

STUDENT: Because if it's in the middle, the relatively middle, I can then go and put these in the middle, then put it in the middle.

MALLORY WILLIAMSON: So, what would we put in between one and one-and-a-half here?

STUDENT: I'd put two-eighths, because—because that—because the—I need to put—Oh, I need to put one-and-two-eighths, because one-and-one-eighth would go here, and three-and-one-eighth would go here. So, I'm doing this to give a relatively even spacing between them.

MALLORY WILLIAMSON: Spacing. And when you—One—One-and-one-half is half of two, so one-and-one-fourth is half of one-and-one-half. Okay. So, it is nicer to kind of divide these up in halves so that you do get a more accurate interval. Okay.

STUDENT: Okay.

MALLORY WILLIAMSON: So, what—What fraction would be equivalent to three-fourths?

STUDENT: Three-fourths would equal six-eighths.

MALLORY WILLIAMSON: How do you know that?

STUDENT: Because three times two is six and four times two is eight.

MALLORY WILLIAMSON: Okay, so we're looking at six-eighths. So, how many amounts of candy are on six-eighths?

STUDENT: Six-eighths. We have four-eighths, which means we have four—we have three-fourths.

MALLORY WILLIAMSON: Okay. So four-and-three-fourths. And what is question number one asking us to do?

STUDENT: How many—write a numeral equation and draw a picture/model to show how you could find the overall weight of the bag.

MALLORY WILLIAMSON: So, Grace, how did you figure out that we need to add those four sixes?

STUDENT: Because, um, and combine them into one large bag, so you could do three-fourths plus three-fourths, or you could do three-fourths times four.

MALLORY WILLIAMSON: So, why can we do both of those?

STUDENT: Because three-fourths times four is just, um, repeated addition.

MALLORY WILLIAMSON: Repeated addition. Okay. All right.

MALLORY WILLIAMSON: So, talk about, Grace, what you just shared with your group so that you guys can all be on the same page.

STUDENT: So, three-fourths times four, because there are four of the six-eighths, or you could do three-fourths times three-fourths—I mean, plus three-fourths, plus, and so on, until you get to four.

STUDENT: I think we should do the adding instead of multiplying. Because this is a multiple-step problem, so.

MALLORY WILLIAMSON: Sometimes we can just list the numbers we are using on our line plot, like your team talked about how they need to be in eighths, so it's easier to notice [inaudible]. So, finish up on that number line before you start answering those questions and when—Even if you're not done here, you're just going to use that one.

STUDENT: When you're done with that, make sure you put, like, these, so they don't, like, [inaudible].

MALLORY WILLIAMSON: Even if these other fractions that you [inaudible], how many two-eighths did you notice there are?

STUDENT: Yeah. Make sure that they, make sure that they make [inaudible], you know?

MALLORY WILLIAMSON: Two-eighths is equal to one-fourth, so how many one-fourth or two-eighths do you have?

STUDENT: One.

MALLORY WILLIAMSON: So, that's one. Two. Do you notice any other ones? And those are mixed numbers. So, because those are mixed numbers, those are going to be greater than one, on this side. But there's also one over here. So that's three altogether, so what can we mark on top of that to show that there's three one-fourths. Good. Okay. So, go to the next one. We've got three-fourths. So, find all your three-fourths and mark those.

STUDENT: Three-fourths.

STUDENT: I notice that we're only doing three-fourths. Wait. The three-fourths—That would be six-eighths. Six-eighths pounds, which we have four of those bags.

STUDENT: Would we have to times it?

STUDENT: We'd have to multiply it by four, seeing as there's four of those bags. So, we have to write like this. Six-eighth times—We'd do four. But because of how it is, it's four over one.

STUDENT: So, isn't it one-fourth.

STUDENT: No, it's six-eighths times four over one. So, we then do six times four equals twenty-four, and then there's eight below it, which that then equals, um, that then equals three pounds.

STUDENT: But we have to show why.

STUDENT: Yeah. We do.

STUDENT: So, I think a good model that could be shown is we do—

MALLORY WILLIAMSON: Talk to me about number one, because I notice that you guys have completed number one.

