21st Century Teaching and Learning
Extending Student Learning
Ottawa-Carleton District School Board

TEACHER: 3…2...1...Go!

NARRATOR: Racing trials are underway for Trina Legault's grade 8 science class at Glen Cairn Public School in Kanata. Students built these mousetrap cars themselves, and used technology to help guide their design process.

TRINA LEGAULT: A lot of the students didn't necessarily always go to the textbooks for things. They found some videos online. They found some YouTubes. They outsourced some different resources by looking things up on phones and on different forms of technology, and from that, kind of brought in their own creative content.

NARRATOR: Legault ensures her students are engaged in deep learning. Their discussion focuses on taking this lesson, and making real world connections to other mechanical, environmental and societal systems.

TRINA LEGAULT: "What's another example of another system we've taken a look at that could compare to something like this?"

STUDENT: " A library?"

TRINA LEGAULT: "Ya, how is it like a library?"

STUDENT: "Well the input is people who want to go and the output is people who have received the information."

NARRATOR: Students built their cars using materials like wood and CD's. But some were inspired to take a different direction.

TRINA LEGAULT: There were some students who went a little bit further and beyond and said, "Can we integrate some of the things we're currently doing with our robotics or we're currently doing with the Makers' Club and incorporate that into some of our learning?" So, they made those connections themselves. I encourage them to do that and the creativity that comes out is great.

NARRATOR: This student drew from his experiences as a member of the school's Makers' Club. He extended his learning, designing the chassis of his group's mouse trap car using software called SketchUp and printing it on the school's 3D printer.

STUDENT: I got to 3D print something that was really strong. It was one object and it was really light because it was hollowed plastic.

NARRATOR: Using technology deepened his learning and problem solving skills, as he used trial and error to recreate the piece more than once, in order to achieve a successful design.

STUDENT: Our first design, the axles were supposed to go there and there. Now, what happened was there were no holes for the axles there. We tried to make them and it completely destroyed the chassis. So, we decided to redesign it. That's when we came up with our second design. It's a new way of looking at learning, not the traditional sit down, textbook.

NARRATOR: The Makers' Club, which has expanded to include coding and robotics, meets a few times a week on their lunch. They use technology in innovative ways to solve problems and become creators.

STUDENT: My game is basically you move the mouse along and your little guy is going to move. You have to avoid the enemies.

DOUG COMMONS: I think the ability to dissect an idea and break it down into its constituent parts and figure out a process to solve a problem is a life skill. Taking apart printers - it's an awesome exercise. Figuring out how to get that thing apart tells you how someone put it together. You have to think about how that actually was constructed and you learn something about the way other people think.

NARRATOR: Principal Shannon Smith saw an opportunity to start this club as her school continues to integrate technology in the classroom.

SHANNON SMITH: We wanted students to still be able to make and create and wanted to provide as many opportunities for kids to develop those skills as we could. The use of technology here has helped develop things like opportunities for collaboration, for students to develop some digital fluency. So the students are really taking the lead. They're learning about these technologies in the clubs and they're bringing it into the classroom and then the teacher's eyes are being opened to the possibilities.

STUDENT: I love building things now and trying to take apart things and, I guess, have my own unique way in life. And I think Makers' Club has certainly changed my life and how I've seen the world.

NARRATOR: Smith also saw the benefits of including community leaders in the club to share their expertise. Retired engineer, Greg Reynolds, came to support students in his community after reading about the club in the newspaper.

GREG REYNOLDS: When I've come I've actually gone down the hall and I've had one kid say, "Is there Makers' Club today?" and I'll say, "Yes there is." "Yay!"

I hope in a way they can look and see "Gee, here's somebody that actually made a living doing this." and they could look at that and say, "Gee, maybe this is something I'd like to do."

NARRATOR: The next day Legault has her students use success criteria to self-assess their designs.

TRINA LEGAULT: Assess yourself in your process, not in your product.

STUDENT: We probably should have put more support on the bottom.

NARRATOR: And share their feedback on how technology supported their learning.

STUDENT: I'm giving myself some points on the 3D printing design just because I thought that was kind of a cool idea. But definitely I lost a lot of points for, first of all, for the front axles - the holes not lining up, so it curved.

NARRATOR: Legault says student-driven learning is an integral part of creating community knowledge in her class.

TRINA LEGAULT: They've been able to answer their own questions as a result of collaborative learning between them. Our discussions, we do a lot of accountable talk in the class. And often I'll throw it back at them. If we can't figure this out, how can we find it out? Where can we look or who can we ask? Sometimes it's a community member. Sometimes it is the internet. Sometimes it's each other, which has been really, really neat to see.

NARRATOR: Smith has created a culture where devices are not excluded but regulated, and thoughtfully integrated for blended learning.

SHANNON SMITH: We are really saying to students, we want to provide the environment to support you in truly collaborating with your peers, in using technology responsibly to support your learning, and to think about yourself as a global citizen as opposed to just a citizen here at Glen Cairn.

[MUSIC]

TEXT ON SCREEN: "It's a new way to look at learning…" - Student

TEXT ON SCREEN: This was a glimpse into an Ontario classroom that is part of a province-wide collaborative research study on effective technology-enables teaching and learning practices.