

**Georgia Tech – Gwinnett County Schools
Math Science Partnership
GT Project # - 3906889**

- Gwinnett County Schools and Georgia Tech were awarded a Department of Education Middle School Partnership (MSP) grant to provide staff development for middle grades teachers. In the fall of 2005 6th grade teachers will be teaching Earth Science instead of Physical Science as the State transitions Physical Science to 8th grade and Earth Science to 6th grade. Sixth grade and seventh grade teachers have begun implementing the new Georgia Performance Standards (GPS) during the fall of 2006 in earth and life science, respectively. For two years Earth Science will be taught at 6th and 8th grade during the transition. JASON Academy online courses were taught by Georgia Tech graduate students in the areas of life and earth science during the 2005 – 2006 school year. Two sections of Science and Young Children were taught to elementary school teachers in grades K-5 to provide content knowledge and best practices for elementary teachers of science. Three – 5 week online courses were offered to groups of approximately 20 teachers in the areas of life and earth science. These classes of teachers took the series of courses together in order to build a professional learning community. Classes participated in class discussion groups together and met with their instructors in face to face sessions prior to and following each course. JASON Project <http://www.jasonacademy.org/home.htm> provided the curriculum resources which include inquiry-rich content, online activities, quizzes, etc. Georgia Tech – EAS graduate students with the face to face sessions with teachers.
- **Donna Barrett** of Georgia Tech – CEISMC worked as Pedagogy Expert and Evaluation Consultant coordinating the following: selection and training of Georgia Tech course instructors for the 4 online courses; planning workshops for instructors on pedagogy and course expectations; developing course pre and post tests; modifying the course requirement to include the development of a weekly activity based upon new content learned; once per course meeting with teachers at individual schools to discuss course expectations, new content and development of classroom activities; the development of evaluation instruments including the Concerns Based Adoption Model to measure the effectiveness of course and course expectations; assistance in planning face to face meeting agendas; assistance with the coordination of teacher practicum and student camps; coordinating the field trip at Georgia Tech and other summer practicum activities for teachers.
- Tech EAS graduate students, **Anne Case, Venus Dookwah, Carissa Howard, Ping Jing, Arsineh Hecobian and Violeta Toma** were JASON Instructors to classes of approximately 20 middle grades teachers. The life science series taught by Hecobian, Toma and Howard included: Cell Biology, Endangered Ecosystems: Rainforest and Aquatic Ecology, respectively. The earth science series was taught by Howard, Case and Dookwah included: Earth in the Solar System, Structure of the Earth and Water Quality, respectively. Jing and Case taught multiple sections of Science and Young Children.
- The EAS graduate students (instructors) attended numerous training sessions at CEISMC to find out information about the structure of the courses, pedagogical strategies, Gwinnett County Public School expectations as well as using the eCollege platform.
- The primary responsibilities of instructors included: directing conversation in discussion forums at least once a day; posing questions to students and responding to questions on content and pedagogy. Instructors also graded the level of discussion and assisted teachers with the development of weekly inquiry based classroom activities developed.
- Instructors also planned and attended face to face meetings with teachers in Gwinnett prior to and following each course. These meetings consisted of debriefing of the content covered in the courses as well as leading the teachers through hands-on activities.
- The teachers participating in the school year online courses were involved in two weeks learning sessions during the summer. During the week of May 30 – June 1, teachers were involved in a Teacher

Practicum that included the sessions: Effective Science Pedagogical Strategies, Stream Monitoring and tour of the F. Wayne Hill Water Resources Center, and Vernier probe training session conducted by JASON Academy.

- During the week of June 12 – 16, teachers were involved in a series of field trips related to their courses. Meg Grathan of GT EAS took teachers on a fossil dig to Trenton, Georgia. They attended a field trip on Geology applications at the new Gwinnett Environmental and Heritage Center. They visited Georgia Tech and participated in faculty lectures and EAS lab tours. They heard presentations from **Michael Chang, Kim Cobb, Andrew Stack, Thanos Nenes** and several others in the area of global climate change and the impact of humans on the environment. They visited the state botanical gardens in Athens and heard a presentation on “Gifts from Plants - Medicinal Plants in the Classroom.”
- During the summer of 2006, 2 Gwinnett County Earth Science teachers worked in various labs at Georgia Tech.
 - **Susan Davis**, life science teacher at Trickum Middle School worked in the bioinformatics lab (MIBLab) at Georgia Tech under the direction of Dr. May Wang. The goal of the lab is to develop or improve software tools that will help clinicians detect cancer in earlier stages of development and with more confidence. The MIBLab held a journal club twice a week. Davis would like to emulate this process for her students by selecting articles for them to read, write a review and then present it to the class. She is hoping to increase her students' reading comprehension and writing skills while learning the content.
 - **Peter Cutter** life science teacher at Lilburn Middle School worked in the bioinformatics lab (MIBLab) at Georgia Tech under the direction of Dr. May Wang. According to Cutter, the purpose was to become acquainted with the research and fields of study being developed to better understand the current trends, standards, and careers in science today, and to translate that experience into a strategy, lesson plan, teaching style, and or activity into his classroom in order to encourage interest and achievement in math and sciences in early education with the goal of increased enrollment in these fields and career paths. During the project he approached this goal by reading current and breakthrough Journal articles in the fields of Genomics and Bioinformatics, interacting with current researchers in the fields, and exploring software and web-based tools in order to increase my content knowledge and familiarity with common terminology and key concepts. *(Cutter participated in the life science course series)*

*Based on their collaborations from the previous initiative with GCPS (but not funding by this project), **Kari Salomon**, 8th grade Earth Science teacher at Hull Middle School worked with **Tim Liewen in Aerospace Engineering**. She has been observing and participating in combustion lab investigations involving flame dynamics, combustion of synthetic fuels, blow out detection in premixed flames, and other experiments. Under the mentorship of Dr. Tim Liewen, she is developing science lesson plans that incorporate her "real lab" experiences to her classroom teaching. There are many commercial applications to these types of studies. One application of Georgia Tech's work in the combustion lab range from developing flexible-fuel gas turbine combustors that would be used in power generating plants to co-produce electricity and heat with a variety of fuels while minimizing harmful emissions. Other applications involve combustion in turbine (jet-type) engines sponsored by entities such as NASA Ames, GE Aircraft Engines, U.S. Department of Energy, and the National Science foundation.*