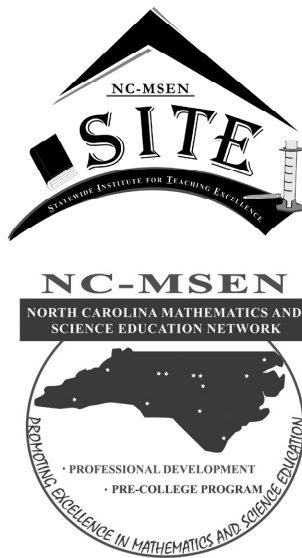


Mathematics & Science Education Center

2008 DATES TO REMEMBER

- June 9-13:** NC-MSEN SITE: 3-5 Science
- June 16-20:** NC-MSEN SITE: Biology; NC-MSEN SITE: 6-8 Science
NC-MSEN SITE: Advanced Functions and Modeling (MELT)
Integrating Middle School Math (MELT)
- June 23-27:** Exploring Math with TI-Nspire (MELT); Teaching Integrated Math I and II (MELT)
- July 7-8:** Middle Math Summer Institute
- July 7-11:** Teaching Algebra (MELT); Purposeful Pedagogy and Analyzing Teaching (MELT)
- July 14-18:** NC-MSEN SITE: Geometry (MELT); Teaching Discrete Math (MELT)
- October 30-31:** NCCTM State Mathematics Conference in Greensboro
- October 30-November 1:** NSTA Regional Conference in Charlotte
- October 1, 2008 – January 31, 2009:** Summer Ventures recruitment period



- Visit our website at www.msec.appstate.edu -

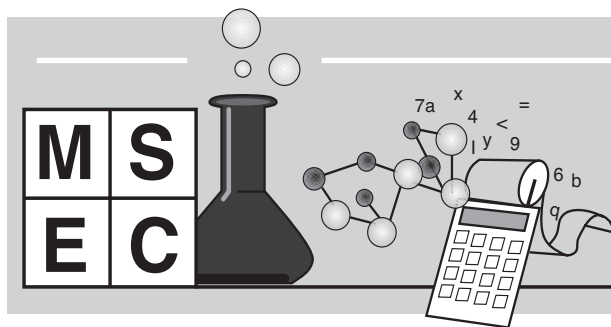
Math & Science Education Center: Phone: 828/262-3185, Fax: 828/265-8677, Email: johnsnpe@appstate.edu
MSEC Staff: Phillip Johnson, Director; Betty Long, Assistant Director;
Lori Tyler, Summer Ventures in Science and Mathematics Director; Vickey Isaacs, Administrative Assistant
Editor: Phillip Johnson; Assistant Editors: Vickey Isaacs, Betty Long and Lori Tyler

Appalachian
STATE UNIVERSITY

Mathematics and Science Education Center
Walker Hall, Room 222
P.O. Box 32091
Boone, North Carolina 28608-2091

U.S. POSTAGE
PERMIT NO. 36
PAID
NON-PROFIT ORG.
BOONE, NC

Appalachian State University is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees on the basis of race, color, national origin, religion, gender, age, disability or sexual orientation. Appalachian also actively promotes diversity among students and employees. 1,000 copies of this public document were printed at a cost of \$142.00, or 14.2¢ cents per copy. ♻️



SPRING 2008

Appalachian State University MATHEMATICS & SCIENCE EDUCATION CENTER

SUMMER 2008 PROFESSIONAL DEVELOPMENT OPPORTUNITIES

NC-MSEN SITE Program Grows

The North Carolina Mathematics and Science Education Network Statewide Institute for Teaching Excellence (NC-MSEN SITE) Program has expanded substantially since its start in the summer of 2006. Starting this summer, SITE will add K-2 Science so that now all of K-8 will have science institutes in the program. Not every SITE program is offered at every center, but each center offers several of the programs. The ASU center will offer SITE: 3-5 Science, SITE: 6-8 Science, SITE: Biology, SITE: Advanced Functions and Modeling, and SITE: Geometry. The SITE math courses are offered in cooperation with Appalachian's Mathematics Education Leadership Training (MELT) Program. All programs are on the ASU campus.

