00:00 So, what was the last question that we were looking at? Do we have that poster in front of us?

00:05 I liked that we got, you really pushed them to go outside what their favorite one was.

00:12 Like when I was observing, we'd done these really interesting strategies of making, you know, the time the same, making the number of beans the same,

00:25 And then when we got to this one, I was expecting them to do that. But almost every student seemed to go right for that unit rate.

00:34 Mm hmm.

00:35 Which is interesting, 'cause when we talked last time we didn't think students would go to that unit rate.

00:42 But then you asked that question, which was really nice, like, "Is there a simpler way?"

00:48 And so I went up to this one little boy, who was kind of like "I'm tired, my brain hurts!"

00:53 And I go, "Well, what could you change those to that would make it really easy to do?"

00:58 And I needed to look, and think about it a long time, you know, I would think like "30 seconds, easy to make them all the same"

01:08 "10 seconds," I had all different kinds of amounts of seconds. And he just goes, "Oh. Well. You could change them all to 5 seconds."

01:17 And I was pretty stunned with how quickly … he was at being able to do all that mental math. So that was another instance.

01:27 And it goes to—we had the thought that moving up, using the multiplicative idea of changing of rate, like 16/10 to "times 6," to get 60 seconds.

01:43 I thought that that was going to be the most natural way, and a lot of them did. One of the examples on the board was going to 5 seconds.

01:50 I thought that Emily had actually, she had done unit rate first. And I didn't ask her why. What I did ask her was, "Is there a simpler way somewhere on your paper?"

02:03 And she had pointed to all of them over 60 seconds. And in asking her why it was simpler, she said, "Well, I don't have to write anything down.

02:13 "I know that 15, 20 and 10 are all numbers that can go into 60, they're all factors of 60, so I can just multiply that number by the top number,

02:26 "The biggest number I have to multiply is 4, by 4, and so I can do that in my head."

02:31 So that was… but! That said, she still went for the unit rate first.

02:38 Yeah. But it was interesting, because when she was sharing that strategy with the class, or somebody was sharing that strategy,

02:44 You could hear everybody go, "Oh yeah! It's just like common denominators!" So it was great to hear them making those connections to other pieces of mathematics.

02:54 As they were thinking about it.

02:57 So, Becca, any other really big ideas from when you were looking at students? Because I know you took a lot of notes.

03:06 Well, I think one of the things, I started to think about some next steps. Sort of in "big picture" I just thought about

03:18 We're so in this that it's easy to forget where we're coming from, and what did our instruction in our classrooms look like last year?

03:24 What did they look like, what did these students in particular look like before we started doing all this work with them? Just realizing how far we've come.

03:35 And as we were… there was a moment in time at the board, as students were sharing out the idea of unit rate on one of the earlier questions,

03:47 And in our district and at Lipman, we've been working this year on connecting a t-chart with a graph, in terms of functions,

04:01 And "in and out rules," connecting these ideas in a situation. And I started to see the value, potentially, in bringing in a t-chart,

04:09 In particular for this idea of unit rate, to really help connect them. So I can see that as, as a next step for us as a staff to really look at.

04:22 How some of the things that we're already getting comfortable with, and getting our students comfortable with, can help them connect with this mathematics.

04:30 Much more tightly, and more…

04:31 Yeah.

04:32 I saw with the seventh graders that I teach in the lab class, they were working on a cheerios problem—different size boxes of cheerios, what's the best deal?

04:42 One of the young girls was able to figure out the unit rate, and in order to figure out how much a 640 oz. box of Cheerios would cost

04:56 Which is, THAT big.

04:58 She began a t-chart. She began, 1 oz. I know costs this much, 2 oz. costs this much, and I asked her, "Are you going to do a 640-line long t-chart?"

05:10 And she was willing to go ahead and do that, which I thought was interesting, so there was a nice connection there, but …

05:17 Yeah, so helping them to sort of see that idea of ratio, like I could multiply by 10, or I could multiply be 5, to build up would be an interesting connection.

05:27 An infinite number of..

05:28 Generalizations, so then the algebra piece, so we've got generalization of "Do I have to go one by one, or can I see the pattern and start to use multiplication?"

05:39 And then that one girl who made that generalization comparing those two strategies,

05:44 Yeah. What did she say? I had written one down. It was something like "If the seconds are greater…" no.

05:54 So…

05:55 You want fewer seconds, or you want more beans…

05:59 If you, but it has to do with the whole ratio. So that was a really nice piece. I think it's written down there.

06:07 Okay, so: in seconds per bean, we want less seconds. And then..

06:13 And then she'd said "beans per second, you want more beans."

06:16 Yeah.

06:18 And that was definitely the highest level of understanding… she, it didn't matter how the ratio was set up. She would be able to figure it out.

06:28 What constant you chose, she would know how to look at it. And I think, you know, a lot of the students,

06:35 What I saw is that they don't, they hadn't, they still don't really read what the rate is saying. And sit back and think, "Oh, 15 seconds. For 30 beans."

06:47 And really, well, what does that mean? You know? I mean, Omar in the back had said, "There's something having to do with half."

06:56 And he couldn't, you know, he SAW the half there, 15 over 30. And most of the other kids, because we gave it to them in the unit rate, saw it as a 2 to 1 ratio.

07:13 He saw the half, but couldn't get to what it meant.

07:17 Yeah. But I'm thinking that when we have students do the direct instruction, and pages of problems without any units on them,

07:28 They don't get to this same level of generalization that you were able to have your kids get to. So that was really interesting.