

STRATEGIC TOOL USE: WINDOWS, DINOS, AND ANTS

The Standard for Mathematical Practice "Using Appropriate Tools Strategically" is all about making choices. Oftentimes those choices are around conceptual tools, like a graph or two-way tables. In some cases, they're very concrete, such as which measuring device to use. In this lesson, we see that students have a practical choice to make, but the key move that the teacher makes to allow students to engage in the practice is that he gives them a choice of which tools to use to solve the problem.

JOE REILLY: Your problem is to figure out a way to measure the distance from our window all the way down to the playground.

(students exclaiming)

And then be able to measure it with a ruler and tell us how far it is. When we throw the things out of our window, do we have to measure it while it's on the side of the building?

STUDENT: No.

REILLY: Why not?

Because it would be, like, too hard.

REILLY: So how can we measure it?

STUDENT: Bring it back up and then somewhere lay it down and with a ruler or something...

REILLY: I like it, I like it. Do you guys like that plan?

STUDENT: Yeah.

REILLY: Okay, you're going to be at that window... Are you ready?

STUDENTS: Yes.

REILLY: Okay, we're going to drop the whole ball of twine.

WOMAN: Okay.

REILLY: So don't let it bop on your heads, okay?

(laughs)

STUDENT: What happened?

REILLY: Okay, do you have...?

STUDENT: Yes, I'm holding on to this.

WOMAN: Okay, good.

REILLY: Okay, Joe, that's yours.

WOMAN: All right, Joe, what are you going to do with this now?

REILLY: Okay, now, get it right to the end. But don't let it go, because that's what we're going to measure, all the way to the end. Perfect. Start letting them down. Now, Theresa, you just tell us when we're at the bottom, okay?

WOMAN: Okay, we're at the bottom. We're going to cut. Okay, that's it. They're going to pull it back up now. Okay, Theresa, you need to catch those links.

STUDENT: I'm almost done with the reds.

REILLY: Okay.

STUDENT: Keep going!

REILLY: Keep going, we're trying.

WOMAN: Okay, Theresa.

STUDENT: Stop!

REILLY: What?

STUDENTS: Stop!

REILLY: Okay, this is your measure. Now, don't add these into the other ones. Carefully bring them up. I'm going to get Carly to do hers again.

STUDENT: Pull it up again!

Yes!

REILLY: Come on over here. Let's talk about how we're going to measure. I'm going to go out in the hallway and check on the people who are doing the dinosaur measuring, and your job is to measure the strings or the links or the yarn that you brought up, but I'm going to give each group only one of these. So is there somebody that can show us how to use one of these

for measuring the whole business, so I know you know what you're doing? Chris, you want to show us? How are you going to do that?

LeGEROS: Ideally, for students to get a chance to engage in this math practice standard, Using Appropriate Tools Strategically, each student would have the chance to think strategically about which tool to use to solve the problem. Here we saw a couple of different tools being selected, both the measurement device in terms of a ruler and the object that's being dropped to the ground, like the string or the linked chain.

STUDENT: Um, used the ruler and we used these, like, links down and...

LeGEROS: Note that to actually be strategic, students have to have facility with the tools and understand their purpose. And so, built into this lesson, students are actually practicing how to measure using a ruler – a very important procedural skill. In the Common Core Math Standards, students reach proficiency through three different types of learning. There's applications, which we see here as students are solving an applied problem. There's fluency, which we see here as students are actually measuring with a ruler. And conceptual understanding, which we see here as students explore ideas of iteration of unit lengths and indirect measurement.