SITE: 3-5 Science is a nine-day institute (five days in the summer and four days in the 2008-2009 school year) that will focus on the four major science themes (**Rock Cycle, Ecology, Energy/Forces, Weather and Climate**) that cut across the *North Carolina Standard Course of Study* for Science, Grades 3-5. **Dates:** June 9-13 and four days to be determined; **Location:** Room 173, Rankin Science West; **License Renewal Credits:** 6.0 (with an implementation project); **Fee:** \$540 per teacher (and substitute teacher for two days); **Instructors:** Judy Sink and Lou Moore.

SITE: 6-8 Science is a nine-day institute (five days in the summer and four days in the 2008-2009 school year) that focuses on the major themes that cut across the *North Carolina Standard Course of Study* for Science, Grades 6-8. The institute is designed to deepen participants' science content knowledge and to strengthen their ability to teach science through inquiry. An additional emphasis is placed on integration of literacy, mathematics, and technology into the science curriculum and on the use of authentic assessments. Institute topics are **Life Systems** (human body, microbiology, pandemics) and **Earth Systems** (hydrosphere, lithosphere, and population dynamics). **Dates:** June 16-20 and four days to be determined; **Location:** Room 173, Rankin Science West; **License Renewal Credits:** 6.0 (with an implementation project); **Fee:** \$540 per teacher (and substitute teacher needed for two days); **Instructors:** Jeff Goodman and Leslie Bradbury.

SITE: Biology will help teachers more effectively implement the *North Carolina Standard Course of Study* for high school biology. During the 5-day summer institute, content material and pedagogical strategies will focus on respiration, photosynthesis, energy transfer in ecosystems, gene regulation, evolution, adaptation and unity and diversity of life. Content misconceptions, concept mapping and reading strategies will also be covered. A session at the North Carolina Science Teachers' Association fall institute will be offered to institute participants for resource sharing and assessment. **Dates:** June 16-20; **Location:** Room 177, Rankin Science West; **License Renewal Credits:** 3; **Fee:** \$300 per teacher; **Instructors:** Max Dass and Amy Bradley.



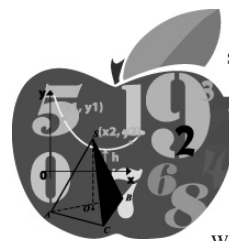
MELT SUMMER PROGRAMS

SITE: Advanced Functions and Modeling (AFM) and **SITE: Geometry** are offered through Appalachian's Mathematics Education Leadership Training (MELT) Program. The **AFM** course will focus on concepts such as data analysis, mathematical models, and the process of using functions to model real-world phenomena. Interactive, hands-on sessions will provide participants the opportunity to explore new ideas and practice with calculator technology, including the new TI-Nspire and a Smart Board, and lab activities. In addition, pedagogy and assessment will be discussed. This institute is a special opportunity to gather materials and ideas to share among colleagues who may teach AFM. The **Geometry** course will cover content material and pedagogical strategies for the standard high school geometry course as it is being taught in North Carolina. Topics treated will be Analytic Geometry of the Plane (specifically centered on linear objects, such as midpoint, centroid, circumcenter, etc.), Transformation Geometry (introduction to matrices and how they can be used to carry information about the transformation and how they differ), Polygons (reinforcing the material that is covered in the *North Carolina Standard Course of Study*), Circles (using axiomatic, transformational and analytic geometry to study circles and their properties), and Probability (review of probability and how geometric probability works; review of ratio and proportion). Following is the complete schedule of this summer's MELT offerings:

- June 16-20: Advanced Functions and Modeling (SITE); Integrating Middle School Math
- June 23-27: Exploring Math with TI-Nspire; Teaching Integrated Math I & II
- July 7-11: Teaching Algebra; Purposeful Pedagogy & Analyzing Teaching (open only to graduate students who are currently teachers)
- July 14-18: Teaching Discrete Math; Geometry (SITE)

These week-long MELT Institutes are open to all high school mathematics teachers and two-year college mathematics faculty and to middle school mathematics teachers with a strong background in mathematics. The fee per course is \$330. Each course may be taken for 3 license renewal credits or, for an additional fee, 2 graduate credits. For more information on the MELT program, visit www.melt.appstate.edu or contact Ms. Diana Ward (828/262-2360 or wardrd@appstate.edu). Dr. Doug Jones (jonesd@appstate.edu), distinguished professor of mathematics education, directs the MELT program.

