

# Step Right Up for the STEM Carnival!

Science, technology, engineering, and math (STEM) carnivals have become a way for teachers, schools, and organizations to educate students about STEM while they have fun. The STEM Carnival at Mayville State University (MSU) in Mayville, North Dakota, has been held annually since 2011 because of “the increased focus on getting kids into engineering at an early age” and having them experience the “excitement about STEM early on,” says MSU STEM Coordinator Sarah Sletten.

Though the carnival is aimed at “preschool through middle school, all ages attend,” notes Sletten. About 200 to 300 children, parents, and other adults come to the university to engage in STEM activities at 25–30 booths staffed by teacher education students and community members. “We make sure all booths offer hands-on activities. The activities differ each year and touch on all four components of STEM,” she explains.

“We bring in campus science clubs and engineering groups” to do outreach, and “we also have a photo booth with an iPad that people can use to print out photos. We do face painting and provide free popcorn” to give the event a true carnival feel, she observes. “The carnival is fully funded through our STEM budget from the state,” which allows MSU to offer free admission, she adds.

The carnival also involves the Mayville Area Teacher Center, which supports education students and local teachers by providing professional development, instructional resources, and educational equipment. “The Teacher Center has a resource library with STEM kits. Whatever is developed for the STEM Carnival is [later made] available in the resource library for area teachers to borrow free of charge. Teacher education students use a lot of these resources during their practicums and student teaching,” Sletten points out. “Our STEM resource

library is pretty much built on what we have bought for the carnival.”

At Savoy Elementary School in Washington, D.C., students attending the Saving Lives and Minds STEM Carnival learn how they can become STEM innovators, such as “coders, game designers, cybersecurity professionals,” says Cheryl Hart-Johnson, director of Concerned Black Men (CBM) National’s Youth and Prevention Services Division. CBM holds the event “to ensure African American students are equipped for the STEM economy because not enough African Americans work in those fields,” and “to provide a fun environment for kids to fall in love with STEM,” she explains. CBM partners—organizations such as the National Association of Black SCUBA Divers, staff from area technology businesses, scientists, engineers, medical professionals, and other “African Americans who are immersed in STEM”—conduct the activities, she relates.

Savoy’s teachers “provide input to

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**“People are yearning for smart fun.”**  
—Joanne Pentangelo

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the carnival and suggest activities and topics,” Hart-Johnson notes. Activities have included app development, flight simulation, robotics, solar cooking, animation design, and math games. “We even have balloons and music that are science-related,” she adds.

Students leave with “STEM bags” filled with “science experiments they can do at home with their families, information about where the great STEM jobs are, [and] a pamphlet about prominent African Americans in STEM,” says Hart-Johnson. Savoy’s teachers receive contact information for the CBM partners, “in case they would like to have someone return as a guest speaker,” she observes. After the carnival, teachers have said students showed



Children and parents build Rube Goldberg machines using recycled materials at Two Bit Circus's STEAM Carnival in Los Angeles.

“an increased interest in STEM and in academic performance,” she reports.

New York’s Staten Island Children’s Museum holds its carnival as a fundrais-

about them, Pentangelo points out. About 2,000 people attended last year.

## A Classroom Carnival

In March, teacher Nicole Williams-Rouhac and her fourth graders will hold a STEM Carnival for students at Panther Run Elementary School in Pembroke Pines, Florida. “Every year, I get a grant for STEM, and my students and I hold a different STEM event that the whole school is invited to participate in. Last year, it was a golf course,” she relates.

Using inexpensive materials like string, straws, toothpicks, foam pipe insulation, and marbles, her students will create games such as ring toss, skeeball, and coin toss. With her help, they’ll also build a motor-powered ferris wheel and carousel. They will use the engineering design process to “plan, design, create, test, and improve” their creations; “they always have to know they can make it better,” she maintains. They’ll also learn about economics as they use their math skills to make budget decisions.

On carnival day, they’ll demonstrate their creations and let other students

try them. “Students will be graded on how well they use the engineering design process, how well they explained their games, and on their artwork,” as well as on creativity and originality, she explains.

**A STEAM Carnival**

After raising \$102,699 from a Kick-starter campaign, Los Angeles-based engineering entertainment company Two Bit Circus held a STEAM (STEM plus arts) Carnival last October in Los Angeles. The five-day event featured wearable electronics fashion shows; musical robots; acrobats, aerialists, and fire breathers; a stage show with giant Tesla coils that responded to music; and high-tech games. “We realized there was a big need to rebrand STEM, moving away from the traditional stereotype of lab coats and pencil ties, and instead showcasing it as the new rock and roll with a myriad of entertaining jobs,” says former educator and Chief Communications Wrangler Jennifer Jordan, a member of the Two Bit Circus team of inventors, engineers, educators, artists, and entrepreneurs who planned and created the event. “Art is a critical piece to attract kids to STEM,” she contends.

“If you really want transformative change, you have to involve the teacher,” Jordan asserts. She and a team of former educators and learning specialists “helped create and define the [event’s] learning pieces” based on feedback from educators, students, and STEM professionals who attended Two Bits Circus’s pre-carnival STEAM-STER workshops, she relates. Held as part of Two Bit Circus’s developing STEAM certification program, the workshops are accredited by University of California, San Diego.

STEAMSTER workshop participants then provided instruction during Student Preview Day, which attracted 2,800 students and teachers. Teachers received a curriculum packet with videos, vocabulary, and links for “a deeper dive into STEAM learning,” explains Jordan. Two Bit Circus also gave all Student Preview Day attendees a free ticket to the weekend carnival.

Two Bit Circus will hold another STEAM Carnival in 2015, “likely in San Francisco,” she reports. ●

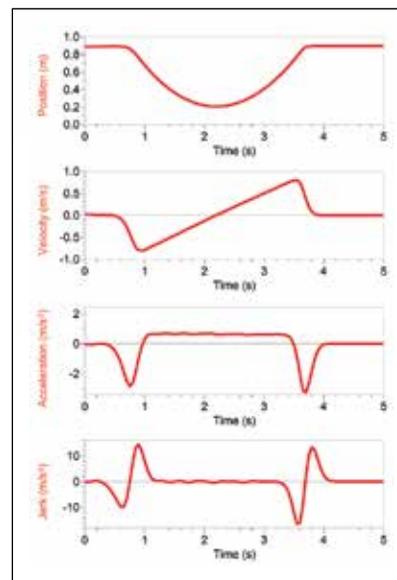
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## Quotable

**Kids should be allowed to break stuff more often. That’s a consequence of exploration. Exploration is what you do when you don’t know what you’re doing. That’s what scientists do every day.**

—Neil deGrasse Tyson, U.S. astrophysicist and science communicator