

MALLORY WILLIAMSON: So, we have some good starter questions just to kind of get us rolling on maybe what this task is going to be all about, or maybe what kind of a problem we're going to be solving. So, a lot of you, right on the dot, have got the main question, okay? So, I'm going to reveal to you guys the main question. And what I want you to do is I want you from there, estimate what that is. Okay? So, the main question is actually the first question that was asked. And that was how many sugar cubes are in the box? So, if you would go ahead and write down and record that main focus question. How many sugar cubes are in that box?

MALLORY WILLIAMSON: Okay, to help us kind of then start thinking about how to answer this focus question, what I'd like you to do is we're going to go to the next section which is a part of act two. And I'd like you to brainstorm with your group. Okay, if we're trying to figure out how many sugar cubes are in this box, what is some information we need to know? So, I'd like you to record everything you can think of, whether it be a question, a concept, an idea and write it down. What are all of the pieces of information you're going need to know in order to find out how many sugar cubes are in that box, okay? All right, you can begin.

STUDENT: Multiply and we can find how much it is.

STUDENT: Well, let me add on to a bit of that. How... 'Cause we're not do... 'Cause a sugar cube as you can see is 3D, so we want the length, the width, and the height. So, it should not just flat on here, and then we can't go up.

STUDENT: Mm (affirmative).

STUDENT: So, I think I'd like to know the length, the width, and the height of the sugar cubes in the box so like, if it's an inch tall, an inch wide—

STUDENT: Then we can multiply to find how much cubes are in the thing.

STUDENT: Exactly, so, if we... We could then add it up until it fills the box. So, I would...

MALLORY WILLIAMSON: ...grams, it might give you an estimate on when you're dividing the total amount of grams per gram, but that's going to necessarily... That doesn't know if it's like, loose sugar or if it's the packed-in sugar in the cube. That's not going to give us necessarily an accurate measurement on the length of something or the width of something.

STUDENT: I would like to know the length, the width, and the height...

MALLORY WILLIAMSON: What might we need to know in order to find out how many cubes are in the box?

STUDENT: Are the sizes of the sugar cubes can... the same and do the sugar fill—cubes fill the height and the length...or the width?

MALLORY WILLIAMSON: So, we can write down...And I know Elizabeth did that as well. We can write down we're going to need to find out the size of the sugar cube. And what's the second thing you're going to write down, Elizabeth?

STUDENT: The size of the box.

MALLORY WILLIAMSON: The size of the box? Okay.

STUDENT: That would make sense.

STUDENT: Yeah.

STUDENT: I think you should go with that.

STUDENT: So, we're gonna have to estimate the measurements.

STUDENT: Yeah, it also depends on... because not every time, it's not always gonna be filled to the top. Sometimes it'd only be halfway.

STUDENT: Yeah.

STUDENT: So, it also depends on if it's gonna be filled halfway, a quarter, three quarters...

STUDENT: Yeah, how like, how.

STUDENT: How full is it gonna be? The capacity.

STUDENT: I get that. So, uh, any other things that you guys are thinking of maybe? 'Cause I have (laughs)...

STUDENT: Well, it also depends on like... 'Cause you can also break down the cubes, and you could also put it in there. And can't you just measur—measure that by, like, grams?

STUDENT: 'Cause some of them could have broken while they were in the box, you know?

STUDENT: Yeah, some of them could have broken.

STUDENT: So...

STUDENT: So, we could also see if we can try to do that and see if it... All the sugar that's like leftover could equal into, like, one sugar cube.

STUDENT: Yeah, cause I... Yeah, that's what I was thinking in my head. Like the sugar cu... I'm, I feel like sugar would be like falling off already.

STUDENT: Yeah, 'cause it can trip off.

STUDENT: Yeah.

STUDENT: Okay, so we can put that down.

MALLORY WILLIAMSON: So, both of you have the same concept. Both of them related together. Okay? Is there anything else we might need to know?

STUDENT: Um...

MALLORY WILLIAMSON: 'Cause you said something really important that once you find these two, what's maybe a direction or strategy we can use?

STUDENT: Multiply...

STUDENT: Multiply and dividing.

MALLORY WILLIAMSON: We can use multiplication, or I know that your strategy was taking and dividing the measurements.

STUDENT: The box by...

STUDENT: One cubed.

MALLORY WILLIAMSON: Okay? So, there could be multiple ways of finding that. We just don't know yet. Okay?

STUDENT: Okay.

MALLORY WILLIAMSON: All right, what do you guys have? I would like to know the length, width, and height cause you need to know the height of the cube to figure out how tall it is. What do you mean by, "it is?" The box?

STUDENT: No.

MALLORY WILLIAMSON: How tall the...

STUDENT: Cube is.

MALLORY WILLIAMSON: Cube is? Okay. To figure... To use in order to find the length, width, and height of what? So, how can we use the length of the cube...

STUDENT: To find how much cubes you have, like, within—

MALLORY WILLIAMSON: To find the length of the box. How many cubes would equal that length of the box? So, I would add on the height of the cube in order to figure out how tall, or how wide, or how long that box is, okay?

STUDENT: So...

MALLORY WILLIAMSON: So, you are going to need to know the length, width, and height of that cube in order to help you figure out...

STUDENT: What about also the box?

MALLORY WILLIAMSON: Mm-hmm (affirmative).

STUDENT: So, we know how many sugar cubes can fit in that area. So, like, say the sugar cube is in an inch on all sides. I don't think it really is...

MALLORY WILLIAMSON: Okay.

STUDENT: And then the sugar cube... Um, then the box on the sides is three inches. So, then we know, oh, these sugar cubes can fit three on this side. And it's six inches this way. Oh, it can fit six on this side.

MALLORY WILLIAMSON: Right, because the cube, if the dimension is one inch by one inch by one inch... That can help us find the height, or length, or width of a box. So, both of you have the same concept.

STUDENT: And then, like, if it is, like, a foot tall... So then, 3 times 6 is 18. You would just need to multiply that by 12.

MALLORY WILLIAMSON: If you're converting from feet to inches, yup. So, I like where you're going. We're going to see if your strategy works.

STUDENT: I found one.

STUDENT: Wait, we found another one.

MALLORY WILLIAMSON: You have a good one?

STUDENT: How did they put the sugar cubes in the box?

STUDENT: Did they stack them or did they just...

MALLORY WILLIAMSON: Oh, hm. That's a good idea. If you just throw all the sugar cubes in—

STUDENT: Then, you can fit more if you stack them.

MALLORY WILLIAMSON: Yeah, compared to if you were going to compact them or stack them together.

MALLORY WILLIAMSON: So, how do you think they would stack them?

STUDENT: They would in rows.

MALLORY WILLIAMSON: Rows?

STUDENT: Yeah, like five...

MALLORY WILLIAMSON: Like, columns?

STUDENT: Yeah.

MALLORY WILLIAMSON: Okay, so it's a good point. If I just throw all the cubes in, I may not have as many as if I were actually organizing them into rows or columns.

STUDENT: Yeah.

MALLORY WILLIAMSON: That's a great idea. Great concept.

STUDENT: Don't they [inaudible].

MALLORY WILLIAMSON: Huh?

STUDENT: What are those for?

MALLORY WILLIAMSON: For, like, coffee. You can drop a sugar cube in. It dissolves.

STUDENT: Oh. Are they like marshmallows?

MALLORY WILLIAMSON: No. (laughs) They're sugar packed into a cube. So, if you put it in your tea, or if you put it in your drink it dissolves and that adds sugar to it.