MIDDLE MATH SUMMER INSTITUTE



The **Middle Math Summer Institute** is designed to support middle school mathematics teachers in meeting the grades 6, 7 and 8 *NC Standard Course of Study* competencies in their classrooms. The two-day Institute provides grade-level specific instruction focused on content knowledge, effective teaching strategies, and assessment methods that align with student academic performance standards in North Carolina. Separate sessions are provided for each of the three grade levels. The instructors are practicing middle school teachers who were participants and then Lead Teachers in the North Carolina Middle Mathematics Project. Most of the instructors are Nationally Board Certified Teachers in Early/Adolescent Mathematics and hold a Master's Degree in Education with a concentration in mathematics. The Institute will be held at the Broyhill Inn and Conference Center on the ASU campus July 7-8. **License Renewal Credits:** 1.2; **Fee:** \$130 per teacher. (For an additional fee and extra work, 1 hour of graduate credit is available.)

GREEN AND MICRO-SCALE CHEMISTRY WORKSHOP

The Green and Micro-Scale Chemistry (G&MSC) workshop is a joint effort of several people from the North Carolina Department of Environment and Natural Resources and Waste Production Partners with a grant from the Environmental Protection Agency. Covered will be how G&MSC fit into the DPI-prescribed curriculum and how they can be incorporated into high school chemistry courses. There will be discussion of numerous applications of G&MSC along with their pros and cons. Demonstrations will illustrate the principles and techniques involved, ways of starting and incorporating G&MSC into existing programs, and illustrate equipment needed for Micro-Scale Chemistry. References and handouts will assist those interested in learning more about these subjects. Additional presentations include laboratory safety, student protection, interpretation of Material Safety Data Sheet, chemical management, inventory techniques, and hazardous waste requirements and disposal. The workshop is open to middle school as well as high school teachers. **Date:** July 31; **Location:** Room 105, Walker Hall, ASU; **License Renewal Credit:** 0.5; **Fee:** None; **Stipend:** \$75.

Come and learn how to teach renewable energy and energy efficiency to your students!

Two K-12 teacher training workshops on renewable energy and energy efficiency will be held this summer. The first is on July 22 and 23 at the Appalachian State University Department of Technology. The second is on July 30 and 31 in Raleigh at the McKimmon Center. The workshop will include in-class instruction and hands-on instruction visiting renewable energy technologies. Participants may earn 1.2 license renewal credits for the two-day workshop. For more information, call 828.262.7289.

ACADEMIC YEAR PROGRAMS

While the majority of Mathematics and Science Education Center programs take place in the summer, a significant number of activities also take place during the academic year. Pre-service teachers in math and science education courses as well as in-service teachers use the MSEC resources extensively. The science resource room contains kits, a variety of models (skeleton, digestive system, eye, ear, etc.), videos and DVDs, and print materials. The math resource room and math education library contain a wealth of useful materials and books. Numerous science and math education journals are available from which helpful articles may be photocopied without charge. Another much-used resource is the high-quality fossiliferous grit pile behind the Broyhill Inn and Conference

Center; bring your bucket and fill it anytime that you want to look for fossils.

