UD GK-12 Website Development

Jeff Spraggins: www.udel.edu/GK-12
Goals

- Enhance Content
- Develop Written Communication Skills
- Compliance with UD Branding
- Upgrade Appearance
- Develop Web-based Communication Skills
• Goals
  • Enhance Content
  • Student/Advisor Profiles
  • Materials
• Develop Written Communication Skills
• Compliance with UD Branding
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Delaware GK-12
A Partnership between the University of Delaware and
the New Castle County Vocational Technical School District

2008 Press Coverage:

University of Delaware:
6/11/2008, UDaily: "Symposium highlights NSF GK-12 UD fellows’ work" (article.pdf, photos: 1, 2)

2007 Press Coverage:

University of Delaware:
5/24/2007, UDaily: "NSF GK-12 conference showcases UD fellows’ work" (article.pdf, photos: 1, 2, 3)
2/20/2007, UDaily: "NSF-funded program boosts teachers' skills" (article.pdf, photo)
NSF, March 2007: Delaware GK-12 receives honorable mention for Media Award (photo)

2006 Press Coverage:

4/24/2006 Press Event at Howard High School of Technology:
PowerPoint presentation (3.9 Mb) [Updated Oct 2006 to include all 2006 Teachers and Fellows]

University of Delaware:
4/25/2006, UDaily: "UD, NCC vo-tech district announce NSF project" (article.pdf, cover.pdf, photo)
8/17/2006, UDaily: "NSF workshops target science education, teaching methods" (article.pdf, photo)

The News Journal/delawareonline.com:
4/24/2006 print "School to offer science for real world" (article.pdf)
4/24/2006 p.m. newscast (local copy) [play 0:51 to 1:38]

WDEL 1150AM News Talk Radio:
4/24/2006 newscast (local copy)

Conference Presentations:

October 2006, Annual Meeting of Geological Society of America, Philadelphia
poster "Delaware GK-12: Improvement of Science Education in Vocational Technical High Schools through Collaborative Learning and Co-Teaching" (abstract, poster)

March 2007, Seventh Annual NSF GK-12 Project Meeting, Washington, DC
poster "Delaware GK-12: Improvement of Science Education in Vocational Technical High Schools through Collaborative Learning and Co-Teaching" (abstract, poster.pdf, poster.pdf) [71Mb]
Goals  Home  Fellows  Teachers  Advisors  Leaders  Materials  GK-12  NCCVT  NSF

Delaware GK-12

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• **Goals**

- Enhance Content
- Develop Written Communication Skills
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- Develop Web-based Communication Skills

The University of Delaware partnership with the New Castle County Vocational Technical School District has received funding from the National Science Foundation to institute a Graduate Teaching Fellows Program in K-12 Education (GK-12) [website]. In each of the three years of this project, nine full-time PhD graduate students in the sciences, who have completed all or most of their coursework, are selected to serve as fellows.

Fellows are paired with high school teachers at one of the 12 participating schools where they are expected to develop and deliver one or more modules. The principal investigators (PIs) of this project, form a mentoring community that has the opportunity to examine and reflect on current issues in education while specifically addressing critical needs in science and mathematics education.

By participating in summer immersion experiences conducted by the project leaders, the fellows are introduced to a number of innovative teaching strategies including problem-based learning (PBL). During the academic year, fellows engage in co-teaching with their teacher partners in this "teaching by teaching" model. The goal is to expose teachers to the complexities and nuances of teaching science in secondary schools. In high schools, the project teachers are expected to work with curriculum directors to ensure the project's goals are met.

Fellows receive a twelve-month stipend of $30,000 and are expected to spend twenty hours per week on the project. The time commitment includes ten days during the summer devoted to workshop and development activities and a minimum of ten hours per week during the academic year that fellows spend in their teacher partner's classroom. Fellows must be citizens, nationals, or permanent residents of the United States. Fellows are selected based upon a review of written applications and an interview process by the project leaders. It is essential that fellows have the support and cooperation of their research advisors to participate.
Delaware GK-12

A partnership between the University of Delaware and the New Castle County Vocational Technical School District

The University of Delaware, in partnership with the New Castle County Vocational Technical School District, has received funding from the National Science Foundation to institute a Graduate Teaching Fellows Program in K-12 Education (GK-12). In each of the three years of this project, nine full-time UD graduate students in the sciences, who have completed all or most of their coursework, are selected to serve as fellows.

Fellows are paired with high school science teachers from NCCoVoTech. These pairs, along with the principal investigators (PIs) of this project, form a learning community that has the opportunity to examine and to reflect on current issues in education while specifically addressing critical needs in science education in vocational technical high schools.

By participating in summer workshops and follow-up meetings facilitated by the project leaders, the fellows are introduced to a number of innovative teaching strategies including problem-based learning (PBL). During the academic year, fellows engage in coteaching with their teacher partner. In this "teaching at the elbow of another", fellows gain a better understanding of and appreciation for the complexities and nuances of teaching science in vocational technical high schools. Fellow/teacher pairs develop PBL activities, aligned with curricular needs, to allow their students to experience the benefits of guided-inquiry learning environments.

