

# Math<sup>in</sup> Middle<sup>the</sup>

## Institute Partnership

MAKING AN IMPACT:  
FINAL REPORT 2004-11





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“THE M<sup>2</sup> PROGRAM COULD NOT COME AT A BETTER TIME WHEN OUR NATION IS EMPHASIZING MATH ACHIEVEMENT. THINKING, CONNECTING AND PROBLEM SOLVING AT A YOUNG AGE WILL BENEFIT STUDENTS IN THEIR FUTURE ENDEAVORS AND OPEN DOORS OF OPPORTUNITY TO CAREERS THAT MAY YET BE DISCOVERED.”



**ALI ARNDT, LUX MIDDLE SCHOOL, LINCOLN PUBLIC SCHOOLS  
MATH IN THE MIDDLE COHORT 4**

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## BY THE NUMBERS

**\$5.9M**

Amount awarded by the National Science Foundation for the Math in the Middle grant

**83**

Combined total of faculty and graduate students who have served on instructional teams or conducted research

**156**

Number of Nebraska mathematics teachers who earned master's degrees through the M<sup>2</sup> Institute

**148**

Total number of presentations through August 2011 given locally, nationally and internationally about M<sup>2</sup>

**42**

M<sup>2</sup> teachers have later worked as a master teacher as part of the instructional team for a course for teachers

**92%**

156 of 170 teachers earned master's degrees through M<sup>2</sup> for this remarkable success rate

**\$13.4M**

The success of M<sup>2</sup> has helped bring another \$13.4 million in NSF funding to benefit K-12 mathematics education in Nebraska: NebraskaMATH: \$9.2 million, NebraskaNOYCE: \$3 million and Data Connections: \$1.2 million.



**COHORT 1:** ANNE SCHMIDT (LEFT, FRONT), KYLE POORE, JIM PFEIFFER, INSTRUCTOR CHERYL MINER AND JANET SCHLATTMAN DISCUSS THEIR POSTER DURING CLASS.

# MAKING AN IMPACT: FINAL REPORT 2004-11

**S**even years, scores of teachers, thousands of students. As the \$5.9 million Math in the Middle (M<sup>2</sup>) Institute Partnership came to a close in 2011, the grant and its success has had an enormous impact, greatly benefitting K-12 mathematics education in Nebraska’s schools. “Making an Impact: Final Report 2004-11” looks back at the scope of the partnership and the outcomes of its teaching methods and research.

The Math in the Middle Institute Partnership proposal, awarded by the National Science Foundation to the University of Nebraska–Lincoln’s Center for Science, Mathematics & Computer Education (CSMCE), was written in Fall 2003 by a



**JIM LEWIS**



**RUTH HEATON**



**TOM MCGOWAN**



**BARB JACOBSON**

team of Principal Investigators that included UNL’s Jim Lewis, Aaron Douglas Professor of Mathematics at UNL and Director of the CSMCE; Professors Ruth Heaton and Tom McGowan of the UNL Department of Teaching, Learning and

Teacher Education; and Barb Jacobson, Director of Curriculum at Lincoln Public Schools (LPS). The institute committed to establish a relationship with rural communities. Thus, in addition to partnering with LPS, three rural Educa-

tional Service Units (6, 7, 13) – and through them, the districts they support – were identified as core partners. During the life of the grant, the program was open to teachers from across Nebraska, resulting in the participation of 67 districts.

Because of legislatively mandated district consolidation, the number of rural districts where M<sup>2</sup> graduates are currently teaching is now 57.

In 2008, a Robert Noyce supplement brought in the Omaha Public Schools, the state’s largest and most diverse district, as another core partner, leading to 31 OPS teachers earning their master’s degrees as part of M<sup>2</sup> between August 2010 and August 2011. One OPS teacher was chosen by Northwestern University to be a Teacher in Residence (see Page 9).

The success of the Math in the Middle partnership has had a direct impact on the CSMCE’s ability to develop NebraskaMATH, a larger and more ambitious award. Along with university funds from the Math and Science Teachers for the 21st Century Program of Excellence, this grant has made way for a transition to building a broader, sustainable statewide partnership that continues with NebraskaMATH and has been the basis for the CSMCE’s mission of supporting teachers, schools and districts in Nebraska.

## IMPACT: Teacher Knowledge

The Math in the Middle Institute targeted middle level mathematics teachers, those teaching math in grades 5 through 8. Given the nature of Nebraska schools, the institute accepted participants whose teaching responsibilities included most grades K-12. Rural teachers are sometimes the only mathematics teacher for a secondary school or one of very few teachers, and thus teach grades 7-12. Over the seven years of the grant, teachers also changed their teaching assignments.

The original proposal included funds to support 122 teachers and emphasized working with teachers from the Lincoln Public Schools or from rural school districts. By carefully using resources and accessing local resources, 136 teachers were accepted in the graduate program and 125 of them earned their master's degree through the first four cohorts. The two Noyce supplements enabled Math in the Middle to extend its partnership to work with 24 teachers from OPS, and an additional seven teachers were funded through other funds. Thus, 31 OPS teachers earned their master's degrees as part of M<sup>2</sup> between August 2010 and August 2011.

Taken together, 156 of 170 teachers who began the Math in the Middle graduate program have earned their master's degrees, a total that is more than the number originally envisioned by the project and represents a remarkable 92 percent success rate.

Evidence of the grant's focus on rural teachers can be seen in the geographical distribution of teachers that participated. Eighty-four of the teachers who have earned their master's degrees by participating in the M<sup>2</sup> Institute teach in one of 57 rural Nebraska school districts, the largest of which has only 5,218 students. Reflecting the rural nature of Nebraska and the emphasis placed by the project on working with rural teachers, schools and districts, 43 of those districts have fewer than 1,000 students and 25 serve fewer than 400 students.

The period of the grant (2004-2011) has been a period of school closure, significant consolidation of small rural districts (as mandated by state law) and financial stress for districts in Nebraska. This, together with the normal movement of teachers from one school or district to another has

resulted in many teachers teaching in a different school or district from the one they taught in when they began the program. In addition, several teachers have new roles as a result of opportunities connected to their growth as teacher leaders.

In the table below, the number of graduates of the program is organized by the state's ESUs and their current position. Because of our original focus on rural districts we did not work with teachers from ESU 3, which serves the metropolitan Omaha area.

ESU	Districts	Schools	Teachers
1	2	2	2
2	4	4	5
3	0	0	0
4	1	1	1
5	1	1	1
6	6	8	12
7	7	8	10
8 <sup>1</sup>	6	7	9
9	7	8	8
10	7	9	11
11	4	5	7
13 <sup>2</sup>	6	6	12
15	3	3	3
16	4	4	4
17	*	*	*
LPS <sup>3</sup>	1	16	34
OPS <sup>4</sup>	1	21	32
Non-NE <sup>5</sup>		3	3
UNL <sup>6</sup>		2	2
<b>TOTAL</b>	<b>60</b>	<b>108</b>	<b>156</b>

Note: Due to consolidation, ESUs 12 and 14 no longer exist.

\* One teacher from ESU 17 retired (due to health reasons) and did not complete his master's degree. He does remain active in Nebraska's NCTM affiliate.

<sup>1</sup> Includes 1 in a professional development role at the ESU office and 1 new part time math coach

<sup>2</sup> Includes 1 as district math coach (Scottsbluff)

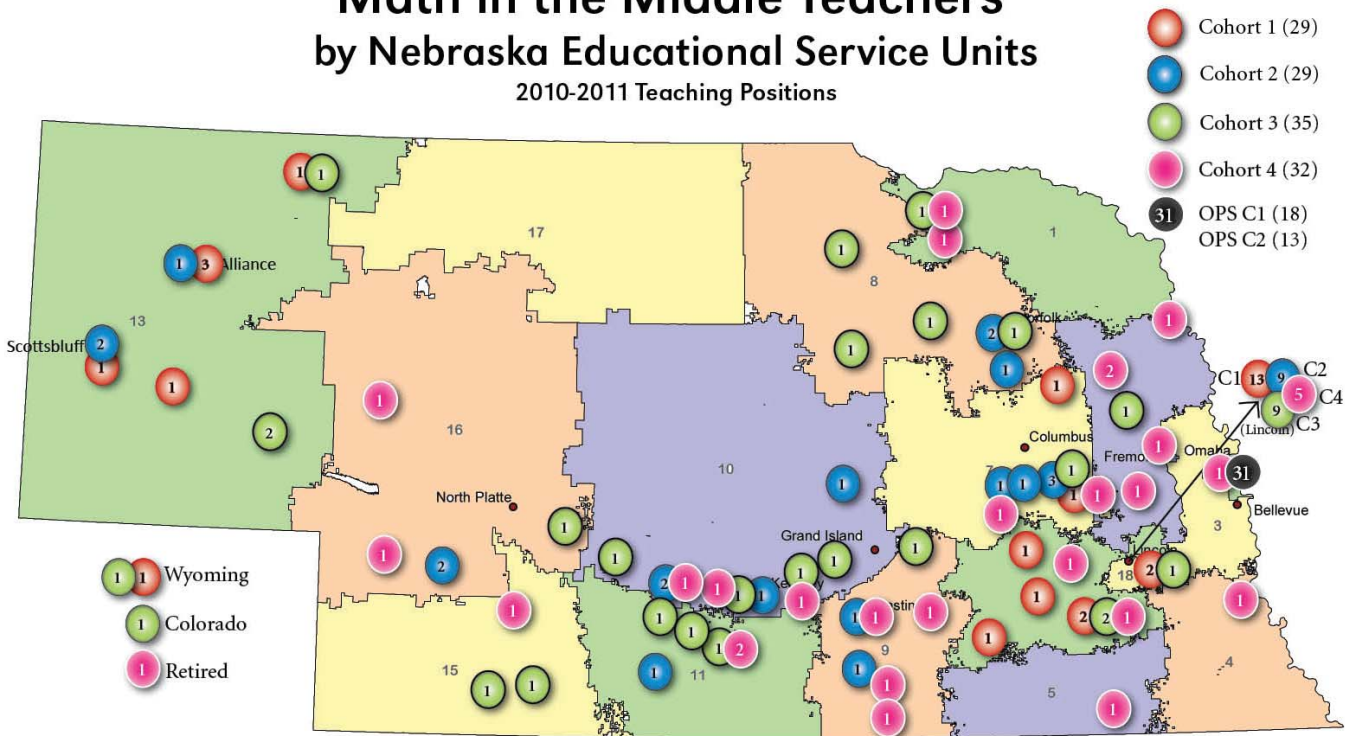
<sup>3</sup> Includes 7 in coaching roles

<sup>4</sup> Includes 1 as a district wide Lead Teacher, 1 now an assistant principal, and 1 now a K-6 math coach

<sup>5</sup> Have moved to districts outside Nebraska

<sup>6</sup> Pursuing doctoral studies at UNL

# Math in the Middle Teachers by Nebraska Educational Service Units 2010-2011 Teaching Positions



In addition to the teachers participating in M<sup>2</sup>, two other in-service teachers assisted with the research and served on instructional teams for courses.

Of the 156 teachers who have graduated or will graduate from the Math in the Middle Institutes, their positions break down as follows (note that elementary schools varied among PK-4, K-4, PK-5, K-5, PK-6 and K-6; middle schools varied among 5-8, 6-8, 7-8, and 7-9; secondary 7-12 schools were found in rural areas):

School Level	# of Participants
Elementary (PK/K-4, 5, or 6)	36
Middle Level (mostly 6-8)	85
Secondary (7-12)	17
High School (9-12)	15
Other <sup>b</sup>	4

<sup>b</sup> Includes two at ESU/district level positions and two participants now at UNL in doctoral programs

The 156 teachers all earned master's degrees from UNL by August 2011 and completed the coursework by taking 12 graduate courses (36 credit hours, see courses on Page 16).



**COHORT 2:** JESSICA FRICKE (LEFT), KAREN SCHUR AND RACHEL FELLOWS WORK ON FUNCTIONS.



**COHORT 3:** JALENA SLACK AND MICKI MCCONNELL (LEFT, FRONT) AND KACY HEISER (STANDING) READ AN ASSIGNMENT.



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“DR. JIM LEWIS AND DR. RUTH HEATON BROUGHT ME FROM A BELOW-AVERAGE TEACHER THAT FELT MY IMPACT ON STUDENTS WAS MINIMAL TO AN OUTSTANDING TEACHER THAT CAN’T WAIT TO START THE NEXT DAY’S LESSON. I EVEN CONSIDER MYSELF A MATHEMATICIAN OF SORTS AND TRY TO INSTILL THAT IN MY STUDENTS. I CAN’T EMPHASIZE ENOUGH HOW GRATEFUL I AM TO MATH IN THE MIDDLE. I AM A NEW AND BETTER TEACHER BECAUSE OF THIS PROGRAM.”

**DANIEL SCHABEN, ARAPAHOE PUBLIC SCHOOL  
MATH IN THE MIDDLE COHORT 2**





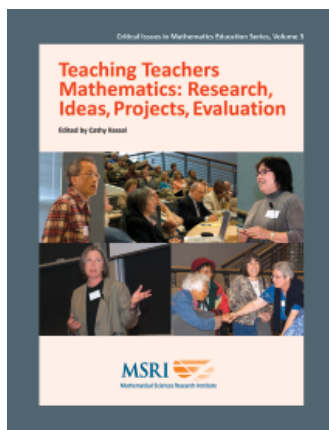
## IMPACT: Research

The M<sup>2</sup> Institute offered content rich courses designed to develop teachers' mathematical knowledge and knowledge of effective classroom pedagogy, thereby positioning them to be leaders among their peers. The M<sup>2</sup> Institute had four main objectives: 1) enhancing mathematical knowledge; 2) enabling teachers to transfer mathematics they have learned into their classrooms; 3) leadership development; and 4) action research.

The M<sup>2</sup> Institute also mounted a research agenda focused on the goal of understanding: 1) whether the M<sup>2</sup> approach to linking content and pedagogy enhances the sophistication of teachers' mathematical thinking and promotes changes in classroom practice; and 2) whether changes in practice lead to improvement in student achievement. In particular, we investigated these research questions:

- **What are the capacities of teachers to translate the mathematical knowledge and habits of mind acquired through the professional development opportunities of M<sup>2</sup> into measurable changes in teaching practice?**

- **To what extent do observable changes in mathematics teaching practice translate into measurable improvement in student performance?**



RUTH HEATON AND JIM LEWIS HELPED ORGANIZE AND LEAD THE MATHEMATICAL SCIENCES RESEARCH INSTITUTE'S WORKSHOP ON TEACHING TEACHERS MATHEMATICS, IN BERKELEY, CALIF., IN MAY 2007. THEIR MATHEMATICIAN-MATHEMATICS EDUCATOR PARTNERSHIP WAS ONE OF SEVERAL HIGHLIGHTED AS BEING A NATIONAL MODEL FOR WORKING PRODUCTIVELY WITH PRE-SERVICE AND IN-SERVICE TEACHERS.

The questions were investigated using multiple qualitative and quantitative research methods and sources of evidence, including pre- and post-participation surveys (administered at the beginning and end of M<sup>2</sup> participation, as well as one year after



## PARN TRAVELS TO JAPAN ON FULBRIGHT

Laura Parn, former math coach for Lincoln Public Schools and Math in the Middle Cohort 1 participant, was selected in October 2008 to participate in the Japan Fulbright Memorial Fund Teacher Program, a Fulbright sponsored by the Japanese government. Parn toured Japanese schools, met government officials and learned about the educational system and culture for three weeks. "My work as a coach was greatly enhanced by my time in Japan," Parn said. "Witnessing educators work so intensely together in Japan to plan challenging content was a model that I strived to exemplify when I collaborated with teachers of various grade levels."

completion of M<sup>2</sup>), individual and focus group interviews, videotaped observations, analysis of student achievement data, and artifact collection and analysis of lesson plans, instructional materials, student work, and other documents.

The qualitative analyses indicated the M<sup>2</sup> Institute does increase teachers' mathematical habits of mind. Some teachers made large measurable changes to their teaching practices while the impact on the teaching of other participants was less obvious, despite gains they made with respect to mathematical and pedagogical knowledge in courses with the instructors.

Until the 2010-2011 academic year, each school district in Nebraska was free to choose the student achievement measure deemed appropriate; a variety of criterion- and norm-referenced tests were administered to various grade levels at various points during the year across districts. The initial data analysis efforts focused on how to analyze the various kinds of achievement data from the largest participating school district. Data were collected from all 326 sixth- to eighth-grade teachers in this district, 35 of whom were M<sup>2</sup> participants. Yet, no existing statistical models

## FACULTY ROLES IN MATH IN THE MIDDLE

A significant number of university and college faculty have been involved in Math in the Middle through many roles including designing the Institute, designing the research study, designing and teaching courses, advising master's degree students, analyzing data, and conducting research. By category, the faculty include:

- 13 UNL MATHEMATICS FACULTY
- 2 UNL STATISTICS FACULTY
- 9 UNL EDUCATION FACULTY
- 8 MATHEMATICIANS FROM OTHER COLLEGES OR UNIVERSITIES



**COHORT 4:**  
BRANDEE  
WILSON  
AND LEXI  
WICHELT  
COLLABO-  
RATE ON A  
MATH  
PROBLEM.

were adequate to address even this one district's assessment practice of administering a mix of norm- and criterion-referenced tests to various grade levels each year.

Traditional methods of regression analyses and hierarchical linear models of student achievement data yielded mainly non-significant differences between students whose teachers participated in Math in the Middle and those whose teachers did not. Thus, we worked closely with statisticians and our evaluation team to develop and test several new statistical methods.

The 2010 dissertation by Jennifer Green, Research Assistant Professor in Statistics and the CSMCE at UNL, focused on modeling this mixture of norm- and criterion-referenced tests. Green adapted Bill Sanders' educational value added assessment system (EVAAS) by converting student achievement test scores to z-scores, and then using those standardized scores to model teacher effects on student achievement. Green continues to work with project data, further refining and applying these models and methods to more complicated data.

Another outgrowth of this data problem encountered in Math in the Middle is the newly awarded Data Connections grant, a Research, Evaluation, and Technical Assistance MSP. Co-PIs of Data Connections include two statisticians, a mathematics educator, and an assessment specialist from a local school district, who have all been working on the problem of how to make sense of the types of student achievement data collected by Math in the Middle.

One of the methods being applied to these data is the concept of binning. Within one large

district, fifth- to eighth-grade student achievement test scores (2004-2009) were standardized, and then the difference in scores across each pair of years were ranked and separated into 10 "bins" (deciles). The average bin number for a class of students thus could be tied to a teacher, with higher bin averages reflecting classes that made greater score gains relative to their peers than teachers whose classes had a lower bin average. We found that teacher bin averages were approximately normally distributed. In this particular district, we also were able to recruit a comparison group of teachers. While the comparison teacher bin average was stable across the time period, we saw small increases in the bin averages for some Math in the Middle participants.

## IMPACT: Doctoral Education

In the spirit of NSF's GK-12 program, the Principal Investigators believed that it was important to involve graduate students in both the project's research program and in the courses being taught. This is an important step in helping educate a generation of doctoral students, and in particular mathematics doctoral students, who go on to academic positions with a valuable experience teaching teachers and a predisposition toward such work as part of their professional career.

Across the seven years of Math in the Middle, 51 graduate students were involved in the project work, mainly serving on instructional teams and assisting with the research. Of those 51, the breakdown includes 37 in mathematics, seven in education, and seven in statistics. Also, out of those 51 graduate students, 25 have earned Ph.D.s

in mathematics and one an M.A., five have earned Ph.D.s in education (one from Northwestern University), and five have earned Ph.D.s in statistics. Most of those who have earned Ph.D.s are in academic or research jobs, many of which include an interest in being involved in issues related to K-12 mathematics education, including three who have helped start Math Teachers' Circles at their new location. Additionally, 10 mathematics, two education, and two statistics doctoral students remain active in pursuing Ph.Ds.

Five doctoral students have completed dissertations based on Math in the Middle research, including Green, with one in progress.

A dissertation by Wendy Smith, Research Assistant Professor with the CSMCE and a NebraskaNOYCE and Data Connections co-PI, contributed to research in mathematics education



WENDY SMITH

through the insights it offered regarding how teachers make use of the various contexts that impact teaching. Her work reveals the complex layers of context and the variety of ways in which teachers use the same contexts in very different ways. Her work also contributes to a deepening understanding of Ball et al.'s construct of mathematical knowledge for teaching, particularly around the use of teacher questions, mathematical representations, and mathematical language in practice.

Yolanda Rolle's dissertation contributes to research in mathematics through its groundbreaking work in articulating "mathematical pedagogical habits of mind," an uncharted territory in research in mathematics education. In her work, Rolle, an Assistant Professor at Boston University, begins to operationalize some of the habits and dispositions that lead to productive mathematical teaching and learning.

David Hartman's dissertation developed two case studies of several  $M^2$  teachers as learners of mathematics, highlighting supports and obstacles to their learning and their capacities to translate their learning into classroom practice. Hartman, a Lincoln Public Schools teacher, found that both teachers embraced collaboration as a tool to learn mathematics. The teachers' habits of mathemati-



MATH IN THE MIDDLE GRADUATE PAULA MILLERD (RIGHT) SPOKE ON THE PANEL "TEACHERS' PERSPECTIVES ON TEACHER EDUCATION" WITH NCTM PRESIDENT MIKE SHAUGHNESSY (LEFT), MATT COLEMAN AND CATIE CARRIGAN AT THE 2011 CBMS FORUM.

## MILLERD SPEAKS AT CBMS FORUM

Math in the Middle Omaha Public Schools Cohort 1 participant Paula Millerd is currently OPS' first building mathematics coach, serving at Field Club Elementary. A former elementary teacher, Millerd became her building's technology teacher and consultant during her time in  $M^2$ .

After  $M^2$ , Millerd was invited to become a Teacher in Residence for Northwestern University, while beginning to pursue doctoral coursework at UNL in mathematics education.

In 2011, Millerd was invited to attend the Conference Board of the Mathematical Sciences (CBMS) fourth National Forum on Oct. 3-4 in Washington, D.C., where she participated on a teacher panel talking about mathematics teacher preparation, and co-presented a talk about the impact of the Math in the Middle, NebraskaMATH and NebraskaNOYCE grants. She is currently one of 23 Noyce Master Teaching Fellows.

Jim Lewis said Millerd did an outstanding job of speaking on behalf of elementary teachers: "Paula was very poised and articulate; she clearly has thought very carefully about what colleges should be doing to prepare teachers to teach mathematics well."

cal learning become evident in practices they deployed while learning mathematics. Both teachers utilized making connections, using representations, and testing cases to learn mathematics. Simultaneously, the teachers' learning looked different from each other: one displayed a persistent nature in solving problems while the other consistently looked for ways to link mathematical learning to teaching. Furthermore, both teachers' written work indicated a deepening understanding of mathematical ideas and a growing ability to communicate mathematics to others.



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## DEVELOPING MATH COACHES



**KRISTIN  
JOHNSON**

### Kristin Johnson and Anne Schmidt, Lincoln

Kristin Johnson and Anne Schmidt both became math coaches for Lincoln Public Schools after their Math in the Middle experience. In 2009, Schmidt became the math instructional coach for Culler Middle School, and in 2011, Johnson became the instructional coach for three high schools, Lincoln East, Southeast and Southwest. "The biggest change is building relationships with new teachers, but it's so good to build those, and I learned how to do that in Math in the Middle. You can't make change until people are ready to see how you can help

and use it," Johnson said. Schmidt added, "I was interested in the role of math coach because of the success I found through collaboration. I truly enjoyed my experiences of collaborating with Kristin regarding the math curriculum, which led to the creation of various assessments that we believed led students to deeper understanding of mathematical concepts. The opportunity to learn from other teachers provides me with incredible energy."



**ANNE SCHMIDT**



**SHANA DICK**

### Shana Dick, Scottsbluff

"My district, Scottsbluff Public Schools, recently hired a secondary curriculum director (our district has operated with one curriculum director), and three content specialists, in math, language arts and science. As the new math specialist, I work with principals, teachers and students to make sure our district is preparing students for the future. I look at data to ensure that we are giving our students the best opportunities possible. The three content specialists work closely together to assist with technology and other resources for teachers to use. Thanks to Math in the Middle, I have a new appreciation for math education. I learned a lot about different ways to teach concepts, and most importantly, I now understand how important communication is when teaching and learning math. I built some great bonds with math teachers across the state, and I have developed a wonderful network of support."

## IMPACT: Teacher Leadership

University faculty and graduate students who are teaching graduate courses for teachers and interacting with them have been the impetus for an important cultural change as well. Teachers, as "Master Teachers," are viewed as important partners with faculty members. To date, 42 Math in the Middle graduates have been hired to work at least once (many several times) as part of an instructional team for one of our Math in the Middle courses or a course for math teachers that is part of one of our other programs, such as the Nebraska Math & Science Summer Institutes (see Page 16). Four teachers have been hired to "co-teach" or be the lead instructor for a course for teachers.

Additionally, teachers took on more leadership roles after their participation in Math in the Middle. Ten Math in the Middle graduates have become instructional coaches in their districts, one graduate has become an ESU-level curriculum consultant, and one has taken a faculty position at a local community college. Many Math in the Middle graduates are department chairs. Graduates include the current and two past presidents of the Nebraska Association of Teachers of Mathematics (NATM), Nebraska's NCTM-affiliate, as well as a majority of the NATM leadership team. A mathematics faculty member from a neighboring university who has instructed Math in the Middle courses also served as president of NATM for one year. Math in the Middle graduates served at the state level on the state mathematics standards revision committee (2008-2009), as well as the state mathematics assessment writing team (2009-2010).

A handful of Math in the Middle graduates are actively involved with the leadership of two area Math Teachers' Circles, which began in 2007 and are expected to continue; a third Math Teachers' Circle is led by a former mathematics doctoral student who was involved on several Math in the Middle instructional teams and now is mathematics professor at the University of Nebraska at Kearney. Many more graduates have been involved in school and district math curricula committees (including textbook selection committees), as well as serving on building assessment teams to help colleagues make sense of achievement data.

Additionally, many Math in the Middle graduates have given presentations and provided professional development to other mathematics teachers across Nebraska.

At the K-12 level, institutional change has been seen in many districts. After LPS began having Math in the Middle graduates, they began to create mathematics coaching positions. The first district math coach, and seven of the nine current math coaches, are Math in the Middle graduates. LPS sees Math in the Middle graduates as teacher leaders, and uses them accordingly to mentor other teachers and to offer building- and district-level professional development (see Kristin Johnson and Anne Schmidt on Page 10).

In OPS, while many elementary buildings have had “instructional facilitators” (whose jobs include some academic coaching mainly in the field of literacy), beginning in Fall 2011, there will be three mathematics coaches at the elementary level. The first elementary coach chosen is a Math in the Middle graduate. Additionally, OPS completely rewrote their district curriculum at the middle level over the last two years, and the entire writing committee (six teachers) were Math in the Middle graduates.

Rural districts also value Math in the Middle graduates and make changes to give graduates positions of leadership. Scottsbluff hired graduate Shana Dick (see Page 10) as a new math content specialist, and ESU 8 hired graduate JaLena Slack as a curriculum specialist.

Twelve M<sup>2</sup> graduates also have begun to pursue doctoral degrees.

## IMPACT: Student Connections

The institutionalization of Math in the Middle is also at the classroom/teacher level. As one participant noted several years after she graduated, “Through Math in the Middle, I have become a much more confident teacher of mathematics. The program allowed me to push myself even in areas I felt uncomfortable. Problem solving has become a normal part of my classroom and something my students start to look forward to.”

Several graduates of Math in the Middle have been given opportunities by their districts to have their elementary buildings move to a more



## BOHAC WINS CHRISTA McAULIFFE AWARD

Math in the Middle Cohort 4 participant Kathy Bohac was the 2011 recipient of the Christa McAuliffe Prize for Courage and Excellence in Education. This prize is awarded annually to a Nebraska teacher who demonstrates excellence and courage in their teaching by making a lasting, positive effect on their students and their peers. Bohac, a fourth- through seventh-grade teacher at East Butler Public Schools, received a \$1,000 stipend and a plaque, presented at a banquet in her honor on March 6, 2011. Her school also received a \$500 award to help support its activities.

Bohac was nominated by Jim Koontz, superintendent of East Butler Public Schools, who commended her for being willing to take on the new challenge of teaching seventh-grade math in spite of her personal circumstances - Bohac's husband died of lung cancer in 2008, and her brother died in a fire in 2010.

“I just can't be grateful enough for my M<sup>2</sup> experience. Being an elementary teacher for so long, I never would have considered teaching seventh-grade math before. Now, because of M<sup>2</sup>, I am teaching fourth, fifth, sixth and two sections of seventh grade math,” Bohac said. “I now look at math so analytically. When my students are working on math problems, I am so much more interested in their process of attaining solutions. M<sup>2</sup> has put ‘fun’ instead of ‘fear’ into math for me and now for my students as well. This is thanks to Dr. Jim Lewis, Dr. Ruth Heaton, Dr. Wendy Smith, Dr. David Hartman and the rest of the instructors of the program. I don't believe they will ever realize the profound effect they have had on me.”

“We think Christa McAuliffe would agree that she is a great representative of courage and excellence in education,” said Gregg Wright, founder of the prize.

- Lindsay Augustyn and Ellen Hirst



**OPS COHORT 2 (TOP PHOTO):** OMAHA PUBLIC SCHOOLS TEACHERS MATTHEW TIMM (LEFT) AND KESHA KING COMPLETE AN ASSIGNMENT IN MATH 806T IN JUNE 2010.

**OPS COHORT 1:** OMAHA PUBLIC SCHOOLS TEACHER PATRICK DERR ASSISTS STUDENTS IN HIS FIFTH-GRADE CLASSROOM IN AUGUST 2010.

departmentalized structure, with the Math in the Middle graduates then teaching additional math courses to more students. One sixth grade teacher has become the middle level department chair (see Edie Ronhovde on Page 15).

While we focused on middle level teachers, as mentioned, many rural middle school teachers are at secondary schools, and teach grades 7-12 with high school certification. One of them wrote:

“I hate to admit this, but before Math in the Middle I did not have strong mathematical content knowledge, and had only been in a couple of mathematics courses that modeled reasoning and sense making. I saw math as a set of procedures that I must develop and a mathematician as someone who was good at developing these procedures. I had almost no conceptual understanding of mathematics. My teaching as a consequence did nothing to address reasoning and sense making. I think back to those days and a shiver runs up my spine as I think back to each separate procedure I taught after first looking at the example in the book. After Math in the Middle I can see that my capacity to connect content for students has improved and my confidence in the mathematics has improved. My new vision

of mathematics teaching is to constantly improve my pedagogy to work to engage all students in reasoning and sense making.”

At the IHE level, Math in the Middle has also found some institutionalization at the University of Nebraska at Omaha. A number of UNO faculty taught Math in the Middle courses, both to Math in the Middle cohorts, and for the Nebraska Math & Science Summer Institutes. Additionally, when UNO needed to find an adjunct faculty member to teach Mathematics for the Elementary Educator, they recruited Math in the Middle graduate and OPS teacher Jessica Korth to serve this role.

“I truly feel this opportunity would not have been possible without my work through Math in the Middle,” said Korth, a teacher at Bryan Middle School. “I am extremely honored and am looking forward to the new journey.”

Many lessons have been learned from Math in the Middle. As Math in the Middle has evolved into part of the larger NebraskaMATH partnership, Nebraska teachers, education leaders and public policy leaders continue to work together with the common goal of making Nebraska a national leader with respect to K-12 mathematics education.

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“THE MATH IN THE MIDDLE PROGRAM WAS NOT ONLY ONE OF THE MOST CHALLENGING EXPERIENCES, BUT ALSO THE MOST REWARDING. WITH MY DEGREE, I NOW WORK FOR A MATH PROFESSIONAL DEVELOPMENT PROGRAM AND TEACH COLLEGE CLASSES. AS I TRAVEL ACROSS THE STATE, I COME IN CONTACT WITH OTHER GREAT TEACHERS WHO REALLY CARE ABOUT THEIR STUDENTS AND THEIR LEARNING.”



**JALENA SLACK, EDUCATIONAL SERVICE UNIT 8  
MATH IN THE MIDDLE COHORT 3**



# MATH IN THE MIDDLE'S ACCOMPLISHMENTS AT A GLANCE

- Within the University of Nebraska–Lincoln, there is an appreciation of the university's responsibility with respect to leading a K-12/university partnership that supports continual improvement in K-12 mathematics education and a strong group of scholars who work across department lines to support the partnership. The university also provides a resource base, including Math and Science Teachers for the 21st Century Program of Excellence funds, that supports the work.

- In December 2009, the Center for Science, Mathematics & Computer Education (CSMCE) hosted the Nebraska Summit on



GOVERNOR DAVE HEINEMAN SPEAKS AT THE NEBRASKA SUMMIT ON MATHEMATICS EDUCATION IN DECEMBER 2009, HOSTED BY THE CSMCE.

Mathematics Education, attracting approximately 250 participants to discuss issues in K-12 mathematics education facing the state.

Speakers included Nebraska Governor Dave Heineman; Roger Breed, state superintendent of schools; and J.B. Milliken,

the president of the University of Nebraska System.

- In Fall 2004 and 2006, the CSMCE hosted Rural Education Workshops, to which we invited nationally-recognized rural education experts, as well as Nebraska teachers and administrators. The workshops brought together large numbers of people and included a needs assessment completed by various stakeholders.

- Two Robert Noyce supplements have opened doors at the Omaha Public Schools and have leveraged their participation in both the NebraskaMATH and NebraskaNOYCE grants.

- Twelve M<sup>2</sup> graduates are now NebraskaNOYCE NSF Master Teaching Fellows.

- Graduate coursework has been created to meet the needs of middle level mathematics teachers and two paths to a master's degree have been established: a Master of Arts through Teaching, Learning and Teacher Education and a Master of Arts for Teachers with a Specialization in the Teaching of Middle Level Mathematics through the Department of Mathematics.

- The Math in the Middle Institute and its curriculum have had a significant impact on the development of other graduate programs (e.g. the Master of Arts with an emphasis in elementary teaching) and the curriculum offered by those programs.

- 156 Nebraska mathematics teachers earned a master's

degree through the M<sup>2</sup> Institute.

- As an outgrowth of the M<sup>2</sup> Institute, the Nebraska Math & Science Summer Institutes (see Page 16) offer graduate education for math (and science) teachers across the state.

- Detailed descriptions and course materials of the M<sup>2</sup> courses are posted online for use by scholars at other institutions.

- Evidence of the achievement of M<sup>2</sup> graduates is available on our website in the form of their action research papers and expository mathematics papers.

- Five doctoral students have completed dissertations based on Math in the Middle research, with one in progress.

- 32 faculty and 51 graduate students have served on M<sup>2</sup> instructional teams and conducted associated research.

- 42 teachers who have earned their master's degrees as part of Math in the Middle have later worked as a master teacher as part of the instructional team for a course for teachers.

- Seven published research articles have come out of M<sup>2</sup>, with two more articles forthcoming, two under review, and seven in preparation. Additionally, two book chapters have been written based on Math in the Middle research.

- 76 local, 69 national, and three international presentations have been given about some aspect of M<sup>2</sup> work. Presentations have been given by PIs, other faculty, graduate students, undergraduate researchers, and teacher participants.

- The Knowledge Management and Dissemination Math Science Partnership Project (MSP-KMD) held a conference in May 2010 and featured six high quality MSPs, of which Math in the Middle was one. PIs Lewis and Heaton gave several presentations about different facets of Math in the Middle at this conference, titled "Designing High Quality Professional Development for Teachers of Mathematics and Science." For more, visit: [http://www.mspskmd.net/papers/hqpd\\_conf\\_may2010/](http://www.mspskmd.net/papers/hqpd_conf_may2010/)

- In August 2010, the MSP-KMD produced four cases and a cross-case analysis highlighting the decisions of MSP project leaders that contributed to the sustainability of their teacher-leader programs. M<sup>2</sup> was chosen as one of the four cases, titled "Preparing Teachers for Formal and Informal Leadership Roles: The Case of Nebraska's Math in the Middle MSP." For more, visit: <http://www.mspskmd.net/cases/tl.php>.

- From 2009-12, Ruth Heaton served as the secretary/treasurer for the Rural Education Special Interest Group of the American Education Research Association, an opportunity that came about due to Math in the Middle.

# MATH IN THE MIDDLE TEACHER EXPERIENCES



**ANNA  
ANDERSON**

## Anna Anderson, Holdrege

"I was accepted to Math in the Middle Cohort 3 while I was teaching fifth and sixth-grade math at a Class I school. Our school had about 70 students while the Nebraska Legislature was working on a bill to consolidate all Class I schools. As our district was reorganizing, I was in danger of losing my job or being

moved to another classroom. I have an elementary endorsement, but earned a master's degree in mathematics at UNL through the Math in the Middle program. My school district, Holdrege Public Schools, recognized my master's degree in mathematics, and moved me to the middle school to teach eighth grade math. I know that I would not have this position had I not participated in Math in the Middle. I am thankful for the math education I received, the teaching practices on which I have improved, the relationships with other teachers, and my current position as an eighth grade math teacher."



**EDIE RONHOVDE**

## Edie Ronhovde, Fremont

"My math background previous to teaching sixth grade in the middle school, as opposed to in the grade school, was very limited. I enjoyed math and when the Fremont Public Schools administration asked me which discipline that I would prefer to teach

when we departmentalized, I chose math. After teaching math for a few years, I felt that I needed more training to do justice to my students. I applied for Math in the Middle Cohort 4 and was accepted. What I gained in self confidence and willingness to take chances was even more important than the math I learned. When the department chair position in the middle school was made available I applied for it. Had I not been in the Math in the Middle program, I would have never felt confident enough to apply. This year, each departmental meeting has a theme, and the teachers are all participating in tasks that will help them to be better teachers. We help one another with ideas and teaching methods. In the summer of 2011 I was fortunate enough to become part of the Noyce Master Teaching Fellowship program, and I have already put many of the new ideas that I have gained from these classes to use in my classroom. I am forever thankful to the University of Nebraska-Lincoln and Math in the Middle."



**CRYSTAL  
SIMPSON**

## Crystal Simpson, Omaha

"As an assistant principal at OPS' Standing Bear Elementary, my position has allowed me to promote my love for math. I have been modeling math lessons in classrooms and showing students websites. Reading has been such a focus at my school, but now with the state assess-

ment in math, everyone is realizing math is important too. I started a robotics club for the third- and fourth-graders, and I had 80 applicants - after taking just 10 minutes to talk to each classroom about it. There are 12 students in the club, and we meet every week for an hour. After we get better at driving our robots, we will take them to each classroom to show them off. Now, I would like to start a math club. Math in the Middle helped me to realize what elementary students need to know in order to prepare them for middle school math since I could sit down and talk with middle school teachers for the first time."



**DIANNE LEE**

## Dianne Lee, Omaha

"When I started Math in the Middle OPS Cohort 2, I was my school's Instructional Facilitator. This position provided me opportunities to work with the faculty in my building to implement new teaching strategies. The knowledge of how

important the foundation each grade level builds for the next, and the importance the role of the teacher has in this development, made me yearn to be back working daily with students. My transition back to first grade has been incredibly exciting. The opportunities I have as a teacher of first grade to apply what I learned in Math in the Middle are great. You might think, how is it possible to apply middle level mathematics to what is learned in mathematics that first year of school? Understanding the essential foundation that number sense plays in understanding how all of mathematical thinking is developed is critical. I taught mathematics for many years, but what I didn't do was bring mathematical experiences to my students, so that they could become thinkers and doers of mathematics. My Math in the Middle experience helped me to find the richness in all the concepts that I teach. My first graders are stronger mathematically as a result of my ability to apply what I have learned."

# MATH IN THE MIDDLE CONTINUES THROUGH NMSSI

Math in the Middle courses are still being offered to teachers through the Nebraska Math & Science Summer Institutes (NMSSI), a program providing teachers opportunities to strengthen their disciplinary and pedagogical knowledge while earning graduate credit.

To support the institutionalization of a graduate program that meets the needs of math and science teachers, the university's administration has made a significant commitment to offer courses at discounted tuition rates. The courses are also scheduled in a concentrated delivery format of one or two weeks. This approach both reduces the cost of graduate education and protects teachers' time in the summer for other pursuits. The NMSSI program represents clear evidence that UNL has made a long-term commitment to providing challenging graduate education for Nebraska math teachers and is finding ways to fund those courses.

To support the NMSSI, Nebraska math and science teachers receive discounted tuition to take an NMSSI course (they pay 80 percent of in-state graduate tuition). The NMSSI program is now in its fifth year (2012 courses at: <http://scimath.unl.edu/nmssi>). In 2011, 17 classes for math teachers were offered at eight locations in Nebraska, none of which were supported by NSF funds.

In addition to offering courses in Lincoln in 2011, five courses



UNL 2012 MATHEMATICS DEPARTMENT CHAIR JUDY WALKER (STANDING) TEACHES MATH 806T IN SUMMER 2011 THROUGH THE NMSSI.

were offered in the Omaha metropolitan area and individual courses were offered in facilities provided by six of our rural ESU partners. Of the courses that were taught, 10 were courses

developed by Math in the Middle. There were approximately 210 NMSSI course registrations this summer with courses being taken by 160 different teachers.

Even with the tuition discount, Nebraska teachers have a limited capacity to pay the cost of graduate tuition and fees. Funds at the University of Nebraska Foundation have been utilized to help with these costs, and State Farm donated \$20,000 to support additional tuition fellowships.

## Math in the Middle Courses

for Middle-Level Teachers

**MATH 800T:** Mathematics as a Second Language\*

**MATH 802T:** Functions, Algebra & Geometry\*

**MATH 804T:** Experimentation, Conjecture & Reasoning\*

**MATH 805T:** Discrete Mathematics\*

**MATH 806T:** Number Theory & Cryptology\*

**MATH 807T:** Using Math to Understand Our World

**MATH 808T:** Concepts of Calculus\*

**STAT 892:** Statistics\*

**TEAC 800:** Inquiry into Teaching & Learning\*

**TEAC 801:** Curriculum Inquiry\*

**TEAC 888:** Teacher as Scholarly Practitioner

**Capstone:** Integrating the Teaching & Learning of Math

\* Has been offered in NMSSI



For further information and course descriptions, visit: <http://scimath.unl.edu/MIM/coursematerials.php>

## VERMONT MATHEMATICS INITIATIVE

Ken Gross, from the University of Vermont, is PI for the Vermont Mathematics Initiative, upon which parts of Math in the Middle were based. Dr. Gross's course from the Vermont Mathematics Initiative, "Mathematics as a Second Language," became a foundational course for Math in the Middle participants. Dr. Gross came to Lincoln four times to teach this course to M<sup>2</sup> cohorts. <http://www.cems.uvm.edu/~gross/>

The first three middle level math teachers to earn their master's degree primarily by taking "Math in the Middle classes" through the NMSSI graduated in Summer 2010. In May of 2011, two more math teachers earned their master's degrees primarily by taking NMSSI classes, with four more in August 2011 and two in December 2011. More than 40 Nebraska teachers are now motivated to earn a master's degree because the NMSSI program exists.

To encourage faculty at other universities to consider offering graduate courses for teachers, the Math in the Middle website contains most of the course materials an instructor would need to replicate the Math in the Middle courses, including syllabus, instructor notes, assignments, and problem sets: <http://scimath.unl.edu/MIM/coursematerials.php>. The materials are available for free, but feedback about the experience with the materials is strongly requested.

# MATH IN THE MIDDLE RESEARCH PROJECTS

**ACTION RESEARCH:** <http://scimath.unl.edu/MIM/ar.php>

## **Using Cooperative Learning to Promote a Problem-Solving Classroom**, by Amy Nebesniak

**ABSTRACT:** In this action research study of my eighth grade mathematics classroom, I investigate the benefits of cooperative learning, the support structures needed to promote a cooperative learning environment, and students' ability to transfer the cooperative learning skills into less structured problem solving situations. The data analysis reveals that cooperative learning increases students' confidence levels as well as their involvement in the learning process. In order to create successful teams, students require my providing support structures and modifying the support for each group of students. Finally, students are able to more effectively apply their cooperative skills in concrete situations as compared to problems that require more abstract thinking. The transfer of cooperative learning skills depends on the ability level of the students, teacher support, and exposure to problem solving situations.

(Note: NCTM published the article "Student Confidence and Student Involvement" by Nebesniak and Ruth Heaton, based on this action research project, in the September 2010 issue of "Mathematics Teaching in the Middle School." Purchase it at: <http://www.nctm.org/publications/article.aspx?id=26461>.)

**MATH EXPOSITORY:** <http://scimath.unl.edu/MIM/mat.php>

## **The Five Card Trick**, by Mary Beth Kilnoski

**SUMMARY:** The Five Card Trick is a well-known "magic" trick that is credited to mathematician William Fitch Cheney Jr. (1894-1974). In the Five Card Trick, the magician can name a card drawn randomly from a standard deck of cards. In this trick, a member of the audience selects five cards at random, an assistant selects one of the cards to be turned face down and lays the remaining four cards face up in a line on the table. Then, the magician, who has been out of the room and therefore has not observed any of the assistant's actions, would survey the four cards on the table and name the hidden card. In this trick, since four additional cards are shown to the magician, the chance of naming the hidden card correctly is 1 in 48, or approximately 2 percent. With that probability, there would be no magic trick... unless the magician and the assistant are mathematicians! What do the magician and the assistant know in order to make this trick work?

(Note: In Fall 2010, Dr. William F. Cheney, the son of the late "Fitch the Magician," found Kilnoski's paper online on the M<sup>2</sup> website and told Kilnoski's thesis advisor that he "found it to be the clearest explanation that I've seen on the subject. Please let Mary Beth know that I enjoyed her paper!")

## COMMON CORE IMPLEMENTATION EXPLORED AT ESMP CONFERENCE HONORING LEWIS

The Enacting Standards for Mathematical Practices Conference on Oct. 21-22, 2011, brought together research mathematicians, mathematics teacher educators, researchers, classroom teachers and school administrators to discuss a nationwide problem in mathematics education: how to implement the Standards for Mathematical Practice found in Common Core State Standards for K-12 math classrooms in meaningful, high-quality ways. The message of the plenary speakers is that this will be an incredibly difficult task, but well worth the effort.

The success of the Common Core State Standards (CCSS) for Mathematics likely hinges on the degree to which the Standards for Mathematical Practices are implemented by teachers PreK-20. Such implementation will require a great deal of support, and require the development of a new professional culture of educators, in which teaching knowledge is publicly shared and highly valued.

While Nebraska has not yet adopted the Common Core State Standards, it may be wise for Nebraska teachers to think hard about how to integrate the Standards for Mathematical Practice into their teaching now and for the state to consider adopting the CCSS in the

very near future. Otherwise, we are at risk of finding our students lagging behind the nation in mathematics achievement and in receiving federal support linked to mathematics education.

A number of Nebraska teachers shared in breakout sessions the things they do to enact the Standards for Mathematical Practices: having students work on non-routine problems and communicate their reasoning to peers; working as mathematical coaches to help teachers learn how to better integrate problem solving in their daily lessons; and focusing on helping students learn the habits of mind of mathematical thinkers.

M<sup>2</sup> graduates Kathy Bohac, Connie Colton, Doug Glasshoff, Julie Kreizel, Laura Parn and Anne Schmidt all presented.

A banquet honoring Jim Lewis closed the conference. Ruth Heaton and Paula Millerd were two of the many speakers to give a tribute to Lewis, who has dedicated much of his 40-year career to improving math education from kindergarten through college, for women and minorities, in rural and urban schools.

See <http://scimath.unl.edu/conferences> for more about the ESMP Conference, including presentation slides and videos.



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# MATH IN THE MIDDLE GRADUATES

## **2011 Teaching Positions** **(Nebraska unless otherwise noted)**

### **Cohort 1**

**Julane Amen**, Lincoln Public Schools, McPhee Elementary  
**Delise Andrews**, Lincoln Public Schools, District Math Coach  
**Darla Berks**, Lincoln Public Schools, Coach for Lincoln High  
**Myrna Bornemeier**, Lincoln Public Schools, Lux Middle School  
**Virginia Clark**, Waverly School District 145, Waverly Middle School  
**Michael Cobelens**, Waverly School District 145, Waverly Middle School  
**Dean Davis**, Centennial Public Schools  
**Bryan Engelker**, Goshen County School District No. 1, Torrington, Wyo., Torrington Middle School  
**Diana French**, Alliance Public Schools, Alliance Middle School  
**Gary Furse**, Lincoln Public Schools, Pound Middle School  
**Doug Glasshoff**, East Butler Public Schools  
**Shauna Green**, Lincoln Public Schools, Irving Middle School  
**Karen Hillen**, Leigh Community Schools  
**Natalie Jenkins**, Gering Public Schools, Gering Junior High  
**Kristin Johnson**, Lincoln Public Schools, Lincoln Southwest, Lincoln East and Lincoln Southeast High School Coach  
**Michelle Keszler**, Bridgeport Public Schools  
**Julie Kreizel**, Lincoln Public Schools, District Math Coach  
**Stacie Lefler**, Gordon-Rushville K-8 Schools, Gordon-Rushville Middle School  
**Tiffany Lothrop**, Crete Public Schools, Crete Middle School  
**Shawn Mousel**, Lincoln Public Schools, Pound Middle School  
**Laura Parn**, Foristell, Mo., Peine Ridge Elementary School  
**Jim Pfeiffer**, Friend Public Schools, Friend Public Schools  
**Kyle Poore**, Crete Public Schools, Crete Middle School  
**Janet Schlattmann**, Alliance Public Schools, Alliance Middle School  
**Anne Schmidt**, Lincoln Public Schools, Culler Middle School  
**Sandi Snyder**, Shickley Public Schools  
**Vicki Sorensen**, Lincoln Public Schools, Culler Middle School  
**Danielle Swanson**, Alliance Public Schools, Alliance Middle School  
**Lindsey Thompson**, Lincoln Public Schools, Mickle Middle School

### **Cohort 2**

**Stacey Aldag**, Northeast Community College (formerly Battle Creek Public Schools, Battle Creek High School)  
**Carol Brown**, Alliance Public Schools, Alliance Middle School  
**Tricia Buchanan**, St. Paul Public Schools, St. Paul High School  
**Kathy DeLashmatt**, Hastings Public Schools, Abraham Lincoln Elementary  
**Shana Dick**, Scottsbluff Public Schools, Curriculum Coordinator  
**Gary Eisenhauer**, Battle Creek Public Schools, Battle Creek High School  
**Rachel Fellows**, Lincoln Public Schools, Fredstrom Elementary  
**Jessica Fricke**, Lincoln Public Schools, Irving Middle School  
**Tom Harrington**, Madison Public Schools

**Lisa Henjes**, Lincoln Public Schools, Lux Middle School  
**Megan Abresch**, Wallace Public School, Wallace Elementary  
**Chad Larson**, Scottsbluff Public Schools, Bluffs Middle School  
**Rachelle Mayo**, David City Public Schools, David City Elementary  
**Carmen Melliger**, Aquinas St Mary's Catholic Schools, Aquinas Middle/High School  
**Linda Moore**, Lexington Public Schools, Lexington High School  
**Amy Nebesniak**, Lincoln Public Schools, Coach for Lincoln North Star High School  
**Jeremy Renfro**, Lincoln Public Schools, Goodrich Middle School  
**Dan Schaben**, Arapahoe Public Schools, Arapahoe High School  
**Karen Schur**, Lincoln Public Schools, Sheridan Elementary  
**Josh Severin**, Lincoln Public Schools, Lincoln Southeast High School  
**Christy Sheets**, Wallace Public Schools District 65 R, Wallace High School  
**Dot Snesrud**, Osceola Public Schools, Osceola Elementary  
**Cindy Steinkruger**, Blue Hill Public Schools, Blue Hill Elementary  
**Diane Swartzlander**, Lincoln Public Schools, Schoo Middle School  
**Tina Thompson**, Lexington Public Schools, Lexington Middle School  
**Janet Timoney**, Aquinas St Mary's Catholic Schools, Aquinas Middle/High School  
**Greg Vanderbeek**, Kearney Public Schools, Sunrise Middle School  
**Andrea Wiens**, Lincoln Public Schools, Lux Middle School  
**Lori Ziemba**, Shelby Public Schools, Shelby Elementary

### **Cohort 3**

**Val Adams**, Lincoln Public Schools, Schoo Middle School  
**Anna Anderson**, Holdrege Public Schools, Holdrege Middle School  
**Vicki Barry**, Lincoln Public Schools, Goodrich Middle School  
**Deb Borgelt**, Norfolk Public Schools, Norfolk Junior High School  
**Joan Brethouwer**, Crete Public Schools, Crete Middle School  
**Sandy Dean**, Elwood Public Schools, Elwood High School  
**Scott Eckman**, Lincoln Public Schools, Park Middle School  
**Jill Edgren**, Wood River Rural Jr/Sr High, Wood River Rural High School  
**Monte Else**, Fremont County School District 1, Lander, Wyo., Lander Valley High School  
**Alisa Favinger**, Cozad City Schools, Cozad High School  
**Kelly Georgius**, University of Nebraska-Lincoln  
**Kyla Hall**, Lincoln Public Schools, Rousseau Elementary  
**Kacy Heiser**, Gordon-Rushville K-8 Schools, Gordon-Rushville Middle School  
**Cole Hilker**, O'Neill Public Schools  
**Kim Cotton**, Garden County Schools, Garden County Junior High School  
**Julie Hoaglund**, Brady Public Schools, Brady High School  
**Emy Jones**, Nebraska Unified District 1, Verdigre High School

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# MATH IN THE MIDDLE GRADUATES

**Jill Kranda**, Aquinas St Mary's Catholic Schools, St. Mary's Elementary

**Emily Lashley**, Southwest Public Schools, Southwest High School-Indianola

**Micki McConnell**, Garden County Schools, Garden County Junior High School

**Katie Pease**, Lincoln Public Schools, Goodrich Middle School

**Brad Piper**, Lincoln Public Schools, Belmont Elementary

**Shelley Poore**, Crete Public Schools, Crete Elementary

**Amy Schutz**, Bertrand Public Schools, Bertrand Community School

**Tara Schwanebeck**, Kearney Public Schools, Sunrise Middle School

**Bryce Schwanke**, Lincoln Public Schools, Lakeview Elementary

**Toni Scusa**, Yuma School District, Colo., Yuma Middle School

**Shelly Sehnert**, McCook Public Schools, McCook High School

**JaLena Slack**, ESU 8, Project Coordinator NMPDS

**Marcia Smith**, Wheeler Central Schools, Wheeler Central High

**Amanda Stark**, Gibbon Public Schools, Gibbon High School

**Cara Walz**, Lincoln Public Schools, Irving Middle School

**Aubrey Weitzenkamp**, Scribner-Snyder Community Schools, Scribner-Snyder Secondary School

**Leah Wilcox**, Waverly School District 145, Waverly Middle School

**Amy Wilson**, Aurora Public Schools, Aurora Elementary

## Cohort 4

**Teena Andersen**, West Point Schools, West Point Elementary

**Ali Arndt**, Lincoln Public Schools, Lux Middle School

**Katherine Bohac**, East Butler Public Schools

**Michael Bomar**, Wahoo Public Schools, Wahoo Middle School

**Mary Alice Carlson**, University of Nebraska-Lincoln

**Mindy Fichtner**, Gibbon Public Schools, Gibbon Elementary

**Michael Ford**, Elm Creek Public Schools, Elm Creek Public Schools

**Jeremy Fries**, Crete Public Schools, Crete High School

**Stephanie Fuehrer**, Holdrege Public Schools, Holdrege Middle School

**Michaela Goracke**, Harvard Public Schools

**Marlene Grayer**, Omaha Public Schools, Alice Buffett Magnet Middle School

**Marilyn Hein**, Diller-Odell Public Schools, Diller-Odell Jr./Sr. High School

**Shayne Hite**, Perkins County Schools, Perkins County Elementary

**Scott Johnsen**, Medicine Valley School District, Medicine Valley Jr./Sr. High School

**Brian Johnson**, Nebraska City Public Schools, Nebraska City Middle School

**Gretchen Long**, Umo N ho N Nation Public Schools

**Michelle Looky**, Lincoln Public Schools, Culler Middle School

**Corie Lubash**, Lincoln Public Schools, Park Middle School

**Sheila McCartney**, South Central Nebraska Unified District #5, Lawrence/Nelson Jr.-Sr. High School

**Ryon Nilson**, Creighton Community Schools

**Marci Ostmeyer**, Cross County Community Schools, Cross County Middle School

**Maggie Pickering**, Lincoln Public Schools, Irving Middle School

**Lori Pierce**, Nebraska Unified District 1, Verdigre Attendance Center

**Edie Ronhovde**, Fremont Public Schools, Fremont Middle School

**Lindsey Sample**, Milford Public Schools, Milford Elementary

**Mary Schneider**, Holdrege Public Schools, Holdrege Middle School

**Cathy Jo Schultz**, West Point Schools, West Point Elementary

**Amy Solomon**, Lexington Public Schools, Lexington Middle School

**Geri Steinbrink**, Arapahoe Public Schools, retired

**Jessica Thompson**, Superior Public Schools, Superior Jr/Sr High School

**Lexi Wichelt**, Hastings Public Schools, Hastings Middle School

**Brandee Wilson**, Arthur County Schools, Arthur Elementary

## Omaha Public Schools Cohort 1

**Tanya Archie**, Benson High School

**Pamela Arvie**, Prairie Wind Elementary

**Amy Bystrom**, Pawnee Elementary

**Connie Colton**, McMillan Magnet Center

**Patrick Derr**, Springville Elementary

**Jonelle Dickmeyer**, Pinewood Elementary

**Jodie Emerson**, Morton Magnet Middle School

**Patty Hastings**, Western Hills University Part Magnet

**Mary Beth Kilnoski**, Marrs Magnet Middle School

**Jessica Korth**, Bryan Middle School

**Philip LaFleur**, Monroe Middle School

**Jocelyn Masasi**, Marrs Magnet Middle School

**Paula Millerd**, Field Club Elementary

**Loretta Ohnemus**, Burke High School

**Valerie Schovanec**, OPS District Office

**Crystal Simpson**, Standing Bear Elementary, Assistant Principal

**Lisa Vavra**, Alice Buffett Magnet Middle School

**Keri Witherell**, Lewis and Clark Middle School

## Omaha Public Schools Cohort 2

**Jay Beyer**, WaKonda Elementary

**Katie Glacey**, Sherman Elementary

**Amy Gordon**, Nathan Hale Middle School

**Kesha King**, Chandler View Elementary

**Brian Kohlhaas**, Monroe Middle School

**Kelly LaFleur**, Lewis and Clark Middle School

**Sarah Larson**, Alice Buffett Magnet Middle School

**Susan Leavitt**, Skinner Magnet Center

**Dianne Lee**, Sherman Elementary

**Joseph Nuss**, