[MUSIC PLAYING]

SPEAKER 1: Science Theater is a powerful tool to help students understand complex unobservable objects and processes either at the micro or the macro scale. This is also a really great example because it helps students understand that scientists use multiple forms of representation to be able to understand concepts.

In terms of equity, engaging students in kinesthetic learning helps provide more access point for a wider variety of learners, and supports students creativity in expressing their ideas disrupting the idea that learning has to look a particular way.

The video you're about to see is a team of fifth grade teachers who were using Science Theater to help their students understand how molecules moved across chromatography paper. As you're listening to the teachers explain why they did this, notice how they used relevant metaphors to help students understand the complex ideas, and how because their science theater included many people, they would be able to include broad student participation.

One thing to note about the video is that the video is in black and white, so take a look at this picture so you can get an idea of the colors that were used during the actual lesson.

SPEAKER 2: So really we're just going through-- most of this is what you all did also, which was just different models of chromatography. But one thing that we were talking about as we were going through this, just in teacher talk at lunch and whatnot, is that we think that, we love the high level thinking that students were doing.

And that it did feel like it was scaffolded along the way, but we also felt like there was a lot of just listening, either listening to other partner talk, or listening to a teacher talk, or just a lot of listening skills needed. And so we also wanted to add in, way earlier, models that included active movement.

And so Nicole had this great idea where she was doing the model of-- it's chromatography. And then we just were adding into it. And so we got this idea for those many of us in this room that did physics classes together, and we did physics theater. And so we were taking that idea of modeling a whole class model of the chromatography with students. [INAUDIBLE]

NICOLE: OK, so we're just going to need a few volunteers. If you could come up, [INAUDIBLE].

SPEAKER 4: So we just put on the slides of the progression of the different models that we all did. So [INAUDIBLE] started with the chromatography, and we did the fan model. We did our-- here are some examples of the nanovision model. And then after this we still thought it would be helpful for them to get a better understanding of the different properties that were in play. So this is what we're going to do.

NICOLE: So we're just going to have you stand here. This is my whole class. And we found it useful-- I have really been stretching myself trying to teach this science in Spanish. I have no academic Spanish language whatsoever.

So just really struggling to help our kids figure it out. So what we did was we-- this is the chromatography where-- if the color dye molecules could come up here, and then the whole class would come behind them.

So the water molecules are the white pieces of paper, and they're going to come through the color and just grab one of the color molecules and drag it knowing that the red is going to be so heavy. They're going to drop it off first, and then come through and grab another color, and come through and grab another color.

[INTERPOSING VOICES]

OK. And then there were a bunch of white pieces of paper left behind that didn't pick up color molecules, and then this showed the distribution of the patch that's carrying the color molecules for you. Thank you volunteers.

[APPLAUSE]

SPEAKER 2: Thank you.

[INTERPOSING VOICES]

NICOLE: Thank you.

SPEAKER 4: Thanks. Oh. Check you're piece of paper backwards.

NICOLE: Sure. It's probably something important. And then the other one that we did was-- again, I don't know how to say backpack in Spanish. So Harry got on a stool. I did not get on a stool.

So we're trying to explain one of the things that kids talked, or thought, that maybe one of the properties was the weight, or mass, of the molecules that were causing them to travel different distances.

So we all put on our backpacks. We were water, and we put on our backpacks of blue molecules, red molecules, or yellow molecules, and started climbing up this big hill. They're so heavy, so heavy. Also we have you have to stop, and then the yellow could continue, and then blue can continue and get further [INAUDIBLE].

SPEAKER 2: I know that we talked about this before I did it. But you were also modeling to them as you were stopping, and you were doing like, I need to take something out. What am I going to take out?

And we're just eliciting from the kids of the idea of, Oh, OK. So if you have something heavy in your backpack, that's what you're taking out first, rather than something lighter. And so it started as that teacher demonstration, and then went to a whole class demonstration just to get a little bit more active movement in for kids. And then later on we saw that there was the all aboard model.

[INTERPOSING VOICES]

SPEAKER 4: And then after we did that, then they went back and did their nanovision models. So these are some examples from my class, but they started adding-- I think you call them textboxes, little labels as to why they ended in these certain places.

[MUSIC PLAYING]