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The University of Delaware, in partnership with the National Science Foundation to institute a GK-12 program, has received funding from the National Science Foundation to institute a GK-12 Education Program in K-12 Education (GK-12) [website]. In each of the three science, who have completed all or most of their coursework, are Fellows Program in K-12 Education (GK-12) [website]. In each of the three sciences, who have completed all or most of their coursework, are paired with high school science teachers in their area of expertise. Fellows, along with the principal investigators (PIs) of this project, form a learning community that has the goal of addressing critical needs in science education.

By participating in summer workshops and fellowships, innovative teaching strategies including problem-based learning (PBL), engaged in coteaching with their teacher partners. In this "teaching at the elbow of another", fellows gain a better understanding of and appreciation for the complexities and nuances of teaching science in vocational technical high schools. Fellows/teacher pairs develop PBL activities, aligned with curricular needs, to allow their students to experience the benefits of guided-inquiry learning environments.

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In my time at Saint George's, I was a part of our Academic Honors Program and served as a member of the academic council. I participated in all aspects of the school's life, including extracurricular activities, student government, and various leadership roles. My experiences have taught me the importance of time management, teamwork, and personal development. I have grown from a shy and reserved individual to a confident and assertive person.

My current focus is on developing a research project that addresses a significant problem in the field of education. I am interested in investigating the effectiveness of innovative teaching methods and how they can be implemented in the classroom. My goal is to design a research project that will enhance student engagement and promote critical thinking.

I am currently exploring the potential benefits of using technology in education, particularly in the context of STEM subjects. I aim to create a comprehensive curriculum that integrates technology with traditional teaching methods, thereby improving student outcomes.

In the future, I plan to pursue a career in educational leadership, with a focus on policy development and educational research. I hope to contribute to the improvement of education systems and to create a more equitable learning environment for all students.
In The Classroom: At Saint George’s Vocational High School I used the little work I could get to supply the overhead projector and interactive whiteboard. I taught students how to use visual aids in presentations. Unfortunately, due to budget cuts, the school couldn’t afford the technology. Additionally, my students tended to be very disengaged and often got frustrated when they didn’t understand the material. This made it difficult to engage them and keep them interested in the subject. However, I found that by creating interactive activities and using real-world examples, I was able to capture their attention and help them better understand the material.

Developed Class Material
Research: PPT, PDF
Teaching: PPT, PDF
Contact: shaimik@sanmail.com

Goals
- Home
- Fellows
- Teachers
- Advisors
- Leaders
- Materials
- Big Picture
In the Department of Chemistry, we understand that the knowledge we pursue is interconnected. By exploring the fundamental principles of chemistry, we seek to uncover the underlying mechanisms that govern the behavior of matter. This knowledge is not only essential for advancing scientific understanding but also has practical applications in fields ranging from medicine to environmental science.

**Goals**
- Understand the fundamental principles of chemistry.
- Explore the interconnectedness of scientific disciplines.
- Apply chemical knowledge to solve real-world problems.

**Home**
- Access the main page of the Delaware GK-12 program.

**Fellows**
- Information about Fellows and their contributions to the program.

**Teachers**
- Resources and support for educators.

**Advisors**
- Information on advising roles and responsibilities.

**Leaders**
- Leadership structure and contacts.

**Materials**
- Access to learning materials and resources.

**Big Picture**
- Insights into the broader impact of the program.

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In the Chemistry Department, we engage with cutting-edge research and developmental projects to advance our understanding of chemical processes. Our curriculum is designed to foster critical thinking and problem-solving skills, preparing students for success in any scientific field they choose to pursue.

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By working withcked Chemistry Department Fellows, teachers, and advisors, our students gain valuable mentorship and professional development opportunities. This collaborative environment is crucial for nurturing a strong foundation in chemistry and for preparing them to contribute meaningfully to the field.

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The Delaware GK-12 program is dedicated to professional development for teachers and faculty in collaboration with chemistry professionals. Through this partnership, we aim to enhance the teaching and learning of chemistry, making it more accessible and engaging for students.
Research: My research focuses on the use of FT-ICR mass spectrometry for the analysis of environmentally significant samples. A Fourier Transform Ion Cyclotron Resonance Mass Spectrometer (FT-ICR Mass Spec) is an instrument that measures the masses of individual molecules that have been electrically charged to form ions. Although measuring the mass of something is not all that impressive, the ability of this instrument to measure individual ions with extreme accuracy and resolution merits such an intimidating name. In addition, the design of the instrument allows for it to be used as a gas phase beaker where reactions can be observed between ions and molecules in real time.

One example of how we use this powerful technique is our study of the environmentally important reactions between metal clusters and hydrogen sulfide. By monitoring these reactions within the mass spectrometer we have been able to understand more completely the reaction pathways and rates of reaction for cadmium clusters. Currently we are working on systems with iron and zinc metals. Reactions between metal clusters and hydrogen sulfide are important for understanding both the chemistry taking place near hydrothermal vents (geysers on our ocean floors) and the fate of metal pollutants in our natural waterways.

