

Engaging liberal arts students in mathematics

Colleen Duffy

University of Wisconsin - Eau Claire

Joint Mathematics Meetings
Jan. 2014

Course Goals

Our course is entitled
"Introduction to Mathematical Thinking."

Some goals of the course are:

- ▶ develop abstract and creative thinking

Background

Math is Fun

Math in Latin
American Cultures

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- ▶ change their perception of and attitude toward mathematics - get them to believe math is fun
- ▶ NOT computationally based

Audience

- ▶ terminal math course
- ▶ counts for GE and math competency
- ▶ music, art, and humanities majors
- ▶ as expected, most students come in disliking or believing they are not good at math

Topics

The topics taught in the course are up to the instructor. The only “rule” is that they are conceptual and not computationally based.

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- ▶ Art: golden ratio, groups, frieze patterns, tessellations, perspective, other geometries

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How I make the course unique and fun is by teaching the math in a story format. We 'travel' to different places and meet various mathematicians.

Examples



- ▶ First day of class we go to Hilbert's Hotel in [Paradox City](#).
- ▶ In [Fractal City](#) Lewis Richardson tells us about the Coastline Paradox, Sierpinski tells us about some fractal constructions, and Mandelbrot tells us about Julia sets and the Mandelbrot set, among others.
- ▶ In the [Math and Art](#) unit we travel around the world.

I incorporate youtube videos, interactive websites, and art projects.

This format really engages the students and helps them remember the material by placing it into a context.

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Out of the Intro to Mathematical Thinking course and my interest in Latin American culture came a new course: Mathematics in Latin American Cultures. It has the same philosophy and goals, but with the added layer of putting the mathematics into a cultural context. Here we do not go to imaginary cities, but ones that have been abandoned.

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This spring will be the fourth offering of the course (the second time as a new course).

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The story/discussion/small group - based style of course has worked very well in engaging the students, encouraging them to think deeply, and 'forcing' them to learn a lot.

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By the end of both of these courses, all of the students have a changed perception of what mathematics is. Furthermore, most agree that math can be fun.

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I have received many emails from students during and after the course about things they have found/seen relating to the material we covered. They have been a good source for me to add new things to my courses.

Thank you

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Acknowledgments: Thank you to the Mathematics Department at UW-Eau Claire for its support.