PCSM NEWSLETTER

Leaders in Mathematics Education **Fall 1999**

PENNSYLVANIA COUNCIL OF SUPERVISORS OF MATHEMATICS

PRESIDENT'S MESSAGE

From the President

- Genevieve Battisto

The Fall of 1999 represents a first for PCSM as the Executive Board meets at the NCTM Regional in Pittsburgh. Previously, the Executive Board has convened at the PCSM Annual Meeting only. Issues of promoting PCSM membership among math leaders and the organization's response to Standards 2000 were unresolved in the Spring and the Board wished to provide more continuity for the conversation. Members who wish to contribute ideas on these or other topics should contact me or any member of the Executive Board.

Promoting math leadership and Standards 2000 are integrally related. It is unfortunate, but all too true, that many schools across the commonwealth have yet to take serious heed of the NCTM Curriculum and Evaluation Standards for School Mathematics first released in 1989. The pattern is clear that schools with no identified mathematics leadership lag seriously behind in reform of curriculum and instruction. Spreading the message of Standards 2000 will require a network capable of reaching both public and private institutions.

The draft of Standards 2000 (Principles and Standards for School Mathematics: Discussion Draft, October, 1998) states in The Technology Principle, "Mathematics instructional programs should use technology to help all students understand mathematics and should prepare them to use mathematics in an increasingly technological world." (p. 40) This principle could be directed toward the dissemination of Standards 2000. The electronic version of the draft is available on CD-ROM and at <http://standards-e.nctm.org>.

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The electronic conversations which are now possible among educators in even the most remote locations provide a vehicle not widely available just ten years ago. It is a challenge to PCSM as an organization and to members throughout the state to optimize the use of technology in helping all teachers understand Principles and Standards for School Mathematics and to prepare them to use the document in an increasingly complex and challenging classroom world.

I hope that many of you are able to enjoy the beauty of Fall in Western Pennsylvania at the NCTM Regional Conference in Pittsburgh in October.

Genevieve Battisto
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Please note that the telephone area code for Northeastern Pennsylvania has changed from 717 to 570

NATIONAL METRIC WEEK

October 10-16, 1999, is National Metric Week in the U.S. For information and links to useful sites visit <www.forum.swarthmore.edu> for the Math Forum Internet Newsletter No. 4.40 (4 Oct 1999).

From the Editor

- Arlene Dowshen

Greetings to all PCSM members! I hope that all of you had an enjoyable summer and feel prepared to face the excitement and challenges of a new school year. Have you attended an inspiring conference? Is your school or school district involved in adopting a new mathematics curriculum or are you excited about the mathematics program currently in use? Have you been involved in any projects funded by state or federal grants? If your answer is yes to any of these questions, please consider sharing your experiences with all of us by submitting an article for the newsletter.

At a TIMSS conference in Philadelphia last week, I had the pleasure of meeting Dr. Frank Marburger, the new Mathematics Education Advisor, Division of Arts, Sciences, Communications and Mathematics, for the Pennsylvania Department of Education. He has promised to have a message for us in our next newsletter. Frank can be reached at (717) 772-6904, fax: (717) 783-3946 or email: 00matha1@pde.psu.edu and looks forward to hearing from PCSM members.

Please share the newsletter with your colleagues and encourage other mathematics leaders in your schools or communities to join PCSM. A membership application is included in the newsletter; please duplicate as needed. Please duplicate and post the included PCTM conference announcement.

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NCTM REPRESENTATIVE REPORT

NCTM News Bits

As of June, new and renewing NCTM members can join for up to three years with multi-year memberships.

Plan for Metric Week, October, 10-16, 1999. Request a free Teacher Metric Kit from NIST (National Institute of Standards and Technology), email: metric_prg@nist.gov. Another source for materials is the US Metric Association (USMA). (More info, see page 2.)

NCTM's 78th Annual Meeting in Chicago is 13-15 April 2000. The updated Standards will be presented. Volunteer to be a part of the conference by choosing to help on one of the following committees: extended session support, evaluations, hospitality, meeting rooms, signs, student hosts, make and take it, NCTM Materials, membership, publicity, speaker support, special needs or technology. Contact Simonette Urbain at samu303@ad.com.

WLME6 (World's Largest Math Event) will feature activities related to animals on April 28, 2000.

Think about applying for one of the many NCTM grants and awards. Applications are available through email:
infocentral@nctm.org
or visit NCTM's Web site <www.nctm.org>.

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Subscribe to NCTM's WebNews which informs you about the latest news and resources available from the NCTM Web site (<www.nctm.org>). WebNews comes out once per month.

FIGURE THIS! MATH CHALLENGE PARTNERSHIP WILL BE LAUNCHED IN NOVEMBER

The *Figure This!* Mathematics Challenge campaign will be launched in November. The tentative date is November 18.

Figure This! is an initiative geared to promote mathematics education awareness in the middle grades. The goal of this initiative is to show families the challenging mathematics middle school students should be learning and to emphasize the importance of a high-quality mathematics education.

Figure This! is a two-year campaign with approximately 80 mathematics challenges to be developed and released. The mathematics challenges will appear in major media outlets, on product packaging, in public service advertising, and in other marketing and communication venues.

Family Materials
Family materials are also being developed and include brochures with information to help families and caregivers play a positive and active role in their child's mathematics education. The brochures include sample questions to ask of teachers and administrators to learn more about the child's mathematics education; helpful information on how to prepare students for education after high school; and encouraging suggestions to help families work with their children through math homework.

Web Site
Challenges and all related information will be available to download from the *Figure This!* Web site at <www.figurethis.org>. The Web site will provide an interactive opportunity for families to solve exciting mathematics challenges.

Toll-free Number
Answers to, and hard copies of, the challenges as well as all family materials, may be requested by calling, toll-free (1-888-GO-SOLVE). Due to limited quantities and the expected high-demand, only one copy of the challenges will be provided per person.

The National Science Foundation (NSF) and the U.S. Department of Education have provided funding for this initiative.

UPCOMING EVENTS

NCTM Eastern Regional Conference
October 13-15, 1999, Pittsburgh, PA
(See page 6 for more details.)

Core-Plus Mathematics Project (CPMP), leadership Institute and Users' Conference
November 5-6, 1999, Sheraton Reston Hotel, Reston, VA. CPMP through grants from NSF and Everyday Learning Corporation is sponsoring a joint two-day Leadership Institute and Users' Conference. For more information call 616-387-4562; email: cpmp@wmich.edu; Web site: <www.wmich.edu/cpmp>.

University of Chicago School Mathematics Project (UCSMP) Fifteenth Annual Secondary Conference
November 6-7, 1999, University of Chicago, Chicago, IL. The registration deadline for the conference is October 17, 1999. Preregistration is required. The application deadline for the master classes is October 7, 1999. For more info contact Carol Siegel at 773-702-1130, email: ucsmp@uchicago.edu or visit their Web site <www.uchicago.edu/ssd/ucsmp>.

National Research Council, Convocation on TIMSS for State and District Mathematics and Science Leaders
November 19-21, 1999, Washington, D.C. The convocation will be the capstone event of a project funded by the U.S. Department of Education entitled "Global Perspectives for Local Action: Using TIMSS to Improve U.S. Mathematics and Science Education." For more information and application, call Alfred Young at 202-334-1498 or by email: ayoung@nas.edu.

U.S. Department of Education Regional Conference on Improving America's Schools (IAS), Professional Development for Teachers of Mathematics
December 15-17, 1999, Chicago, IL. For more information call 1-800-203-5494 or visit the IAS Web site: <www.ncbe.gwu.edu/iasconferences.>

Intergovernmental Technology Conference (ITC East '99)
December 7-8, 1999, Hershey, PA. While not an education conference, it is a great opportunity to see some cutting edge technologies along with companies that could assist school districts with administrative functions. Visit the Web site for more information: <http://govresources.com/penn/index.html>.

Association of Mathematics Teacher Educators (AMTE) Winter 2000 Conference
February 10-13, 2000, Charolette, NC
Visit the AMTE Web site for more information: <www.ceemast.csupomona.edu/amte/>.

International Consortium for Research in Science and Mathematics Education (ICRSME)
February 1-4, 2000, San Jose, Costa Rica. The theme for the program is Mathematics, Science, and Technology Education for the 21st Century. For information call 614-292-8061 or 614-292-2943 or email: White.32@osu.edu or Berlin.1@osu.edu.

The 27th Annual Meeting of the Researach Council of Mathematics Learning (RCML)
March 9-11, 2000, Las Vegas, Nevada. For more information visit the RCML Web site: <http://www.unlv.edu/RCML>.

PCSM Annual conference
March 23, 2000, Harrisburg, PA.

PCTM Annual Conference, Math for the Millennium
March 23-25, 2000, Harrisburg, PA.
(See enclosed flyer for more information.)

NCTM 78th Annual Meeting
April 13-15, 2000, Chicago, IL

A Future Mathematics-Science Classroom

Gene Fiorini, Shippensburg University

The New York Times (Science Section, 1/5/99) recently reported that an article in the journal Science had established a connection between a 90% plunge in the Aleutians' sea otter population and killer whales. It seems that after centuries of peaceful coexistence the whales suddenly began eating the sea otters. Marine ecologists discovered the reasons for the whale's altered diet only after an extensive decades-long "detective hunt" that covered over 2000 miles in the northern Pacific Ocean. What the study revealed was a glimpse into nature's complexity and interconnectedness showing "a huge slice of ecological reality encompassing both the broadest dimensions and most spectacular inhabitants of the marine environment as well as its minute creatures and relationships." An "elegant web of existence" had been perturbed and the otters, it was discovered, were a crucial link in holding that web together.

The size and scope of this study are indicative of a trend taking place in science today. Most "traditional" scientific research projects are too short and too small to have discovered an inter-species cascade effect of such "expansive dimensions." It is becoming apparent to scientists that we need each other's expertise in differing fields in order to develop a more accurate representation of the natural world around us. This, at least in part, is due to improvements in technology and communications. Recent technological advances have greatly improved the ability to simulate large-scale, interconnected environments making such projects more feasible. Scientists are moving to take advantage of these advances by suggesting more complex projects that will lead to new insights and knowledge as to the interdependence of natural environments.

Within the next ten years I believe the Science and Mathematics education community will begin to echo their research counterparts in industry and academia. Increasingly, scientists are studying the interdependence that different fields have on each other. It will fall to the students who "come of age" over the next decade to determine answers to how to best use the remaining non-reusable resources as well as develop reusable resources to take their place. At the same time, technology is advancing at such a dizzying pace it is difficult, if not impossible, to predict where technology will be ten years from now. It is entirely conceivable that today's students will need to be efficient with a technology that has yet to be invented. Technology, most certainly, will have a place in tomorrow's classroom. However, I see its role more as a supporting one rather than as a catalyst for the curriculum.

If tomorrow's professionals are going to be asked to find long-term solutions to the environment's and society's problems today's students will need to develop their problem-solving and critical-thinking skills. This is certainly consistent with the goals outlined in the Principles and Standards for School Mathematics (draft, 1999) published by the National Council of Teachers of Mathematics (NCTM). Among other recommendations, the NCTM Standards encourages teachers to develop mathematical concepts by associating abstract concepts with concrete examples and activities. The Standards also recommends greater communication between academia and industry. Programs are appearing on campuses around the country that coordinate courses and activities between disciplines. The emphasis of these activities is on developing problem-solving and critical thinking skills. It is possible, however, to create interdisciplinary programs within existing academic structures, of which a few simple suggestions are listed here:

- Talk across disciplines. Try to create opportunities during a school day to talk with colleagues across disciplines. Conversing about each other's scientific disciplines is a great way to develop ideas that would relate to both fields.

- Integrate class activities. The conversations with colleagues could easily lead to developing activities that use concepts from both disciplines. These activities could be assigned independently to students in either class.

- Cluster scheduling. Many schools have cluster scheduling. This is the practice of giving groups of students common schedules so that they can coordinate study times, projects, etc. This can be done when there are large groups of students who are required to take a common set of courses. Instructors of clustered students could easily coordinate interdisciplinary assignments and activities.

- Back to back "block" scheduling. Many schools are adopting block scheduling for individual classes. However, if two non-blocked courses are scheduled with common enrollments, then instructors could use

  the "double" period as a joint interdisciplinary class where the concepts of both classes are discussed throughout the double period.

- Guest instructors. In those instances when common class rosters are not possible, it is still possible to

- present interdisciplinary topics. Every course presents concepts that rely on topics from other fields. Those concepts can be presented to a class by another instructor from that field. Inviting other instructors to your class impresses upon students the need to share ideas across disciplines.

- Interdisciplinary assignments. If other instructors are not available to approach the class, have the class approach the instructors. Create activities and assignments that require the students to seek out the advice and expertise of instructors or experts in other fields.

