Obama expands STEM campaign

Universities pledge to train more math, science teachers

President Obama announced on Jan. 6, 2010, a plan to expand his “Educate to Innovate” campaign, which aims to lift American students to the top of the pack in science, technology, engineering and mathematics (STEM) achievement over the next decade.

In addition to the five public-private partnerships President Obama outlined in November, five new partnerships were announced that will prepare more than 10,000 new math and science teachers over the next five years and will support the professional development of more than 100,000 current teachers in STEM fields.

The 10 partnerships now associated with the campaign are: Time Warner Cable’s “Connect a Million Minds” Campaign; Discovery Communications’ “Be the Future” Campaign; Sesame Street’s Early STEM Literacy Initiative; “National Lab Day,” Bringing Hands-on Learning to Every Student; National STEM Game Design Competitions; Intel’s Science and Math Teachers Initiative; expansion of the National Math and Science Initiative’s UTeach Program; The PBS Innovative Educators Challenge; Woodrow Wilson Teaching Fellowships in Math and Science; and the commitment of several public research universities to train 10,000 math and science teachers annually by 2015.

The Association of Public and Land-grant Universities (APLU) started this commitment to train more teachers through its Science and Mathematics Teacher Imperative.

“The quality of math and science teachers is the most important single factor influencing whether students will succeed or fail in science, technology, engineering and math.”
- President Obama

Summer Education OPPORTUNITIES

- WHAT: Nebraska Math & Science Summer Institutes (NMSSI)
- WHEN: Summer 2010 (sessions between June 7 and July 23).
- See a course calendar on Page 4 of this newsletter.
- WHERE: Lincoln, Omaha, Kearney, Columbus, Neligh, Norfolk or Scottsbluff
- HOW: Save a place in a course by going to http://scimath.unl.edu/nmssi. Registration begins March 8.
- FELLOWSHIPS ARE AVAILABLE!

See Story on Page 4

In this Issue:
» Obama expands STEM campaign ............ Page 1
» NMSSI courses for Summer 2010 ........ Pages 1, 4
» Larson elected to NCTM board ............... Page 2
» Andrews nominated A+ Educator of Week ... Page 2
» NebraskaMATH Summer Calendar .......... Page 2
» Math Challenge Corner ....................... Page 3
» Resources: Math education for preschoolers . Page 3
» NMSSI Summer Calendar ................... Page 4
» Nominate K-6 teachers for presidential award . Page 5

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Matthew R. Larson, Curriculum Specialist for Mathematics at Lincoln Public Schools, was one of four individuals to be elected to the 2009 National Council of Teachers of Mathematics Board of Directors.

Larson is a member of the NebraskaMATH leadership team, and in particular, plays a major role in guiding the Primarily Math program.

The following four educators were elected to serve three-year terms: Anne M. Collins, Lesley University, Cambridge, Mass.; Debbie Duvall, Elk Island Public Schools, Edmonton, Alberta; Larson, Lincoln Public Schools; and Kimberly Mueller, Florence L. Walther School, Lumberton, N.J.

The new members’ terms of service (2010–2013) will begin at the conclusion of the NCTM Annual Meeting in San Diego in April 2010. The Board of Directors makes decisions about Council actions, policies and programs.

Delise Andrews, a district math coach for Lincoln Public Schools, was nominated as the A+ Educator of the Week for Dec. 14, 2009, by her colleague, Sherri Day, a second-grade teacher at Hill Elementary School.

Day met Andrews through a Nebraska Math and Science Summer Institutes course, which Andrews was teaching. Day said Andrews stayed late to help her and encouraged her not to give up when Day became overwhelmed by the coursework.

“I am a better teacher because of her,” Day said.

Andrews has worked in the education field for 14 years. She works primarily with LPS teachers of fifth- and sixth-grade mathematics.

The Lincoln Journal Star features a notable teacher from Lincoln or Southeast Nebraska each week.
The Monty Hall Problem

Featuring the work of Brian Johnson, M² Cohort 4

Seasoned readers might recall the original version of the game show “Let’s Make a Deal” featuring host Monty Hall. The show debuted in 1963 and successfully continued through the rest of the 1960s and ’70s. In September 1990, the show received renewed attention when a mathematical problem based on a game played during the show appeared in the Marilyn vos Savant syndicated newspaper column. More recently, this problem was addressed in a lecture setting during a 2005 episode of the CBS drama “NUMB3RS.”

One version of the problem reads as follows:

In the game show “Let’s Make a Deal,” host Monty Hall would present a contestant with three doors. Behind one door is a car; behind each of the other two doors is a goat. Without knowing which door hides the car, the contestant selects one door. Without revealing what is behind this door, Monty opens one of the other doors to display a goat. Monty then offers the contestant the opportunity to keep his or her original door or switch to the other unopened door. The contestant then will win whatever is behind the final door. If the contestant wishes to win the car, should he or she switch doors?

To analyze the problem, a reader might consider performing a series of experiments and tabulating the outcomes. Other readers might draw upon their understanding of probability, conditional probability and dependent vs. independent events. Perhaps, it does not matter whether the contestant switches doors because, after all, there are two unopened doors, and therefore a 50% chance that the car is behind the original door and a 50% chance that it is behind the new door. Or, does the fact that there were originally three doors from which to choose somehow affect the solution?

Although the problem itself is easy to understand, its solution sparked a national debate among experienced mathematicians.

