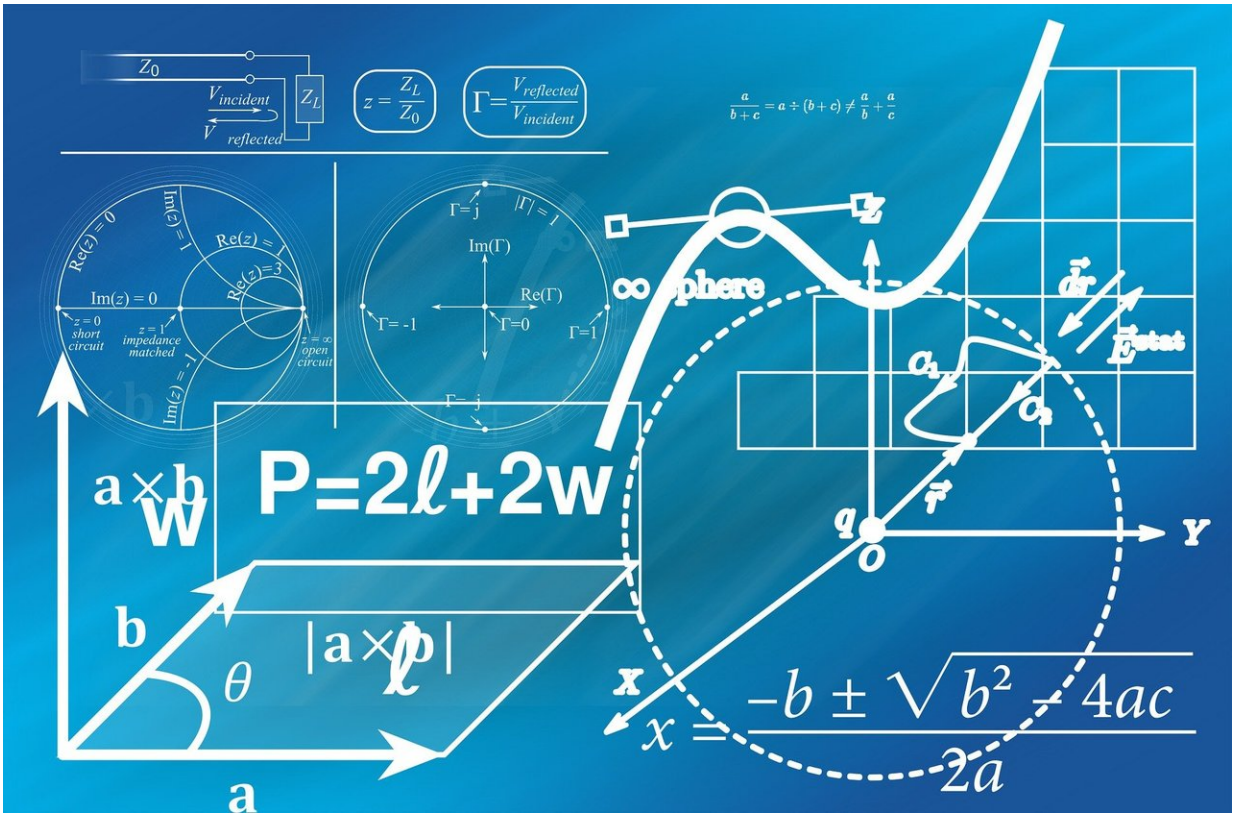
Let's teach students why math matters in the real world

September 12 2018, by Edward R. Howe



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"When will I ever use this?" It's a question math and science teachers hear all the time from their high school students.

Teaching science, technology, engineering and math (STEM) skills is more important than ever, but it's often difficult for students to understand the practical applications of such fundamental learning and how it will help them down the road.

Classroom activities should be relevant, meaningful and connected to students' prior knowledge and experiences. Learning must be based on lived experiences within both formal and informal educational settings.

Increasingly, teacher educators are realizing that we must break away from traditional silos of courses, disciplines and formal schooling. Educators must lead by example and provide students with opportunities to explore interdisciplinary approaches to learning.

Creative thinking

The new British Columbia curriculum embraces these principles of learning. In the same spirit, I'm part of a new and unique Bachelor of Education program at Thompson Rivers University where teacher candidates are learning to teach STEM by actively engaging students. The program promotes cross-curricular and interdisciplinary approaches to learning and is tied to the provincial curriculum core competencies of communication, critical and creative thinking.

So how do you teach a subject like math differently in a way that can help students learn through creative thinking and experience, rather than rote memorization?

Let's take, for example, Pi.

I often ask my teacher candidates: What is π? Many respond "3.14" and, if probed further, explain the meaning by merely stating an equation like $A=\pi r^2$ (where A is the area of a circle and r is the radius of a circle). Or

they may tell me C=2πr (where C is the circumference of a circle).

Teaching through discovery

I encourage these teacher candidates to think differently and to help students discover mathematical concepts for themselves. What better way to teach students that π is the ratio of a circle's circumference to its diameter than to have them trace any circle and then measure it with a piece of string?

They will soon learn that regardless of the size of the circle, the ratio of circumference to diameter will always be 22/7 (approximately equal to π).

Innovative educators can integrate history, geography, math and science lessons by teaching a thematic unit on ancient civilizations.

For example, the Egyptians succeeded in building great pyramids with incredible precision and accuracy. These magnificent architectural accomplishments have stood the test of time, remaining largely intact after centuries —a tribute to their construction.

The ancient Egyptians understood the significance of mathematics through the very beauty and symmetry of nature. They used geometry to solve everyday problems.

Tearing down silos

Increasingly, teacher educators are realizing that we must break away from traditional silos of courses, disciplines and formal schooling —exactly the opposite of the "back to basics" approach suggested by populist politicians like new Ontario Premier Doug Ford.

Students benefit from learning experiences that are meaningful, relevant and well-connected to their own experiences. For that to happen, the people teaching those students must be prepared to take on new attitudes of reflectiveness and inquisitiveness.

What is necessary is to follow in the footsteps of the great thinkers like Galileo and Newton, who questioned our perceptions of reality and sought answers from tactile experiences rather than textbooks or teachers.

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