Ten-hour workshops during the year are often on Friday evening and all day on Saturday. There are usually two Friday-Saturday workshops at the Catawba Science Center in Hickory. A workshop on marine science with an elementary-school focus was held in February and capitalized on the Center's new aquaria; Dr. Leslie Bradbury and Mr. Jeff Goodman, science educators at ASU, led the workshop. A second workshop will be held in May and will use the Catawba Science Center's planetarium for an astronomy workshop with a middle-school focus; the workshop will be led by Dr. Jon Saken of Appalachian's physics department. Dr. Debbie Crocker led calculator workshops in Watauga County and she and Dr. Betty Long led workshops in Burke County on using manipulatives in middle school math. New three-day workshops on science notebooking, one for elementary-school teachers and one for middle-school teachers, started in February and will conclude in April. Participants in the science notebooking workshops use science notebooks in their classes between the monthly meetings and use their students' work with notebooks as part of the notebook training. Dr. Brenda Evans, director of the North Carolina Infrastructure for Science Education (NC-ISE) at NC State University, is getting us started on the science notebooking workshops with a view toward our doing them on our own in the future. During the coming year, Dr. Anita Kitchens and Dr. Bob Wenta will offer a two-day workshop entitled: *Becoming a More Powerful Teacher of K-8 Mathematics*. This workshop focuses on both the affective and cognitive aspects of teaching, and has been evaluated highly.

DARWIN BICENTENNIAL CELEBRATION

The Thursday night science seminars recently concluded their seventh consecutive year. This year's focus on the environment and sustainable development proved to be popular, drawing some of the largest crowds ever from the general population in addition to science teachers. For the coming year, biologist Howie Neufeld and his committee have arranged an outstanding program to celebrate the life and work of Charles Darwin. Instead of arranging a separate seminar series for the coming year, we will piggyback on the program arranged by Dr. Neufeld and his committee. In addition to other activities, the prominent people who are visiting our campus as part of the Darwin celebration will be giving talks at 7:30 pm on the following dates:

- Sept. 16, 2008: Eugenie Scott, Director of the National Center for Science Education (Farthing Auditorium)
- Sept. 29, 2008: Jay Hosler, Juniata College, Neuroscientist, author of *The Sandwalk* (I.G. Greer Auditorium)
- Oct. 21, 2008: John Haught, Georgetown College, Theologian and Senior Fellow, Woodstock Theological Center (Farthing)
- Oct. 30, 2008: Ken Miller, Brown University, Cell biologist and textbook author (Powers Hall, Broyhill Inn and Conference Center)
- Nov. 13, 2008: Janet Browne, Harvard University, author of acclaimed biography of Darwin (Blue Ridge Ballroom, Plemmons Student Union)
- Jan. 22, 2009: Edward Larson, University of Georgia, Historian of Science of Evolution and Pulitzer Prize winner (Powers Hall)
- Feb. 2, 2009: Michael Ruse, University of Florida, Philosopher of Science (Farthing)
- Feb. 24, 2009: Sean Carroll, University of Wisconsin, Molecular Biologist and author of books on evolution, Morgan Lecturer in the Sciences for 2009 (Powers Hall)
- March 17, 2009: Paul Ewald, University of Louisville, Evolution and Disease, author of *Plague Time* (Powers Hall)

- April 2, 2009: Elisabeth Lloyd, Historian and Philosopher of Science (Blue Ridge Ballroom)
- April 6, 2009: Niles Eldredge, Curator, American Museum of Natural History, Paleontologist, author of *Darwin: Discovering the Tree of Life* (Powers Hall)
- Spring 2009 TBA: Jonathan Weiner, Pulitzer Prize winning author of *The Beak of the Finch*

All talks are free and open to the public. Teachers may earn 0.2 renewal credit for each seminar attended by making arrangements with the director of the Math and Science Education Center. There will also be affiliated events, such as a film festival on the subject of evolution, a play by the L.A. Theater on the Scopes Trial, a local production by the Department of Theater and Dance of the courtroom scene from *Inherit the Wind*, juried artwork and music compositions as well as special outreach events and panel discussions on Darwin's birthday, February 12, 2009. We hope to see many of you at these talks and events.

K-12 STUDENT PROGRAMS



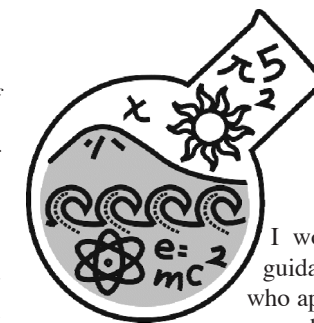
In addition to its primary emphasis on professional development for math and science teachers, the MSEC supports a number of K-12 student programs. We are pleased to continue the family math and family science night programs that involve students and their parents investigating together interesting facets of mathematics and science. Also popular are presentations for grades 3-9 classes on rocks, minerals, North Carolina geology, the Blackbeard shipwreck geo-archeology project, or another geology topic of your choice.