For a full, easy-to-read analysis of the mathematical concepts required to solve this problem, and for ideas on how to design a lesson on it in a middle level classroom, read Brian Johnson’s paper at http://scimath.unl.edu/MIM/mat.php.

Resources

www.buffalo.edu/news/hires/ClementsSchool99.jpg

Julie Sarama (left) and Doug Clements work with students

Studying math education for preschool children

For decades, researchers and educators have assumed that children were not able to learn math before the age of 5. However, recent studies show preschool-age children can perform basic division, recognize geometric shapes and grasp informal geometric definitions, just to name a few.


The NebraskaMATH Primarily Math initiative uses a textbook written by Sarama and Clements, married and colleagues at Buffalo’s graduate school of education, called “Learning and Teaching Early Math: The Learning Trajectories Approach.” To find out more about the goals of Primarily Math, see http://scimath.unl.edu/primarilymath/

For more details on Building Blocks, please visit: http://gse.buffalo.edu/org/buildingblocks/index_2.htm.

Math Challenge Corner
In Summer 2010, the UNL Center for Science, Mathematics & Computer Education (CSMCE) will be making an unprecedented effort to encourage Nebraska’s K-12 math and science teachers to enroll in professional development opportunities offered through combined efforts of UNL and Nebraska ESUs. We invite math and science teachers to i) consider whether one or more of the courses is right for them and ii) to tell colleagues about the availability of these courses.

The goal of the Nebraska Math & Science Summer Institutes (NMSSI) program is to offer intellectually rich graduate coursework that will enhance teachers’ ability to offer their students challenging courses and curricula. For Summer 2010, we have scheduled 15 math or math education courses and 10 science or science education courses. See the calendar to the right for a listing of the courses or visit our Web site at scimath.unl.edu/nmssi.

In addition to courses held on the UNL campus, NMSSI will offer courses in five other locations – Columbus, Kearney, Neligh, Omaha and Scottsbluff.

Nebraska teachers who take NMSSI courses qualify for reduced tuition rates and fellowships to cover the cost of fees. Thus they pay approximately two-thirds the normal costs associated with summer courses. In 2010, thanks to the support of several UNL departments, Nebraska math and science teachers are also eligible for supplemental fellowships that should make the program even more affordable.

Indeed, for Nebraska math and science teachers, there is such a thing as a free lunch! Lunch will be provided for all participants at all sites.

NMSSI courses are designed with teachers’ schedules in mind. A typical course offers 40 hours of face-to-face instruction concentrated into a one-week period, or a pair of courses, each having 40 contact hours over a two-week period. Some courses, especially the science courses, include an

Course titles and full descriptions can be found online at: http://scimath.unl.edu/nmssi

Continued on Page 5
To apply for a supplemental fellowship through the NMSI Fellowship Program, please visit [http://scimath.unl.edu/nmssi/2010/fellowships.php](http://scimath.unl.edu/nmssi/2010/fellowships.php). Three types of fellowships are available:

i. A supplemental tuition fellowship that partially or completely covers the teachers’ tuition responsibility;

ii. A travel/subsistence fellowship that supports teachers who must travel to take a NMSSI course; and

iii. A book fellowship that covers the cost of books needed for a course.

### Nominate teachers for presidential award

As 2010 begins, it is time to think about nominating an outstanding K-6 mathematics or science teacher for the 2010 Presidential Awards for Excellence in Mathematics and Science Teaching. The awards are the nation’s highest honors for teachers of mathematics and science, recognizing them for their contributions in the classroom and to their profession.

The deadline for nominations is April 1. Once nominated, teachers will receive an invitation to begin the application process. The application deadline is May 3, 2010.

Nebraska science teacher Loreen Whalen-McMains of Omaha Public Schools was a recipient of the 2009 Presidential Award. Deb Romanek, director of mathematics for the Nebraska Department of Education, is urging Nebraskan educators to nominate outstanding elementary math teachers for the Presidential Award as a significant number of nominations at the state level increases the potential that applications will receive national review.

Eligibility requirements and the nomination form can be found online at [https://www.paemst.org/controllers/nomination.cfc?method=nominate](https://www.paemst.org/controllers/nomination.cfc?method=nominate). You will need some basic contact information for each nominee so you can complete the online form. Please note that nominations for secondary school teachers (grades 7-12) will be accepted next year.

This commitment is a significant increase from the 7,500 teachers currently trained by the universities that participate in SMTI. The letter also mentions a pledge by more than 40 SMTI public research university and university system members to at least double the number of science and mathematics teachers they graduate by 2015. The letter was signed by the presidents and chancellors of 79 of the 121 participating SMTI institutions.

University leaders will assess and scale programs that have a strong track record of success, create new preparation models, ensure that teaching is valued as a career option, and work closely with states to address teacher shortages.

“The quality of math and science teachers is the most important single factor influencing whether students will succeed or fail in science, technology, engineering and math,” President Obama said in a news release. “Passionate educators with issue expertise can make all the difference, including girls and underrepresented minorities—and preparing them to tackle the grand challenges of the 21st century such as increasing energy independence, improving people's health, protecting the environment, and strengthening national security.”

The President also honored more than 100 outstanding math and science educators, the latest winners of Presidential awards for excellence in STEM teaching and mentoring.

President Obama started the “Educate to Innovate” campaign due to the substantial teacher shortage in STEM fields. Up to 1 million teachers will need to be recruited over the next five years, and vacancies in math and science are often among the hardest to fill. The President challenged governors, philanthropists, scientists, engineers, educators and the private sector to join with him to find innovative new ways to recruit, train, reward, and retain teachers.