

## **Math in Action**

### Benefits of Maker Space

>> It takes a lot of scaffolding to get students to that independent point when they're down in the space, because that was kind of my goal. I'm, like, this is great, but really I have to step back and think about how I'm going to get there, with them being able to say, "Okay, I need to use this part of this space, for this reason." "I need to go over here to use this, for this reason." So at the beginning of the year, I really push kind of that entrepreneurial thinking mind-set, so I got them to establish kind of what skill set they had that would contribute to them being a part of a team. So there's been a lot of group work down here, and sharing of ideas to get them to kind of move forward. So they had opportunities to say, "Okay, I need to go into the maker space because I need to prototype this." Or, their whole group would be prototyping an idea. Or, "Miss Linton, I need to use a whiteboard to just figure out this one problem I've encountered." And I'm, like, "Great! Go ahead and do that." So to see that they're at that point now is great that they can advocate for their own learning needs. It was even planting seeds as we've gone through the past six years, really, because that's given us this whole transition at the school, which has been neat. It was really kind of tapping into why we're doing it. And because teachers were already doing some of that in their classroom, the quality of work and the level of brainstorming and problem solving that was coming out of the students finally gave us a reason to say, hey, why don't we just have another space where students can go and explore, and kind of expand even further. Because down here, compared to classrooms, there's an opportunity to have a lot more resources, like the Lego Wall, or the Green Screen, the maker space itself and the materials that are available. So it was finally time to do that, which was great. For me, I have to admit, the Lego Wall has been an awesome tool to having this maker space. So for some students who need to just get moving, or they have an idea, getting it down on paper was maybe not their strong point. I was, like, "Why don't you just go try that on the Lego Wall," or, "Do you see another space in here that might help you?" It might be throwing up an idea on one of the whiteboard spaces that we use around the maker space innovation lab. So it's been neat for me as well, and very easy to diversify for the needs in the classroom with having all these tools down here.

>> This past year, the school also offered an innovation club for students in grades four to eight, who enjoyed creating and learning in the mixed use space.

>> It's been a neat way, again, for students to apply what they're learning in class, extracurricularly and taking more and taking more ownership over their own learning. They've had a chance to walk around the school, identify maybe some problems or challenges that they're having, how can we solve these problems? And it's very school problem-solving based, which is exciting. They've used Google Docs to show some of their ideas. They've also done it on paper, different brainstorming templates we've had. They get to use whiteboards in the maker space to kind of support some of their thinking, or if they've come to a challenge, they kind of just hash it out on the whiteboards as well.

>> Megan says she enjoys seeing students' ideas grow, as they realize the real-life application of the maker space.

>> The benefits of, I think, learning this way down in this space is it provides the students with a real-life context. So knowing that, yeah, you're going to try something, and it's not going to always work out. But how do you reframe that? How do you learn from that? How do you apply that to something that's different? So I think it really generates a real-life experience for the students here. My role has changed and evolved because of the students. I think it's so nice for me now to take a look back at where I started and being very, yes, I need to get all of these curriculum pieces checked off, but reframing that piece for myself as an educator. So thinking, okay, yes, the curriculum does drive what we do, but it's being open to exploring different avenues. Me being more comfortable with the curriculum, and being able to tie real-world problems to that and providing that to my students. It has re-invigorated my practice in many ways. I find it exciting to come to work. I think now, being a teacher today, is marvellous. I also have to give a lot of credit to my administration, too, who supports my risk-taking, and allows me to try ideas, even if it doesn't work. But then I have this reflective piece that I go through to inform my next steps for instruction. I know that students are learning when they are left to do group tasks independently, and their conversations are still on task. That's always the highlight of my job, knowing that, okay, we have to give them freedom to do what they need to do as well. So when they are accountable for their time, it's always exciting for me down here to see that. What we do is a lot of community thinking. Students share a lot of ideas on the walls. We started right off the beginning of the year identifying what their skill set was, and how does that contribute to team work and group work, in order to get your work done? And with my schedule, our times together are quite short. So it's how do we maximize this time, and honour everybody's ideas at the same time and still move forward?

>> One of the challenges, I think, of education, and it gets more problematic as you get at higher and higher levels of education, is making your teaching actionable on behalf of the person. So if you give somebody an idea, but they can't take action on it, maybe it's slightly better that they had the idea than not, but not a whole lot better. The way to make things practical and actionable is to actually have students work on a real-life problem that's meaningful to them. That way, they can learn the concept and not have to try really hard to imagine how they would actually do that in real life. They can, while they're learning the real problem, be practicing on something that's meaningful to them and meaningful to their lives. And we think the learning will both be better, because they will learn by doing and it'll stick, right, they'll always be able to relate to, here's what we did when we were working on a real problem that mattered to us. And the other thing is, it just aids in the motivation. All the groups that I've watched do work who all work on something that's meaningful to them, they're just massively motivated. They want to get to a better solution. And the food bank would be a perfect example. They wanted to get the better solution, because some of their families use the food bank. Friends use the food bank. They wanted to make the food bank experience better than it was now,

and that provided lots of motivation. So motivation, sort of enconcing the learning, and making the learning less abstract. One reason we used live cases for which there is no current solution, and they're difficult, seemingly intractable problems, is because actually, we are brave, because we think our students are brave and can do it. So often people use cases where there is a solution where you can guide the students to the solution. And the teacher can feel it will be no problem, I know how to guide them to a known solution. I don't think that's very brave. And I don't think it expresses a maximum level of confidence in the students. We choose a method that says, we believe in them. They'll be able to come up with something. They won't end three weeks or three months of work feeling frustrated because they couldn't come to an answer, therefore, the methodology doesn't work. Nope. We have confidence. They're brave, we're brave, and it works like magic.