The Mathematics and Science Education Center is pleased to sponsor these activities at no cost to the schools.

Many students from **GEAR UP**, a federally funded program to increase academic ability and college preparation of middle and high school students from low-income schools, have visited campus during the year. The MSEC has arranged a variety of science activities for visiting classes from GEAR-UP schools as well as others. We will be pleased to arrange science or math programs for any schools that wish to visit campus.

The eleventh annual **Math Camp** for rising sixth to twelfth graders, sponsored by the Department of Mathematical Sciences and the Mathematics and Science Education Center, will take place July 7-10. Camp instructors are ASU math professors. Math Camp is from 6:00-9:00 pm each of the four evenings. Some of the activities include hands-on work with graphing calculators and computers, competitions, group interaction, prizes, snacks, fire-side chats (without the fire), and magic tricks that introduce algebra word problems. Real-world problems will answer the question, "What is math good for?" The cost of the camp is \$120 per student which includes instruction for 12 hours, limited accident illness insurance, certificates, awards, trophies, and snacks. For program information, contact Dr. Anita Kitchens (director) at (828) 262-2368/264-0181.

Camp Invention, a hands-on science enrichment program for students in grades K-5, will take place at the Living Learning Center on the ASU campus during June 23-27. The program, partially supported by the MSEC, will run Monday-Friday from 9:00 am to 3:30 pm. Detailed information may be found at www.pathways.appstate.edu.



SUMMER VENTURES IN SCIENCE AND MATHEMATICS

A note from Lori Tyler, Director
(tylerle@appstate.edu):

I would like to thank all of the teachers and guidance counselors for supporting the students who applied to attend Summer Ventures 2008. This year, we had a total of 78 students apply compared to only 47 applicants last year from our region! I was fortunate to visit many schools this past fall and will be contacting you and/or your school guidance counselors beginning in October to recruit for SV 2009. Please contact me if you would like to schedule a classroom visit to show our video or display to be set up during lunches/breaks. If you have other ideas about sharing information about Summer Ventures, I would be happy to hear from you. Next year is the 25th Anniversary of this fantastic program and we need to get more of our region's students involved! Please visit our website for further information: <http://www.summerventures.appstate.edu> or <http://www.summerventures.org>.



Notes from the Director

From reading the newsletter, you will see that this has been another busy year for the Math and Science Education Center with a busy summer to come. Superintendents, principals, and curriculum specialists have been informed of the upcoming summer institutes that have fees; ask an appropriate administrator about funding the programs that interest you. We are pleased with the level of support that has been given to our programs by local school administrations, especially of the *Statewide Institute for Teaching Excellence* (SITE) program. For detailed information or to register for any programs (except MELT), visit www.msec.appstate.edu or contact Ms. Vickey Isaacs at isaacsve@appstate.edu or 828/262-3185. Also, contact Vickey to add your name to our regular mail list or e-mail listserv. The regular mail list is primarily used to send the twice yearly newsletter and the e-mail list is primarily used for announcing workshops and institutes. For programs offered through MELT, contact Ms. Diana Ward (wardrd@appstate.edu or 828/262-2360) or visit www.melt.appstate.edu.

We are fortunate in continuing our partnership on two Mathematics and Science Partnership (MSP) grants totaling more than \$1.7 million. MSP grants are from federal funds from the No Child Left Behind Act; the funds are administered by the North Carolina Department of Public Instruction. The two partnerships are with the Northwest Regional Service Alliance for teachers of K-5 mathematics and with Cleveland, McDowell and Rutherford counties for teachers of grades 7-8 science.

Please continue to let us know of any special professional development needs that you have in your local school systems. We have a number of programs running currently in near-by school systems, and we are always pleased to work with you on mathematics and science professional development programs.

Phil Johnson