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A Mathematical Circus

By Tim Chartier

A circus draws ladies and gentlemen, boys and girls to see wild animals perform awe-inspiring feats, to laugh at the clowns, and be awed by the skilled acrobats. At the recent 2009 World Science Festival crowds gathered to be delighted by feats of mathematical computation, humored by unexpected mathematical results, and surprised by mathematical ideas. Indeed, a mathematical circus, of a kind, debuted in the shadow of the New York City skyscrapers that were built with engineering, and mathematical and architectural prowess. The engaging, hands-on traveling exhibition called Math Midway raised its tents and splashed its colorful displays for all to see. Soon, the crowds gathered to engage in the 4000-square foot exhibit consisting of 3,500 square feet of Promenade exhibits and four surrounding ten-foot-square booths.

A variety of displays fill the main promenade area. From tiles in the shape of monkeys to a maze that has a complete route requiring only left turns, youth and adults explore mathematical ideas. A main attraction of the exhibit is a circular track in the shape of a large sunflower. On it rests two bikes with square wheels where participants pedal on the petals! To many bikers' surprise, the ride is smooth even with the bumpy petals and square wheels.

Enjoying a smooth ride on a bike with square wheels. Photograph by Michael Lisnet.

Mathematical insight explains the feat. Each hump in the roadway follows a curve that at first glance appears parabolic. In fact, the shape is the same (although inverted) that a hanging rope assumes. Such a curve is called a catenary, which Junglus proved in 1669 was not parabolic contradicting Galileo's claim. On this roadway, the catenaries perfectly compensate for the movement of the square wheel resulting in the smooth ride. Moreover, each of the bike's wheels is different in size.

Another crowd favorite was the polyhedral puzzle plaza, which offers children and adults a mathematical playground of cubes, noodles, and connectors. Visitors can be challenged by directed puzzles presented in the displays or free to construct using their own creativity. Children and adults work side by side as they interactively explore geometry.

Children and adults play in the Polyhedral Puzzle Plaza.

Interested? These and the other exhibits can be viewed online at http://www.mathmidway.org and are a part of the overall vision of establishing the United States' first interactive mathematical museum, which would be located in New York City. This work is spearheaded by the energetic and creative Glen Whitney, who worked formally as an algorithm manager at the quantitative hedge fund Renaissance Technologies. Among Glen's varied activities are free walking tours of Manhattan neighborhoods to uncover mathematics. He may use a Philip Johnson clock off Columbus Avenue to discuss Pythagoras or the surrounding, bustling traffic to introduce the topic of traffic lights' timing patterns.

Glen does not work alone. A variety of people contribute ideas for the museum on the online wiki http://www.mathfactory.org. Take a look and see what your mathematical knowledge and expertise in teaching can offer! Someday, visitors to New York City may enjoy the performing arts on Broadway, step into history on Ellis Island, and possibly interact with mathematical ideas at a museum dedicated to math. For now, we can all look for the Math Midway traveling exhibit, a mathematical circus, to come to town!

Glen Whitney in the Fun House booth at the Math Midway exhibit. Photograph by Nancy Goroff/The Museum of Mathematics.

References

D. Goldenberg, "Building a Temple to Math," *Gelf Magazine*, April 9, 2009.

N. Paumgarten, "Math-hattan," *The New Yorker*, August 3. 2009.

D. Tao, "The Math Midway Takes Shape. Go Figure," *The New York Times*, June 15, 2009.

O. Yaniv, "New Yorker Glen Whitney quits hedge fund job to create math museums," *Daily News*, June 9, 2009.

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The History of Mathematics Special Interest Group of the MAA is pleased to announce its seventh annual

Student Writing Contest in the History of Mathematics.

Deadline for submissions is March 31, 2010

Information and submission guidelines can be found on the HOM SIGMAA website at http://www.homsigmaa.org or by contacting Amy Shell-Gellasch at shella@beloit.edu.

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