



## College of Education and Human Development George Mason University

### Science Test Scores Increase When New Teachers Receive Support

Nationally, there is a growing shortage of science teachers. As a result, many school districts are forced to hire teachers with science degrees but little training in education or experience teaching. These ill-prepared, new science teachers face the extra challenge of discovering how to teach on their own. Without effective support, research shows that 66 percent of these new teachers will quit the profession within three years (Darling-Hammond, 2000, 2003).

The New Science Teachers' Support Network (NSTSN) is a collaborative effort among George Mason University, Fairfax County Public Schools, Prince William County Public Schools, and Arlington Public Schools to help uncertified science teachers succeed at teaching and remain in the profession. Research findings from the NSTSN reveal that **students enrolled in the classes of teachers who received support performed significantly better on the Virginia Science Standards of Learning tests** than students enrolled in the classes of a comparable set of new science teachers who did not receive support. Though the purpose of schools is to help students learn, in some cases the best way to help students is to help teachers.

Policy recommendations from the report, *Supporting New Science Teachers: What School Leaders Can Do*, identify changes that can occur to better support new science teachers as they start teaching. Dr. Donna R. Sterling is the principal investigator and Dr. Wendy Frazier is the program manager. We encourage you to read the report and share it with your school division leaders. See <http://cehd.gmu.edu/crest/researchprograms/nstsn/>

### Student Funding

Mollianne Logerwell received a 20-hour graduate research assistantship to assist with CREST activities and to conduct research on the New Science Teachers' Support Network.

### Graduate Students in Science Assist in Elementary Schools

Science graduate students enhance science lessons and share their own graduate research with students in grades 4-6. For the second year, SUNRISE (Schools, University 'N' (and) Resources In the Sciences and Engineering) fellows, who are graduate students in science, are assisting in elementary school classrooms with science lessons. This NSF GK-12 program is aimed at partnering STEM (science, technology, engineering, and mathematics) graduate students with school teachers. Eight schools in three school divisions (Fairfax County, Manassas Park City, and Alexandria City Public School) are partnering with Mason on this project. For samples of these lessons, visit <http://sunrise.ite.gmu.edu>.

### Motor Mania Summer Camp 2009

Campers, start your engines!! The countdown is on for CREST's "Motor Mania" summer science camp!! From June 22 to July 2, students entering 5<sup>th</sup>, 6<sup>th</sup>, or 7<sup>th</sup> grade will investigate automotive engineering and safety; design, build, and test models; use multiple forms of technology; participate in a Grand Prix challenge; and, visit scientists in their labs. For complete information, including an application form, go to the camp website at <http://cehd.gmu.edu/crest/camp/>.

### Congratulations Dr. Logerwell

Mollianne Logerwell completed her dissertation entitled "The Effects of a Summer Science Camp Teaching Experience on Preservice Elementary Teachers' Science Teaching Efficacy, Science Content Knowledge, and Understanding of the Nature of Science," which examined the impact of teaching in CREST's summer science camp on preservice teachers. Her committee members were Drs. Gary Galluzzo, Wendy Frazier, and Anastasia Kitsantas.

### Virginia Science Standards Under Review

In 2009, the *Science Standards of Learning for Virginia Public Schools* are undergoing review. The first comment period has ended. This summer, the comments will be reviewed and changes to the science standards will be recommended. In the fall, the revised science standards will be open for public comment.

### Collaboration in Elementary Science with Alexandria City Public Schools

CREST continued its collaboration with Alexandria City Public Schools as part of the center's mission to conduct action research in support of local school divisions to enhance the quality of science instruction in Northern Virginia. Based on systematic observation of elementary school science instruction in the division's 13 elementary schools, Wendy Frazier provided Melissa Hamilton, Alexandria's Science Curriculum Specialist, with evidence to shape the division's future professional development efforts.

### Science Teachers Serve as Technology Specialists in Science Methods Course

Learning how to use educational technology is one of the main topics of Mason's advanced methods course for secondary science teachers (EDCI 673). Many thanks to the following inservice teachers from Fairfax County Public Schools for teaching preservice teachers about various content-specific technologies used in science classrooms during Spring 2009: Janet Soules (Earth science) Mount Vernon HS Center, Tony Rugari (physics) Edison HS, Donna West (chemistry) Woodson HS, and Julie Grunwald (biology) Robinson HS.

### Science Education Courses at Mason Taught by Doctoral Students

As an institution dedicated to preparing doctoral students to be leaders in science teacher education, CREST recognizes the importance of providing adjunct teaching opportunities to doctoral students. This spring, Mollianne George Logerwell is teaching the advanced science methods course for secondary education (EDCI 673). Teachers enrolled in the class design and conduct action research to determine how to meet the special needs of students and learn about using science technology in teaching. Please contact Donna R. Sterling ([dsterlin@gmu.edu](mailto:dsterlin@gmu.edu)) if you are at the doctoral or post-doctoral level and wish to co-teach and/or serve as an adjunct professor in science education.

### Awards

- Shannon Waite received the spring 2009 Science Education Leadership Program Award for Science Education master's degree students.
- Tristan Pierce received the George Mason University "We Flip For You" Award for the exemplary work he has done in CREST.

### Student and Faculty Presentations and Publications

- Donna R. Sterling & Wendy M. Frazier (2009, February). *Policy brief - Supporting new science teachers: What school leaders can do*. Symposium conducted at George Mason University, Fairfax, VA.
- Wendy M. Frazier & Donna R. Sterling (2009, February). *Problem-based learning camps for science understanding*. Poster session presented at George Mason University, Fairfax, VA.
- Wendy M. Frazier (2009, Spring). Feature editor's editorial on problem-based learning. *Academic Exchange Quarterly* 13(1), 4.
- Donna R. Sterling (2009, January). From Aristotle to today: Making the history and nature of science relevant. *Science Scope* 32(5), 30-35.
- Beverly Hagberg & Donna R. Sterling (2008, December). Schoolyard geology. *Science Scope* 32(4), 52-53.
- Wendy M. Frazier, Amy Bordeaux, & Donna R. Sterling (2008, December). *Final quarterly report for science explorers: Elementary science staff development*. Richmond, VA: Virginia Department of Education.
- Donna R. Sterling, Wendy M. Frazier, & Amy Bordeaux (2008, November). *Final report for Mathematics and Science Partnership Program: Science explorers: Elementary science staff development*. Washington, DC: U.S. Department of Education.
- Wendy M. Frazier & Donna R. Sterling (2008). Maximizing the impact of professional development for earth science teachers. *Journal of Mathematics and Science* 10, 85-98.
- L. Moore, G. Taylor, & Wendy M. Frazier (2008). Career choices and decision-making of urban African American female participants of an afterschool science, technically related engineering and math (STEM) enrichment program. *The National Journal of Urban Education and Practice*, 1(3), 239-249.
- Wendy M. Frazier (2008). Intelligent collaborations for problem-based learning. *Journal of Virginia Science Education*, 3(1), 18-30.

- Wendy M. Frazier, Donna R. Sterling, Jackie McDonnough, P. Easterling, Woody McKenzie, Juanita Jo Matkins, Randy Bell, & Daniel Dickerson (2008, November). *The best from college/university-based science teacher educators*. Virginia Association of Science Teachers, Hampton, VA.
- Ashley Fisher, Lee Anne Long, Evan Millar, Elizabeth Murphy, Deborah Szymczyk, Maria Vadala, Wendy M. Frazier, & Donna R. Sterling (2008, November). *Problem-based learning: Astronomy and oceanography for elementary grades*. Virginia Association of Science Teachers, Hampton, VA.
- Wendy M. Frazier, Don Foss, & Andrew Jackson (2008, November). *Professional opportunities through VAST - for preservice teachers*. Virginia Association of Science Teachers, Hampton, VA.
- Donna R. Sterling (2008, September). *Science Test Scores Increase When New Teachers Receive Support*. Virginia Mathematics and Science Coalition, Richmond, VA.

### Elementary Science Education

"Think You Want to Be a Teacher" information sessions on our elementary programs offered in Fairfax will be held on August 25 and November 3. Registration for information sessions is available at <http://cehd.gmu.edu/admissions/infosessions/>. The deadline for admission to programs is Feb 1 each year, and the website for admissions information is <http://gse.gmu.edu/programs/elementaryed/admission/s/> or contact Carol Ardon ([sardon@gmu.edu](mailto:sardon@gmu.edu)).

### PhD and Advanced Masters Degrees in Science Education for Experienced Teachers

Thinking about going back to school to get an advanced masters or doctorate in science education, but you were not quite sure what you could potentially do with the degree? Mason offers two advanced masters degrees and a doctoral degree in science education. Graduates are prepared for careers as school or central office leaders, curriculum and instructional materials developers, state or national agency leaders, college or university faculty, college or university researchers, or professional organizations leaders. If interested in these programs in science education for experienced teachers, please read about these programs online (URLs are listed for these programs at the end of this newsletter) and contact Donna Sterling at [dsterlin@gmu.edu](mailto:dsterlin@gmu.edu) for more information. Admission to the masters programs is open each semester and the doctoral program every couple of years.

### Program Information on the Web Initial Teacher License

Mason's College of Education and Human Development offers a variety of degree programs involving science education. Here are links to the initial teacher licensure programs:

- **Initial License** with Masters in Elementary Education  
<http://gse.gmu.edu/programs/elementaryed/>
- **Initial License** or Masters in Secondary Education  
<http://gse.gmu.edu/programs/secondaryed/>

### Program Information on the Web For Experienced Teachers

Mason's College of Education and Human Development offers a variety of degree programs for experienced teachers to receive advance degrees in science education. Here are links to the advanced degree programs:

- **Masters** in Science Education Leadership (includes coursework toward administration and supervision license)  
<http://gse.gmu.edu/programs/science/>
- **Masters** in Advanced Studies in Teaching and Learning Science  
<http://gse.gmu.edu/programs/astl/>
- **Doctorate** in Science Education Leadership  
<http://gse.gmu.edu/programs/science/>

### Center for Restructuring Education in Science and Technology

The [\*Center for Restructuring Education in Science and Technology\*](#) (CREST) at [\*George Mason University\*](#), focuses on providing quality science, mathematics, and technology education from early childhood through adulthood.

Director: Donna R. Sterling  
Associate Director: Wendy M. Frazier

For information check online at:  
<http://cehd.gmu.edu/crest/>

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