
Joy in university math classes

La joie dans les cours de mathématiques à l'université

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MUHAMMAD AWAIS, University of Victoria

Guessing & Graphing Trig. Functions

For students with weaker math backgrounds or those returning to math after a break, teaching math topics through interactive activities can make learning both easier and enjoyable. One such example is function transformations on trigonometric graphs!

BREAK,

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EGAN CHERNOFF, University of Saskatchewan

The Perplexing Power of Pop Quiz Pageantry

Come walk a mile in my students' shoes. My students: future teachers of elementary and secondary school mathematics. Their task: a pop quiz given during the first few minutes of the very first day of the semester. Our task: answer a few questions from the pop quiz, engage in a bit of "what do you think they thought" discussion, and see how doing the quiz twice, first alone then second in a group, along with some of my "patented" pop quiz pageantry, turns one of the most feared math class activities into, of all things, a fun and joyful activity that acts as an important callback throughout the rest of the semester. Fair warning: my dog has already eaten the answer key to the pending pop quiz questions you will answer, and please be prepared to work in small groups.

ROUNDTABLE DISCUSSION,

PARKER GLYNN-ADEY AND SAMIRA GODER, University of Toronto (UTSC)

String Stars: A Joyful Ending for a Class

Our activity will teach participants to make a string star. This string figure was originally made in Japan, but connects to the universal childhood pastime of playing with string. The activity of making a string star connects students' lived experience of playing cat's cradle in childhood to their university education. In our teaching, we use this activity as a means to end a course and create a lasting memory of joy in the mathematics classroom.

CHRISTOPHER HEGGERUD, University of Manitoba

The joy of getting stuck in traffic

In this activity I let students hypothesize, model and experience what factors cause a traffic jam! This particular activity was originally designed as an introduction to mathematical and numerical modelling! We explore why traffic slows down only for

it to speed up again mysteriously, how our models can inform road design and speed limits, and how navigation apps decide what colour a route should be. Come prepared to move around, unless you get stuck.

BURCU KARABINA, University of Waterloo

Thinking Dice

Engaging students in meaningful mathematical thinking often begins with inviting them to play. In my calculus classes, I use a simple tool I call Thinking Dice: oversized dice with transparent side pockets that hold interchangeable prompts. Depending on the lesson, the dice become a lesson opener, a reflective closing activity, or a way to guide students through “thinking levels.” Each roll creates an element of surprise and curiosity, encouraging students to articulate reasoning, make connections, and explore ideas collaboratively. This brief presentation will showcase how “Thinking Dice” brings joy, creativity, and active learning into the calculus classroom.

THOMAS KIELSTRA, University of Toronto

Sweet Shots, Sharp Concepts: Teaching Piecewise Derivatives with a Marshmallow Gun

In first-semester single-variable calculus, students often find computing the derivative to be quite challenging. This is especially true when working with piecewise functions. In this workshop, we will explore how one could use a marshmallow gun as a manipulative to leverage students intuition to gain a better understanding for: why we use a piece-wise function in real world situations; the relationship between average velocity and average rate of change; why the velocity function is a derivative; and how to compute the velocity/determine if it is defined, when the function changes definition with the piece-wise function. In the worksheet we will explore, students are challenged to reanalyse the function, thinking about the acceleration of the marshmallow, when it is defined and why determine if the defined accelerations make sense physically. Finally, we discuss how this manipulative could be used again, later within the same course. As students are learning about initial value problems, students could derive the piece-wise function that defines the position of the marshmallow for themselves by proving force is equal to mass times acceleration and assuming: the marshmallow had no initial velocity; a constant force is being applied while within the marshmallow gun; no force is being applied (horizontally) while the marshmallow travels through the air; and the marshmallow sticks to the wall it hits. We provide the .tex file for both worksheets as well as a parts list for the marshmallow gun.

MICHAEL PAWLIUK, University of Toronto Mississauga

Valentine's Day Gallery Walk

Gallery walks have been a powerful tool in my senior combinatorics class for promoting communication skills, as well as demystifying preconceptions about how others in the class think, approach, and express.

"I thought I was the only one who didn't solve it!" melted into "I'm going to work on this approach." morphed into strategizing problem solving time in a way that will be well suited to achieving and sharing partial results.

In this activity we will do a "Valentine's Day" version of a gallery walk, that promotes connections, social validation, and joy! There will be hearts.