ERIKA ISOMURA: So you guys thought all of these were easy. Not a single one gave you a stumble.

STUDENT: I didn't.

ERIKA ISOMURA: Okay, so you had a couple that were a little bit tricky. And everybody else was like, boom, I could pound this out, no problem.

STUDENT: Mm-hm.

ERIKA ISOMURA: So I'm curious. If you have this in your head but that's what the calculator said, what made you think that that was an easy problem?

STUDENT: Oh, I didn't. I accidentally wrote it like that [inaudible].

ERIKA ISOMURA: Can you double-check that one for me?

STUDENT: Yeah.

ERIKA ISOMURA: Two-hundredths divided by a hundred. And that's...let's see. Zero wholes, that's a tenths, hundredths, thousandths, two ten-thousandths.

STUDENT: I forgot to put a zero.

ERIKA ISOMURA: Okay, that's fine but no, we don't change what our brain said. That is what your brain said and it's not bad to have something that disagrees. So what do you think happened that made your brain think it was two thousandths, but the calculator said it was two ten-thousandths?

STUDENT: I actually knew it was that, it's just that I forgot to put a zero because I was in a hurry.

ERIKA ISOMURA: So Jerry, the thing is whether you're in a hurry or not, this is what you wrote down. So where in the problem which...?

STUDENT: I think it is because I thought it would be [inaudible], I mean tenths, hundredths...

ERIKA ISOMURA: Ah, so where the decimal place was, you were thinking, "Here's my tenths, hundredths, thousandths, ten thousandths?"

STUDENT: Mm-hm.

ERIKA ISOMURA: Okay. So one thing that's helpful is to always remember that on this side, these are kind of whole things, and then we start counting from the decimal point if we're talking about decimals. So looks like you had the right idea, you just got a little bit confused about where that decimal point goes. So sometimes it's helpful to write your whole decimal and then start counting tenths, hundredths, thousandths, so that you kind of have that thing to help you identify what words to use as soon as you start counting across.

STUDENT: I thought of this one, like...I thought of it too fast, like, I wasn't paying attention to my decimal point, that's why I accidentally wrote the zero over here when I was trying to write it over here.

STUDENT: The [inaudible] divided by smaller.

ERIKA ISOMURA: This is divided by a smaller number? Four divided by ten?

STUDENT: Yeah. Four is smaller than ten.

ERIKA ISOMURA: So it's being divided by a smaller number or you're starting with a smaller number?

STUDENT: Starting with a smaller number.

ERIKA ISOMURA: Okay. Starting with smaller, starting with smaller. Nine is smaller than one-tenths?

STUDENT: No. But it's with the...a decimal.

ERIKA ISOMURA: Hm. Seven is smaller than one-tenth or one one-hundredths?

STUDENT: No but it's with the decimal.

ERIKA ISOMURA: Okay, so your idea that this method works with smaller divided by larger. True, true, true, true, true, not true. So, I wonder if this is something that we could prove mathematically, or this is some sort of weird coincidence because I just happen to pick strange numbers. What do you think?

STUDENT: I think it can be a math thing because if these are being divided by two whole numbers, two whole numbers and that with the two whole numbers, this number has to be divided by smaller, but then when it's with decimals, as long as there's a whole then it's going to be without a dot. And if...if it's a whole and you're dividing first with a dot then without the dot...wait. If you're dividing with a whole first, it's not going to have a dot. And if you're dividing with a decimal first then it's going to have a dot. And then you do the zero and then the times.

ERIKA ISOMURA: Okay, so if you're dividing a whole divided by a decimal, your “counting the zeroes and multiplying the non-zero numbers” works, just don't put in the decimal point. And then if you are dividing a decimal by a whole number, do your “multiply the counting numbers, count the zeroes, and put in that decimal in between the first zero and whatever comes after.”

STUDENT: Yeah. Didn't see that.

ERIKA ISOMURA: Can you do me a favor? That's okay, it was on purpose. Can you see if your method works for this problem?

STUDENT: This one?

ERIKA ISOMURA: Mm-hm.

STUDENT: That's it?

ERIKA ISOMURA: Just for now.

STUDENT: Okay.

ERIKA ISOMURA: So go ahead and do your method of your counting numbers, your zeroes, and wherever your decimal point goes, and then check on your calculator and see if that works.

So maybe the three of you should have one person in charge of pressing and everybody else monitoring. Are you all...is that person pressing the keys on the calculator the exact same way the rest of you are? Okay, so who's going to actually be the presser?

STUDENT: Yes.

ERIKA ISOMURA: Did it work?

STUDENT: Yeah.

ERIKA ISOMURA: Interesting! Now, can you see if it works here?

STUDENT: Okay.

ERIKA ISOMURA: Twenty-five divided by one-hundredths.

STUDENT: It's five hundred...two thousand five hundred. Divided by zero point zero one. Aww.

ERIKA ISOMURA: Okay, type that in again one more time. I think you hit a key wrong. Clear it out. Clear.

STUDENT: Twenty-five divided by...

ERIKA ISOMURA: Zero...

STUDENT: Zero...

ERIKA ISOMURA: Decimal.

STUDENT: Point zero one. Oh, I was right.

ERIKA ISOMURA: Hm, that's really intriguing. And one more. Let's see. You said this works. So those were whole numbers divided by decimals. Let's give you a decimal divided by whole a number and see if it works. So let's do twenty-five hundredths divided by ten.

STUDENT: Okay.

ERIKA ISOMURA: Does it still work?

STUDENT: Twenty-five divided by ten. Uh, twenty-five hundredths divided by ten. No.

ERIKA ISOMURA: No? What do you think? You're using your system, what would actually come out?

STUDENT: Um, there wouldn't be any zeroes...

ERIKA ISOMURA: Hold on. There's a twenty-five and a one, so you multiply that, right?

STUDENT: Yeah.

ERIKA ISOMURA: Write it down.

STUDENT: Twenty-five times one.

ERIKA ISOMURA: Okay, no no. Just in your head. So you said you were multiplying your counting numbers, but since we have twenty-five instead of counting number, let's try twenty-five times one. What is that in your head?

STUDENT: Twenty-five.

ERIKA ISOMURA: Okay, so write that down. Okay and where would the zero go from this idea?

STUDENT: Point zero. So twenty-five point zero.

ERIKA ISOMURA: Okay, so twenty-five point zero?

STUDENT: Yeah.

ERIKA ISOMURA: Okay, check it.

STUDENT: Point twenty-five divided by ten equals zero point zero twenty-five.

ERIKA ISOMURA: Hm. So we thought this was our idea but the actual was zero point zero two five. Okay, so we found a lot of cases where it does work and then we just found one that doesn't. But I think your method might have potential, so I think we should investigate because that was a whole lot of numbers where it did work. So there might be something there that we're just missing, kind of like Alex's thing where we're dividing fractions by whole numbers, and then we realize that whole number could be written as a fraction, and that solves some of our confusion. I'm wondering if there's something that we're not paying attention to here that might help us. So let's investigate that further when we meet again. Okay? Oh right, girls, did you hear Diego's idea? What did you think of it?

STUDENT: It was a really good idea.

ERIKA ISOMURA: You're like, there's some validity there.

STUDENT: Yeah.