MALLORY WILLIAMSON: The next step I'd like you to do is, I'm not necessarily going to reveal any information to you just yet, but I'd like you to now think about what would be a low estimate of how many sugar cubes would fit in this sugar cube container. What would be a high estimate on how many sugars could fit into this container? And then what would be a reasonable estimate, okay? So, on your handout you're going to see, right below the word estimate, there's a box where you can record and number for low estimate, a box where you can record a number for high estimate, and then you can place your estimate on the number line according to where you think it's going to go between the two, okay? All right, so go ahead and have that discussion with your group, and I'm interested to see what you guys come up with.

STUDENT: 25 is—25 cubes. Have you seen 25 sugar cubes?

STUDENT: But think of the width. They could probably pack like 10 of them, boom boom, that's already 20.

STUDENT: I was thinking of 100 for that.

STUDENT: 100?

STUDENT: 100 is definitely higher than my estimate. All right, let's go with 20 then. Maybe a reasonable one would be about 50?

STUDENT: Yeah, around 50 would be. So, about, like—

STUDENT: Right here.

STUDENT: 50 is closer to 20 than 100. Wait, yeah. 30 and then—so this should be a little bit more, like, over here. Instead of, like, right in the center it should be like a little bit over here like this.

MALLORY WILLIAMSON: ...looking at this image to reason through that.

STUDENT: Like, I, I'll pick us 50 for here.

MALLORY WILLIAMSON: So, 20 is a low, so you're saying if you double that, it's going to be a high estimate.

STUDENT: I would say fif—500 is more.

STUDENT: I feel like—I feel like there's gonna be like [inaudible].

MALLORY WILLIAMSON: Well, looking at that image, how tall do you think that box is going to fit with sugar cubes?

STUDENT: Well, compared to—If you look at the sugar cubes they're pretty tiny against the box so—

MALLORY WILLIAMSON: Right, so how many do you think—If we were to stack them up, how tall do you think that would be?

STUDENT: 453.

MALLORY WILLIAMSON: You think it would be 453 tall?

STUDENT: Yeah, because one thing [inaudible 00:02:23].

MALLORY WILLIAMSON: I think 453 stacked up is going to be a lot larger than the size of that box.

STUDENT: Yeah, but once you—Wait.

MALLORY WILLIAMSON: How many cubes would we have?

STUDENT: Like 200 and—

STUDENT: No, half is like, like—

MALLORY WILLIAMSON: 'Cause, Angel, look at the cube. [inaudible 00:02:39] here.

STUDENT: That's not gonna fit—

MALLORY WILLIAMSON: So how much would be about half?

STUDENT: 30.

STUDENT: 60 or 76.

STUDENT: 35.

MALLORY WILLIAMSON: For half?

STUDENT: Like 35?

STUDENT: No, 30—30, 35 would be like, less than a quarter.

MALLORY WILLIAMSON: I think you guys are not reasoning through what you see, 'cause if you notice one cube goes about here, so much would be about half?

STUDENT: Five cubes.

MALLORY WILLIAMSON: Okay, that's a better estimate than 30. So, if you were to then double it --

STUDENT: That would be 15?

MALLORY WILLIAMSON: That would be about...

STUDENT: Ten.

MALLORY WILLIAMSON: Ten, 'cause five times two is ten, as far as the height goes. So, reasoning through your different measurements, you can kinda get something that's high. Now, I agree, 500 would be a high estimate.

STUDENT: That's too high.

MALLORY WILLIAMSON: Right, it would be okay 'cause it's an extreme estimate. So, now what do you think would be a reasonable number?

STUDENT: 50.

MALLORY WILLIAMSON: Okay.

STUDENT: I think 50.

MALLORY WILLIAMSON: 50? Okay, if we're all—

STUDENT: Because, um, that's probably gonna be the lowest.

MALLORY WILLIAMSON: Why?

STUDENT: 'Cause the cubes are small and they could, like, fit in them.

MALLORY WILLIAMSON: Okay, so you think that you can fit more cubes than 10?

STUDENT: I was thinking, like, there's four going this way for how—

MALLORY WILLIAMSON: The width, is that what you're describing? Like going back?

STUDENT: Yeah.

MALLORY WILLIAMSON: Okay, so there's at least four of the width.

STUDENT: And then going up is at least 8 or 10.

MALLORY WILLIAMSON: 8 or 10? So, if your height is at least 8 or 10, you know that's a pretty low estimate, okay? And you guys have 90 as your high estimate, so wh—how many cubes do you think are actually in the box?

STUDENT: 30.

MALLORY WILLIAMSON: 30?

STUDENT: Around, around 30.

STUDENT: About 32, yeah.

MALLORY WILLIAMSON: Around 30, okay. So, 30's half of 60, so I like that you put yours in between on that number line accurately.

MALLORY WILLIAMSON: So where do you think 30 would go on this number line, since you used 90 as your high?

STUDENT: About like, right here?

MALLORY WILLIAMSON: Right, 'cause 30 is a third of 90, so I agree with you on that.

MALLORY WILLIAMSON: You have 60? 30 is half of 60.

MALLORY WILLIAMSON: Group 5, can you guys give me the estimate that you decided to go with on how many cubes would go into the box?

STUDENT: The reasonable one, low, or high?

MALLORY WILLIAMSON: The reasonable one.

STUDENT: Oh, 60.

MALLORY WILLIAMSON: 60? Okay. Is there a reason, like a strategy you guys used for why you decided 60? 'Cause I know we can say, "Oh I eyeballed it." Well, what on there kind of helped you decide that 60 would be kind of reasonable.

STUDENT: How small the cube is.

MALLORY WILLIAMSON: Okay, so maybe how small the cube is?

STUDENT: And we don't know how wide it is.

MALLORY WILLIAMSON: Okay. So, we're—How many cubes do you think creates the width? Just based on the short snippet I showed you?

STUDENT: About two, three.

MALLORY WILLIAMSON: Two or three, okay. So, taking two or three and starting from there, with your height or your width, okay. All right, group 4, what was your reasonable estimate?

STUDENT: 65—

MALLORY WILLIAMSON: 65?

STUDENT: ...for me and, and then he had 50, right?

STUDENT: Yeah.

MALLORY WILLIAMSON: So, 50 to 65?

STUDENT: Yeah.

MALLORY WILLIAMSON: Okay, group 3?

STUDENT: Um...

MALLORY WILLIAMSON: What would your reasonable estimate be?

STUDENT: Well, first we said 60 but now we put 100.

MALLORY WILLIAMSON: Okay, so maybe between 60 to 100? All right, group 2?

STUDENT: Um, 20s to 90s.

MALLORY WILLIAMSON: What was your middle estimate, your reasonable estimate?

STUDENT: 55.

MALLORY WILLIAMSON: 55 or 50. And group 1?

STUDENT: 30.

MALLORY WILLIAMSON: 30?