These are a few simple suggestions for instructors to start developing interdisciplinary problem-solving skills. Perhaps the most important one is the first one, to talk among your colleagues. To remain an optimist in the face of predictions such as exhausting limited resources, dizzying technological advances, increasing populations, shrinking habitats, etc. will require an improved ability to problem-solve across disciplines. Since scheduling assignments vary from school to school, the best way to determine how to take advantage of this is through discussions among colleagues.

Teacher Instructional Modules (TIMS) from INFORMS (The Institute for Operations Research and the Management Sciences)

Those of you who are also NCSM (National Council of Supervisors of Mathematics) members should have received two TIMS from INFORM this summer ("Sales Counter at Arm-and-a-Leg Tickets" and "Service Woes at Speedy Delivery") and a copy of a video, "Operations Research: Science and Technology for Informed Decision Making." The two modules are wonderful examples of mathematical modeling which are appropriate for a high school mathematics classroom. The video is scheduled for broadcast by satellite feed to Public Broadcasting System (PBS) affiliates on October 13 and November 17, 1999.

The video segment is about mathematicians and scientists who make a profound effect behind the scenes in many aspects of modern life. With the airing of this program, viewers will learn about the impact of mathematics on the war against cancer and the conflict in Yugoslavia, as well as such topics as reducing the wait for rides at Disneyworld and the hunt for the SS Central America, an American ship laded with gold that sank during a storm before the Civil War.

Contact your local PBS affiliate to encourage them to broadcast this wonderful program. (A listing of PBS affiliates is available online at <http://www.pbs.org/stations/>.)

If you are not an NCSM member and would like to receive a copy of these materials, contact:

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Chair: INFORMS/PAC
5809 Clermont Drive
Alexandria, VA 22310-1433
fax: 703-922-6775

Electronic Resources

Receive a free subscription to *ENC (Eisenhower National Clearinghouse for Mathematics and Science Education) Focus: A Magazine for Classroom Innovators*, call (800) 621-5785 or go to <http://www.enc.org/order/> to get on the mailing list.

Jim Bowen, a math teacher at Stillwater High School in Stillwater, OK, has written a Web site to teach high school students how to program their TI-86 graphics calculators. He welcomes you to visit <http://members.fullnet.net/jbowen>.

NCTM's Legislative and Policy Updates Available on the Web. NCTM posts a weekly Legislative and Policy Update on the NCTM Web site at <www.nctm.org/publications/govt/index.html>. To subscribe to the NCTM Legislative and Policy Update list serve, send your request by email to jrussell@nctm.org. For daily updates on congressional activities go to C-SPAN's Web site at <http://congress.nw.dc.us/c-span/>, and for an email directory of Congress, go to <http://congress.nw.dc.us/c-span/elecmail.html>.

Great Problem of the Week Site (other than the Math Forum) features grade level appropriate math problems for students to solve that facilitate critical thinking and problem solving skills: <http://www.olemiss.edu/mathed/problem.htm>.

Puzzlemaker offers forms to help create ten kinds of computer-generated puzzles, including number clocks and math squares: <www.puzzlemaker.com>.

Pieces and Creases is a fun guide to origami created by 5th graders. Check it out at <http://tqjunior.advanced.org/5402>.

Readings for Professional Development

So little time and so much to read. Here are some suggestions:

Knowing and Teaching Elementary Mathematics, Teachers Understanding of Fundamental Mathematics in China and the United States by Liping Ma (Lawrence Erlbaum Associated, 1999). On the back cover Richard Askey is quoted, "Liping Ma's work has given me hope about what can be done to improve mathematics education. She illustrates what 'profound understanding of fundamental mathematics' is for elementary school teachers and has some useful suggestions about what we can do to help more teachers acquire this knowledge." This book is available from RBS (Research for Better Schools); contact Carol Crociante (215-574-9330, ext. 280) or email her at crociante@rbs.org.

If you have read much about the results of the TIMSS (Third International Mathematics and Science Study), you will be fascinated by Educating Hearts and Minds, Reflections on Japanese Preschool and Elementary Education by Catherine Lewis who lived and worked in Japan for three years. The book was published by Cambridge University Press in 1995; see <http://www.cup.org>.

A must read from The Mathematics Teacher, September, 1999: "Assessing True Academic Success: The Next Frontier of Reform" by Dan Kennedy (pp. 462-466). The author offers several thoughtful and well-reasoned ideas regarding assessment and reform.

Sheila Ebbutt outlines a strategy for parents on how they can help their child in math in "A better equation," available online <http://www.educationunlimited.co.uk/egweekly/story/>.0,5500,86373,00.html>.