STUDENT: For number one, we did three-fourths times four. It equals twelve-eighths. Wait. Twelve-eighths. Oh, wait, no, twelve-fourths, which is equal to—is equal to three.

MALLORY WILLIAMSON: Okay, so you did three-fourths times four, and where do we get that four from?

STUDENT: We got the four from all four three-fourths, and so we times that, the three-fourths by four, because there's four of them.

MALLORY WILLIAMSON: Okay. So, and I also notice that you used repeated addition as well. So, can, um, one of you guys talk to me about how that addition is equivalent to multiplication? Why can we use both strategies?

STUDENT: Because—

MALLORY WILLIAMSON: Hold on. I'm going to let one of them explain.

STUDENT: If we do three-fourths, then we could just add three-fourths four times.

MALLORY WILLIAMSON: Okay, and how do I—How do I know that that's okay to do?

STUDENT: Um. Three-fourths times four is equal—

MALLORY WILLIAMSON: Three-fourths times four, you got what?

STUDENT: Twelve.

MALLORY WILLIAMSON: Twelve. Just twelve?

STUDENT: No, which equals three.

MALLORY WILLIAMSON: Okay, so I'm going to have a step back for a second. Can you guys draw me a model of what three-fourths plus three-fourths plus three-fourths plus three-fourths looks like? Like a picture or a model?

MALLORY WILLIAMSON: That's one three-fourths. Okay. What have you got? Joyce, you've got the same thing. That's very similar to what Christopher drew. So, Joyce, how many total shaded fourths do you have right now?

STUDENT: Um, three. Three shaded.

MALLORY WILLIAMSON: Three in this one. What about in this one?

STUDENT: Three.

MALLORY WILLIAMSON: So, what does that add up to be?

STUDENT: Three. No, twelve.

MALLORY WILLIAMSON: Twelve-fourths. And the reason being is because I notice that you see twelve over four is—How do we get twelve-fourths and three? Why are those equivalent?

STUDENT: Three times four.

MALLORY WILLIAMSON: So, three times four is twelve? Is there another way we can decide?

STUDENT: We could divide twelve by four.

MALLORY WILLIAMSON: Okay, and we could divide twelve by four to get three; a fraction is a form of division. Okay? So, when you're shading in these fourths, you get twelve-fourths, which does equal three, okay, and then when you multiply them, it is repeated addition. You have three-fourths listed four times. Okay? All right. Do you guys want to talk to me about how you're answering number two?

STUDENT: How I'm answering number two is that I'm adding these up, adding, like, on my line plot, on our line plot, have the three-and-one-eighth, so I'm adding those.

MALLORY WILLIAMSON: What does the question ask us to do for number two?

STUDENT: It asks us to—

STUDENT: Find all the bags of candy that weigh one pound into a single bag.

MALLORY WILLIAMSON: So, how on Earth, number line or line plot, are we able to see which one is greater than one pound?

STUDENT: We see that it's one pound and then we have them—We have to get the—We put the numbers down that are great—

MALLORY WILLIAMSON: Greater than one.

STUDENT: —up here in this area.

MALLORY WILLIAMSON: Okay, and what does it mean to combine them?

STUDENT: It means to combine them by adding them.

MALLORY WILLIAMSON: Adding them. Okay. Make sure you're listening to your teammates before you're the first one to talk, okay? They're wanting to share, but as soon as they hear you, they stop talking. Okay?

STUDENT: It would be three-and-three-eighths.

MALLORY WILLIAMSON: So, do you think you're going to get a large number? Or a pretty small one?

STUDENT: Large one.

MALLORY WILLIAMSON: How do you know it's going to be a larger value? Do you guys know how it's going to be a larger value?

STUDENT: Because it's one-and-one-eighths.

MALLORY WILLIAMSON: Tell me a little bit more.

STUDENT: Because there's—That's—There's going to be one, two, three, four, five, six, seven, about eight whole numbers.

MALLORY WILLIAMSON: About eight whole numbers. So, you are going to look for a number that's larger than normal. Okay. All right.

STUDENT: Next number is four-and-two-eighths.