

# How to build a better trebuchet

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The assignment was to build a trebuchet, a kind of medieval catapult, and bomb the cardboard castle with marshmallows.

But before the teams of students were allowed to start tinkering with their materials – bits of jinx wood, string and glue – they had to brainstorm 50 ideas in 20 minutes about how to do it.

This problem-solving technique, which was developed at one of Canada's most competitive business schools, is being introduced for the first time to students in kindergarten through Grade 8 at Ledbury Park Elementary and Middle School in North York. Five Toronto private schools, including Branksome Hall and Upper Canada College, began integrating the Rotman School of Management's I-Think program into secondary and middle-school classes in recent years, but the Toronto District School Board is the first to integrate it at the elementary level.

It made for better trebuchets in Brent Charpentier's Grade 8 classroom. One had perfect accuracy, and another launched a marshmallow 7.65 metres.

The students initially balked at the thought of generating 50 ideas, but later said the exercise made their thinking more bold and creative.

"It really got my brain running," 14-year-old Sam Rabinovitch said.

The brainstorming deadline made his mind reach for far-flung ideas. Sam found himself considering how baseball players attach weights to the end of their bats during warm-up, an idea that inspired his team to attach pennies to one end of their catapult.

Mr. Charpentier has been teaching for 12 years, and he's introduced innovative hands-on projects like homemade trebuchets to his classroom before. But the I-Think technique helped this year's students be more brave and creative than those in previous years.

"It takes them away from thinking, 'What do I have to do to get that mark?' " he said.

Mr. Charpentier said the training was some of the most valuable professional development he's ever done. It introduces teachers to methods that help put the emphasis on process over outcome. Students learn better problem-solving and creative-thinking skills and become more comfortable exploring complex issues.

The changes to the lessons are subtle, and generally have teachers adjusting the way they assign and discuss problems.

Kindergarten students have been asked to compare Styrofoam boats made by their classmates with an eye for integrating best practices. Grade 3 students have been comparing classmates' solutions for word-based math problems.

Consultation and collaboration can be especially difficult for young children, and these methods can have a huge impact in an elementary school setting, said Ellie Avishai, the former educator and Rotman graduate who helped adapt the I-Think program for schools.

“If you ask a group of seven-year-olds to build a bridge out of popsicle sticks, the bridge will only be as good as the loudest kid in the group,” she said.

I-Think aims to teach students how to tackle problems collaboratively by avoiding either-or comparisons and integrating ideas.

It helps them learn skills that are highly valued in a changing job market, one that will likely be unrecognizable by the time Mr. Charpentier's students graduate from college or university.

Ledbury Park is a feeder school for John Polanyi Collegiate, which introduced Rotman's trademark approach last year. One year in, teachers are noticing a change.

“They're seeing a difference in the kids in that they no longer settle for the easy solutions,” principal Aiman Flahat said.

Sixteen of the school's staff – nearly half – have completed the I-Think training, and 35 students have done a new business leadership course that teaches some of the theory behind the approach. There were familiar elements to the course, such as tests on business theory and presentations that tackled real-world problems, but some of the homework assignments were highly unusual: They included taking extreme positions on issues, ignoring the input of others and saying yes to everything.

Students insist it wasn't a “bird course.”

“It's helped me make decisions, even pick a university,” said Hamdi Ahmed, 18, who hopes to study computer engineering at Ryerson in the fall.

Teachers from Lakeshore Collegiate Institute also participated in the latest round of I-Think training, which finished in April.