found it.

MIA BULJAN: And then was it the next day you gave them a fraction set?

ERIKA ISOMURA: Yes, Thursday was the fraction set and they had to match it. There were a few missing and they had to write a fraction equivalent.

MIA BULJAN: Nice. Okay so, you had a couple of blanks, and they had to write what the fraction was.

ERIKA ISOMURA: Right.

MIA BULJAN: $25/10$. Who did that?

ERIKA ISOMURA: Dylan and Adam.

MIA BULJAN: All right. So, these kids are nailing it.

ERIKA ISOMURA: Actually, several kids did $25/10$. I thought they'd do $2\frac{1}{2}$ or $2\frac{5}{10}$ and they didn't. So, surprised. Yay. This group had a harder time with the decimals.

MIA BULJAN: They started out okay. Oh. Oh. Oh.

ERIKA ISOMURA: So, what I found out happened with this group was they were thinking the zero -- so, 0.0, 0.0.

MIA BULJAN: Got it.

ERIKA ISOMURA: 0.1, 2, 3, da, da, da, da. This has two parts so, this is the 30 and this is the 7. So, they were kind of doing little mini sets ...

MIA BULJAN: Got it.

ERIKA ISOMURA: ... when I talked to them. And then the sets with the whole numbers so ...

MIA BULJAN: They did not see the equivalence, and they're sort of not going across these different ...

ERIKA ISOMURA: And they're not really looking at them as a whole group. They're looking at them as these go together, those go together, those go together.

MIA BULJAN: So within this little rule that they made, this is how it would be ordered. And, within this rule, this is how it would be ordered.

ERIKA ISOMURA: Yeah.

MIA BULJAN: But not really thinking about the whole relationship across.

ERIKA ISOMURA: Mm-hmm. [affirmative]

MIA BULJAN: Okay.

ERIKA ISOMURA: And then, this group, I don't really know what this group is doing.

MIA BULJAN: I love this.

ERIKA ISOMURA: So this group ...

MIA BULJAN: This group is gluing things.

ERIKA ISOMURA: Yeah. So, they believe the .3 and the .30 but then ...

MIA BULJAN: They're hedging their bet here.

ERIKA ISOMURA: Right.

MIA BULJAN: Where is the equivalency. They're not sure.

ERIKA ISOMURA: And then they stuck the $\frac{8}{100}$ here. But I don't ...

MIA BULJAN: Are these even lined up with anything?

ERIKA ISOMURA: No.

MIA BULJAN: Are they just like -- are they just in order?

ERIKA ISOMURA: I think ...

MIA BULJAN: Are they just putting them in order and like not ...

ERIKA ISOMURA: I think they're just in order and I don't think they got the, you know, they're partnered. So, they're doing their own task.

MIA BULJAN: Nice. Nice.

ERIKA ISOMURA: And, it is what it is.

MIA BULJAN: There's just no way of knowing this. So, can you show us the two that they'll be working on today?

ERIKA ISOMURA: Yes.

MIA BULJAN: You're going to give them two new sets of cards. So this they should have known. Well, putting them in order I think is provoking, but the notation is very familiar for them.

ERIKA ISOMURA: Right. I was expecting the put in order to be a challenge, but I was hoping that they could match the fraction and decimal.

MIA BULJAN: Yeah, it seems like most of them did. Okay, so now we're going to be matching these to this sort of place value notation, really, where it's tenths and hundredths. A set of cards, it's two pages of cards that look like this.

ERIKA ISOMURA: Right, and then basically the number talks. Some of the work that we've done in various number talks.

MIA BULJAN: So some of the expressions that came up in the number talks. Trying to have them link those to basically what would be the value.

ERIKA ISOMURA: And not all. Some of them are very clearly partnered with number talks and others of them are from work we had done just in conversations, like random other things. And that one's -- there's a couple that are getting prepared for our decimal operations units.

MIA BULJAN: Nice. And you also have some blanks here. Do have some -- oh, I see them. There's blanks here. And so, when you set these -- when you made these, were you -- so you randomly took some out. Well, not randomly, but you took some out. Some don't have matches.

ERIKA ISOMURA: Right.

MIA BULJAN: And then are you forcing them to have to write any of these the way you do with matching?

ERIKA ISOMURA: I told them I do want them to.

MIA BULJAN: Okay, so, someone's going to have to write something.

ERIKA ISOMURA: Yeah.

MIA BULJAN: That will be super interesting.

ERIKA ISOMURA: Yeah.

MIA BULJAN: Awesome. Okay.