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Real STEM: Scientific Research for Rural Georgia Students

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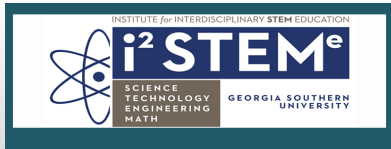


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Real STEM

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Real STEM Grant

A Race to the Top Grant funded through the Governor's Office of Student Achievement (GOSA) awarded to Georgia Southern University.

Through partnerships, develop and implement high school courses that focus on interdisciplinary STEM scientific research, leading to a three course sequence that constitutes an academic pathway and supports a STEM school designation.

This grant proposes that when teachers are trained in the tenets of the grant, they will use these strategies in designing course work for students that will result in increased STEM achievement, increased interest in STEM and STEM careers, and STEM literate citizens better prepared to make informed decisions about grand challenge issues which will impact their lives.

Tenets of the Grant

I. Place-based Education

- Learning takes students "out" of the classroom and into the community and natural environment
- Students learn how local systems relate to regional and/or global systems
- Students collaborate with research scientists, local citizens, organizations, agencies, businesses, and/or government

II. Problem-based Learning

- Engages students as participants immersed in real-world, ill structured, problematic situations
- Organizes curriculum around a holistic problem, enabling student learning in relevant and connected ways
- Coaches student thinking and guides student inquiry, facilitating learning toward deeper levels of understanding

III. Teaching for Understanding (Ubd)

- Identify Desired Results
- Determine Acceptable Evidence
- Planning Learning Experiences and Instruction



IV. Modes of Reasoning

- Engages student in multiple approaches of investigation (i.e. model-based reasoning, computational reasoning, Engineering Design, and Quantitative Reasoning)
- Students create, test, and refine models of real-world situations
- Recognize and accurately interpret data

V. Interdisciplinary STEM (interdisciplinary vs. multidisciplinary)

- Emphasizes connections between traditionally discrete disciplines
- Works with a range of sources of information and perspectives
- Integrates multiple disciplines to solve problems

Reflections

"In being exposed to all of the hands-on research and our experiences with the scientists, we gained a lot of knowledge that can be brought into the classroom."
-Teacher

"...we were able to have experiences that we can take back to the classroom to our students so that they can use the same processes that the people that work in the field use every day. This gives our students experience in using science, technology, engineering, and math..."
-Teacher

"We learn things that aren't normally taught at school. We take real world problems and try to solve them through STEM. That is something that we aren't able to do in other classes."
-Student

"It was fun researching and building our very own project. I never thought I would take interest in that."
-Student

Collaborative Partnerships

Team 1 – Research Institutes	Team 2 – GSU Faculty
Georgia Southern University	Engineering – Dr. Mitra
Gray's Reef – NOAA	Biology – Dr. Legee & Dr. Gleason & Dr. Colon-Gaud
Southeastern Natural Sciences Academy	Chemistry – Dr. LoBue
Sapelo Island National Estuarine Research Reserve	Geology – Dr. Smith
Georgia Adopt A Stream	Mathematics – Dr. Lanier
Skidaway Institute of Oceanography	Physics – Dr. Gatch & Dr. Balaraman
Camden County Cooperative Extension	Education – Dr. Mayes

Team 3 – Partner Schools

Burke County High School 	A public co-ed high school located in Waynesboro, Georgia. Burke County High School serves 1,250 students in grades 9 – 12. 1057 Burke Veterans Parkway Waynesboro, Georgia 30630 Phone: (706) 554-6691
Camden County High School 	The only public high school for Camden County, Georgia. It is located in Kingsland, Georgia. Camden County High School serves 2,762 students in grades 9-12. 6300 Laurel Island Pkwy Kingsland, GA 31548 Phone: (912) 729-7318
Statesboro High School 	A public high school located in the city of Statesboro, Georgia. Statesboro High School serves 1,572 students in grades 9-12. 10 Lester Rd Statesboro, GA 30458 Phone: (912) 212-8860
Ware County High School 	The only public high school in Ware County, Georgia. It is located in Waycross, Georgia. Ware County High School serves 1,750 students in grades 9-12. 700 Victory Drive Waycross, Georgia, 31503 Phone: (912) 287-2351

* Each partner school utilized an Interdisciplinary Professional Learning Community

Participant Reflections



GSU Real STEM Day



On Wednesday, November 20th, 2013 approximately 65 high school grant participants arrived on the campus of Georgia Southern University to share with each other in a research roundtable discussion and to participate in informative sessions in each of the GSU STEM departments. Students were exposed to the many STEM career opportunities available to them through a college experience. The students were challenged to think about life after high school.

Grant Timeline

Spring 2013 – PLC work and implement a 1-2 week research module



Summer 2013 – PLC members participate in field experiences and an education symposium



School Year 2013/14 – Cohort 1: PLC work and implement a high school scientific research course
Cohort 2: PLC work and implement a 1-2 week research module



Summer 2014 – Continue PLC field experiences and pedagogy exploration



School Year 2014/15 – Cohort 1: Continue PLC work and course implementation
Cohort 2: Continue PLC work, module and/or course implementation
Cohort 3: Begin PLC work, 1-2 week research module and/or course implementation



Institute for Interdisciplinary STEM

The Institute for Interdisciplinary STEM Education (I2STEME) will establish collaborative interdisciplinary programs committed to excellence in K-20 STEM teaching and learning, with a focus on rural, diverse, low SES, and under-represented populations. The Institute will address problems indigenous to the rural environments of the region, including issues of cultural diversity and cultural relevance within our diverse population, matters of equitable access to STEM for low SES students, and concerns about the relevance of STEM for rural students. Long-term goals of the Institute are to establish partnerships across Georgia, the southeastern region of the United States, nationally, and even internationally to address issues of STEM education in rural areas.