

Township High School District 211's Girls in Engineering, Mathematics, and Sciences (GEMS) Conference

Pathways Spotlight Briefs

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Joel R. Malin, with Collaborating Educator Sharon McCoy

Township High School District 211

Grade Levels: 9-12
Students: 12,362

Township High School District 211 (District 211) is the largest high school district in Illinois. It serves most of the Palatine and Schaumburg townships, including the communities of Hoffman Estates, Inverness, Palatine, and Schaumburg, and significant portions of Arlington Heights, Elk Grove Village, Hanover Park, Rolling Meadows, Roselle, Streamwood, and South Barrington. Its student body is racially and ethnically diverse. Approximately 3.6% of students are English Language Learners, and 29.3% of students are eligible for free or reduced price lunch. Each of its high schools has been named among the finest in the nation in the United States Department of Education's National Blue Ribbon School Recognition Program. For additional information regarding District 211, please visit the district's [website](#) or the [Illinois Interactive Report Card website](#).



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The Girls in Engineering, Mathematics, and Science (GEMS) Conference

This brief describes District 211's annual GEMS conference for 5th and 6th grade girls and their parents. This brief also outlines numerous benefits of this conference for its participants.

Encouraging Girls to Pursue STEM Educational and Career Opportunities

On a Saturday in February, since the 2010-2011 school year, District 211 has hosted a GEMS Conference for 5th and 6th grade girls—their prospective students, those currently enrolled in sending elementary school districts—and their parents. The conference was inspired by a similar event that was sponsored by a neighboring district, Niles Township School District 219. A small team of educators, led by recently-retired former Assistant Superintendent of Instruction Theresa Busch, brainstormed and collaborated to bring the first conference to fruition. Since that time, a team of educators has seen conference participation grow steadily and impressively, from about 100 students in the first year to 200 in February 2014. Currently, Associate Superintendent Dr. Lisa Small oversees the conference and committee members representing all five District 211 high schools.

It is widely known that U.S. females are underrepresented in STEM careers (Gioiosa, 2014), and educators are pivotally positioned to remedy the issue. Accordingly, Mrs. McCoy and her partners envisioned a conference that would “get girls excited about STEM careers” while also opening parents’ eyes to their children’s prospects and the ways in which they could support them. The conference has continued to evolve but has tended to include the following components:

- a welcome and introduction, often provided by a district leader;
- a career expo, enabling parents and girls to communicate directly with a variety of STEM professionals about their careers;
- a set of experiences geared directly for parents, including hands-on learning opportunities, dialogue about parents’ roles to promote STEM education, and/or dialogue about college student experiences in STEM fields;
- a set of experiences geared directly for students, including hands-on learning sessions that are each about 25-30 minutes in duration and therefore require a “quick burst” of action; and
- closing remarks and raffling of prizes.

Recently, an additional component was added: a fun “Parent-Child Challenge” to build the tallest possible free-standing structure out of marshmallows, string, spaghetti, and tape. Learning session topics included the following: 3D Modeling, Polymers, Forensics, Environmental Science, Engineering, and Food Science. These learning sessions are led by “women in the field,” such as food chemists or forensics professionals. High school students also participate, working some of the sessions and serving as buddies and role models to the participants.

The conference activities align closely with several recommendations for educators intending to overcome gender inequities in STEM. Its career expo increases students’ exposure to nontraditional careers, its expo and learning sessions provide students with access to nontraditional role models, and its recruitment efforts proactively target girls (Gioiosa, 2014).



COLLEGE OF EDUCATION AT ILLINOIS

Impact on students. The 6th grade students who experienced the first GEMS conference were in their first year of high school in 2013-14, so long-term impact data are still emerging. Educators expect that this program, and related efforts, will promote greater female participation in STEM offerings, in core classes as well as Career and Technical Education (CTE). Indeed, enrollment trends in Project Lead the Way (PLTW) and Introduction to Engineering Design coursework are highly encouraging. In 2014-15, for instance, PLTW enrollment by female students has reached 25%, which is part of a large (+92%) and steady change from the 13% enrollment in 2010-11. Likewise, female enrollment in the Engineering Design course has reached 30%, which translates to a remarkable 131% increase from the 13% shown in 2010-11. Meanwhile, the feedback collected is suggestive of highly engaged and appreciative students and parents. Lastly, the vast increase in participation (from 100 initially to 200 most recently) suggests that the program is filling a vital niche.

Other benefits of the conference are less obvious but equally important. The GEMS conference entails a wide array of business/industry partners and the conference strengthens relationships among these partners and educators. The conference is a tangible occurrence and may open the door to more joint activities (e.g., work-based learning opportunities, job shadowing, internships, classroom visits) in the future. Also, the recruitment efforts put District 211 educators directly in touch with educators in the sending elementary school districts, which may function to open or enhance lines of communication while modeling strong equity-conscious behavior. High school girls also are able to serve as role models for the 5th and 6th grade female students.

“You need to be hands-on, you need to be exciting! We are trying to get [the girls] excited about science.”

~Mrs. Sharon McCoy, Science Department Chair, when asked for advice to those considering implementing a similar conference/program

Key points. Mrs. McCoy emphasized the importance and popularity of offering interactive, hands-on activities for students. Related, she stressed that learning sessions in which participants “can make something and take it with them” are invariably popular. The planning team, foremost, has wanted to provide an experience that would show that STEM careers/activities are wide-ranging, within reach, and fun and exciting. They have also strived to bring in female professionals who represent a variety of careers, so that students could begin to explore different employment options and learn more about what they do and do not enjoy. The career expo, too, provides a strong opportunity for interacting with professionals, building knowledge and social capital in the process. Lastly, the focus upon parents is pivotal, because parents and educators are best positioned to jointly nurture students’ developing career interests and to encourage them to pursue their highest aspirations. If parents come away with relevant knowledge and skill related to STEM career options, their children will profit. Mrs. McCoy shared that the conference requires a lot of planning and preparation, but ultimately it is “a blast” and is well worth the effort.

Program notes. Mrs. McCoy highlighted the generous donations of materials and prizes and other sponsorships supported by local businesses and foundations, enabling the conference to be offered free of cost for all interested students. The conference’s growth in popularity has brought with it formidable challenges, in terms of time, space, and monetary resources, but to this point they have met the challenge. Mrs. McCoy stressed the importance of actively pursuing and nurturing these partnerships and noted that it can be a challenge to continually identify partners and donors. Each year, GEMS organizers collect and reflect upon feedback as they consider future changes. One consistent finding has been that both students and parents especially appreciate active, hands-on activities during learning sessions.

Reference

Gioiosa, C. (2014). *Gender equity in CTE and STEM education*. Champaign, IL: Office of Community College Research and Leadership. Retrieved from <http://occrll.illinois.edu/wp-content/uploads/gender-brief.pdf>

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