



MathScience Innovation Center
Imagine. Create. Lead.

A Consortium of 8 Public School Divisions
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August 21, 2009

21st Century Engineering Fellows – Building the Future

As part of a partnership formed in 2007 between ACEC/VA and the MathScience Innovation Center, the second Engineering Fellows program kicked off on August 3rd of this year. Seventeen middle school teachers from the MathScience Innovation Center Consortium Divisions and two from Scott County were nominated by their school divisions to be trained as “master teachers”. Also observing were two rising senior student interns from the Virginia Commonwealth University’s School of Engineering. This educator training will have a significant impact, not only with Central Virginia school divisions, but now state wide. As we work together to establish middle school student programs, the strength of support from ACEC/VA is unparalleled.

From August 3 -14 these master teachers received in-depth instruction, participated in panel discussions, conducted design and build activities, and visited engineering sites. MathScience Innovation Center faculty Bill Rhyne, Kristine Vester and Echol Marshall coordinated the two-week event and taught model lessons that illustrated how to integrate engineering into the curriculum. Twenty-six volunteer presenters from eighteen ACEC/VA member companies provided information on topics including the need for engineers, fundamentals of engineering, career paths, engineering and the environment, the design process, and structural engineering. *21st Century Engineering Fellows* visited ongoing and completed sites at the Virginia Museum of Fine Arts (Hankins & Anderson), the VCU Dental School addition (Dunlap Partners), Robins Athletic Center at Collegiate School (CHA), Half Moone Cruise and Celebration Center (Clark Nexsen), Proctors Creek Wastewater Treatment Facility (Royer/Malcolm Pirnie), Pocahontas Parkway Connector (Dewberry), and the Air Force/Navy Dormitory at Ft. Lee (W.M. Jordan, Wiley and Wilson).

These master educators are now recognized within their school divisions as *21st Century Fellows* and are charged with assisting with professional development programs and piloting curriculum materials. They will develop virtual field trips for the sites they visited, which will appear on the MathScience Innovation Center web page at www.msinnovation.info and be accessible to the public. Virtual field trips will include pictures, text, video, activities and links related to engineering and each specific site. The *21st Century Engineering Fellows* will also develop at least two engineering related lessons for their students in the 2009-2010 academic year and serve as presenters in professional development programs for peer educators in their school divisions and at the annual dissemination conferences for both 3-5 educators and 6-12 educators at the MathScience Innovation Center in June 2010. Two school divisions already hold summer engineering camps for middle school students as a result of this partnership and the first round of master educators who completed the *21st Century Engineering Fellows*

Program in 2008. We are excited to watch this footprint continue to expand as this year's Engineering Fellows return to their divisions and implement programming.

Teachers gave the program strong marks. Tricia Webb, a Hanover educator, summarized the experience.

"The field trips and speakers were fantastic! Seeing real world applications of things I teach in Physical Science will make me a much better teacher. The speakers input on what makes a "good engineer" makes me think of all the students I wish I could run into again and suggest they may want to think about engineering as a profession. I won't miss the opportunity to make that suggestion again. In other words I will look at my students with a clearer image of their potential to be an engineer."

The future need for engineers in the United States is great. Spreading the word to educators and showing them ways to incorporate engineering into the curriculum is a challenge. Teachers in Virginia are under pressure to meet the criteria of the *Standards of Learning*, which do not specifically address engineering, and like teachers everywhere, are limited by time and resources. The partnership between ACEC/VA and the MathScience Innovation Center enables us to mobilize resources to impact students. We bring together educators and engineers to enhance teacher knowledge of engineering careers, challenges and obstacles to better guide their students in paths of study. The *21st Century Engineering Fellows* will engage students with strong, current and progressive examples of engineering in Virginia, while sparking their creativity for tomorrow's possibilities. We take this opportunity to expand engineering concepts from an "enrichment topic" to an integral part of the 5-8 curriculum that is directly tied to state and national standards.

The Engineering Fellows include **Richmond Public Schools** teachers Felicia Artis-Brown, Larry Mullen and Denis Stanton from Elkhardt Middle School, Pamela Barner from Henderson Middle School, Theodore Barnett from Oak Grove Elementary School, Marcia Swaine-Hanson from Boushall Middle School and Wanda Wilder from Huguenot High School; **Chesterfield Public School** teachers Stephanie Burton from Providence Middle School, Matthew Parks from Manchester Middle School, Preston VanderRoest from Bailey Bridge Middle School and Azam Bejou from Falling Creek Middle School; from **Hanover County Public Schools**, Stephanie Poyer and Patricia Webb from Stonewall Jackson Middle School; from **Henrico County Public Schools**, Robert Lotze from Moody Middle School and Pamela Scott from Elko Middle School; from **Petersburg Public Schools**, Emerlina Binuya and Maria Victoria Yabut-Diaz from Peabody Middle School; from **Powhatan County Public Schools**, Scott Bailey from Powhatan Junior High School and Nina Cox from Pocahontas Middle School. Also, this summer for the first time, the program has been expanded to include **two teachers from southwest Virginia** because of ACEC/VA's statewide membership. They are Jeremy Francis from Rye Cove High School and Adam Meadows from Gate City High School.

The MathScience Innovation Center is a capacity building workforce program for K-12 educators that provides expanded opportunities to learn about emerging fields (fractal geometry, engineering, nanotechnology, environmental modeling) and effective ways to integrate within the curriculum.

Established in 1966 we are one of the oldest examples of regional partnerships in the Metro Richmond area. The MathScience Innovation Center is comprised of eight school divisions: Chesterfield, Colonial Heights, Hanover, Henrico, King William, Petersburg, Powhatan, and Richmond. Going into the 2009-2010 academic year, the consortium's 141 elementary, 46 middle and 37 high schools represent a range of urban, suburban, and rural schools.