In the classroom: Although I enjoy research, teaching is my true passion. I have a couple fundamental beliefs that drive my teaching philosophy. I believe that (1) any student, if motivated, can learn (and enjoy) science and (2) there should be no separation between what is taught in the classroom and the research that we, as scientists, focus so much of our time and effort working on.

Working with Terry Blanch (St. Georges 2000-2002) and Kevin Madigan (Delco),...
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Delaware GK-12

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Integrated Science
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timbrewer@sgtech.de.us

Lisa Currie
Physics/Science
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Jessica Jackson
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Michael Ketel
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Florence Mallowsk
Biotechnology
St. Georges Technical High School
fmladowski@sgtech.de.us

Amy Quillen
Science Specialist
NCCVT

Goals Home Fellows Teachers Advisors Leaders Materials Big Picture
### Delaware GK-12

#### 2008-2009 Advisor Recommendation Form: [Word], [PDF]

**2008 GK-12 Participants**

<table>
<thead>
<tr>
<th>Advisors</th>
<th>Department</th>
<th>Email</th>
<th>Fellows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Sikes</td>
<td>Biological Sciences</td>
<td><a href="mailto:RASIKE@udel.edu">RASIKE@udel.edu</a></td>
<td>Adam Aguiar</td>
</tr>
<tr>
<td>Jamie Holder</td>
<td>Physics &amp; Astronomy</td>
<td><a href="mailto:iholder@physics.udel.edu">iholder@physics.udel.edu</a></td>
<td>Dana Boltuch</td>
</tr>
<tr>
<td>Randy Duncan</td>
<td>Biological Sciences</td>
<td><a href="mailto:RLUDANCAN@udel.edu">RLUDANCAN@udel.edu</a></td>
<td>Patricia Jones</td>
</tr>
<tr>
<td>Doug Tallamy</td>
<td>Entomology &amp; Wildlife Ecology</td>
<td><a href="mailto:DTALLAMY@udel.edu">DTALLAMY@udel.edu</a></td>
<td>Christy Beal</td>
</tr>
<tr>
<td>Tom Beebe</td>
<td>Chemistry &amp; Biochemistry</td>
<td><a href="mailto:BEEBE@udel.edu">BEEBE@udel.edu</a></td>
<td>Mary Boggs</td>
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<tr>
<td></td>
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<td></td>
<td>Kristy Longsdorf</td>
</tr>
<tr>
<td>Doug Ridge</td>
<td>Chemistry &amp; Biochemistry</td>
<td><a href="mailto:DOUGR@udel.edu">DOUGR@udel.edu</a></td>
<td>Jeffrey Spraggins</td>
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</tbody>
</table>
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advisors

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GK-12

NCCVT

NSF

Delaware GK-

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George H. Watson holds a Ph.D. in Physics and is the Unidel Professor of Physics at the University of Delaware; he is currently the Deputy Dean of the College of Arts and Sciences at UD. He serves as the principal investigator of the National Science Foundation GK-12 Project "Improvement of Science Education in Vocational Technical High Schools through Collaborative Learning and Coteaching."

George is director and founding member of the Institute for Transforming Undergraduate Education, created by UD to promote reform of undergraduate education through faculty development and course design. He has been a member of several organizing committees for international problem-based learning conferences, including PBL2002, hosted by the University of Delaware; PBL2006; PBL2008; and PBL2010. He has been supported by a NSF DUE grant for development of PBL curricula for introductory physics and a ALO/USAID grant for development of science education reform in Peru through PBL.

George’s physics research has been in experimental condensed matter physics and laser spectroscopy, funded by NSF in the areas of optically-disordered random media, photon localization, and photonic band structure measurements, particularly in colloidal crystals.

See George Watson’s Home Page for more information.
Contact: ghw@udel.edu
The University of Delaware, in partnership with the New Castle County Vocational Technical School District, has received funding from the National Science Foundation to institute a Graduate Teaching Fellows Program in K-12 Education (GK-12) [website]. In each of the three years of this project, nine full-time UD graduate students in the sciences, who have completed all or most of their coursework, are selected to serve as fellows.

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Teacher Pair: Brian Heeney
Developed Materials
Research Presentation: PPT, PDF
Activities
Mutation and Cancer
Mutation and Cancer Presentation: PPT, PDF
Baciera-Tobacco Mutant Lab: DOC, PDF
Baciera-UV Mutant Lab: DOC, PDF
Lorenzo’s Oil
Lorenzo’s Oil Presentation: PPT, PDF
Lorenzo’s Oil Guiding Questions: PPT, PDF
Paperclip/Fatty Acid Modeling Activity: DOC, PDF
Subject: Biological Sciences
Teaching Presentation: PPT, PDF
Natural Selection at Work
Bacterial Resistance Presentation: PPT, PDF
Serratia Ampicillin Resistance Lab: DOC, PDF
TB Simulation Activity: DOC, PDF
Owl Pellet for Integrated Sciences
Owl Pellet Presentation: PPT, PDF
Barn Owl Worksheet: DOC, PDF
Erin Foster
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ecc@udel.edu
The Big Picture

- New GK-12 Website
  - Enhanced Web-presence for UD GK-12
  - Educational Resource
  - Written Communication Skills
  - Web-based Communication Skills