Foundational Physics for Middle Level Science Teachers is a collaboration of George Mason University, Alexandria City, Arlington County, Fairfax County, and Manassas City Public Schools to prepare and train eighth grade physical science teachers, ninth or tenth grade Active Physics teachers, and middle/high school special education science teachers to use research-based teaching practices using "modeling" to teach physical science. The workshop will cover introductory mechanics, electricity and magnetism, and light and sound. Using course materials, participants will work through activities alternately in the roles of student or teacher as they practice techniques of guided inquiry and cooperative learning. Funds for this project are provided by a grant from the federal Improving Teacher Quality State Grants (Title II, Part A,) Professional Development Program administered by the State Council of Higher Education for Virginia.

Summer Dates: July 2 - July 20, 2007
Follow-up sessions: February 9 and April 5, 2008
Place: Robinson Secondary School, Fairfax, VA
Stipends: $750 stipend for successful completion of course, approximately $600 in equipment and materials, and lunch during the summer

The New Science Teachers' Support Network (NSTSN) is an award-winning program that provides new teachers who have degrees in science but no education background with support as they begin teaching. It is in its fourth and final year of data collection. Funded by a National Science Foundation (NSF) grant, the NSTSN is a collaborative research project involving George Mason University, Fairfax County Public Schools, and Prince William County Public Schools. Its main goal is to investigate effective support systems that help beginning teachers succeed at teaching and remain in the profession. Teachers assigned to the treatment group received on-site coaching support from retired science teachers and free science methods courses. Dr. Donna R. Sterling is the principal investigator, and Dr. Wendy Frazier is the program manager. For more information please check online at: http://gse.gmu.edu/centersoffices/crest/researchprograms/nstsn.htm

George Mason University is participating in the Virginia Earth Science Collaborative to support Virginia teachers in obtaining a teaching license in Earth Science. Nine colleges and universities, two non profit organizations, and 71 school divisions have formed a partnership to develop coursework designed to improve the quality of Earth Science instruction as well as meet licensure requirements for teaching. At George Mason University Dr. Donna R. Sterling (CREST) and Dr. Rick Diecchio (Environmental Science and Policy) are the investigators on this project. Dr. Wendy Frazier (CREST) serves as the evaluator. This past summer, Dr. Rick Diecchio, with the assistance of Marty Lindemann (PWCS), taught the Geology of Virginia, and Dr. Harold Geller, with the assistance of Lee Ann Hennig (FCPS), taught astronomy. The project is being led by the Mathematics and Science Center in Richmond, VA. For more information: http://VirginiaEarthScience.info
CREST offered two sessions of camp in summer 2006 for students entering grades 5-7. During our Weather Tamers session students acted as meteorologists, construction engineers, and policy makers while exploring the mysteries of our weather and the impact of weather on the decisions we make. During our Crime Busters session, students used the techniques of forensic scientists as they solved a special “Who Dunnit” mystery using biology, chemistry, and physics. Dr. Wendy Frazier was camp director and the staff were preservice master’s degree teachers in Mason’s PK-6 teacher licensure program. Dr. Sterling served as content advisor and resident scientist. Speakers included Mason faculty and doctoral students as well as speakers from Mason Police, Fairfax County Police, ABC 7 Weather (WJLA), Incorporated Research Institutions for Seismology (IRIS), U.S. Drug Enforcement Administration (DEA), U.S. Army, and Joint Military Intelligence College (JMIC).

Modeling Physics Instruction Produces Growth

Funded through the State Council of Higher Education for Virginia, high school physics teachers were taught how to implement Arizona State University research-based Modeling Physics curriculum. Data analysis revealed four areas of significant growth from the beginning to end of this course: (1) an increase in the teachers' content knowledge of physics, (2) an increase in the teachers’ students’ content knowledge of physics, (3) teachers felt they could better meet the needs of diverse learners, and (4) teachers were able to identify more strategies for reaching the needs of diverse learners. Melissa Booker and Greg Matthes were instructors. Dr. Donna R. Sterling was principal investigator.

Elementary Science Education

Seventeen inservice teachers are enrolled in Mason’s EDCI 634 Advanced Science Methods for Elementary Teaching this fall. Teachers enrolled in the course have completed their initial licensure in elementary education and are completing this course as a part of their requirements for the M.Ed. in Curriculum and Instruction. Teachers in the course are at various experience levels and teach in different school divisions, which makes for a diverse community of learners learning together how to best teach children science concepts and skills. Wendy Frazier is the course instructor with the assistance of Amos Simms-Smith (FCPS) and Dawn Renee Wilcox (SCS).

Doctors Students Teach Mason Science Methods Courses

Dawn Renee Wilcox and Amos Simms-Smith are assisting Dr. Wendy Frazier with EDCI 634: Advanced science methods for elementary teaching. The course focuses on inquiry and extensions of theoretical understanding of how children learn. In addition, students develop and incorporate a variety of skills to maximize the use of assessment and technology as well as awareness of gender/cultural issues via the nature of science.

Mollianne Logerwell is teaching EDCI 673 Advanced Methods of Teaching Science in Secondary School during Fall 2006. The two main projects in this course are conducting action research to investigate strategies for meeting the needs of diverse learners and learning effective ways to integrate technology into the classroom.

Teachers Assist in Mason Science Methods Courses

Many thanks to the following inservice teachers from Fairfax County Public Schools for serving as technology specialists in EDCI 673 during the fall 2006 semester: Debbie Meinholdt (biology) Edison HS, Jim Jarvis (Earth science) Thomas Jefferson HS, Tony Rugari (physics) Edison HS, and Donna West (chemistry) Woodson HS. Their expertise helps to make Mason’s advanced science methods course for preservice teachers based on authentic practice.

Student and Faculty Presentations and Publications


Alumni Accolades

• This summer, Erin Peters was an instructor for the Teacher Content Academy at James Madison University for the Physical Sciences. She is currently working at NASA headquarters as their Albert Einstein Distinguished Educator Fellow in the Exploration Systems Mission Directorate. She is also the NASA representative for Project Lead the Way, which works with the development of K-12 National Engineering Standards and a proposal reviewer for NASA Explorer Schools Microgravity K-12 Projects.
• Dawn Renee Wilcox is the new science coordinator for Spotsylvania County Schools.

Awards

• Alex Workman received the fall 2006 Science Education Leadership Master’s Degree Fellowship Award for $500.
• Karen Dunn received the Educational Psychology award for the Learning, Cognition, and Motivation program at the College of Education and Human Development Awards Dinner in May.
• Erin Peters was selected to be an Einstein Fellow for academic year 2006-2007. She will work in the NASA Exploration Systems Mission Directorate.
• Erin Peters received one of the Virginia Association of Teacher Educators (ATE-VA) Teacher Researcher Awards on April 6, 2006.

Student Assistant

Mansi Bhagdeo, master’s student in Mason’s secondary science teacher licensure program, is currently working with CREST staff on science camp research initiatives.

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. For information check online at: http://gse.gmu.edu/centersoffices/crest/

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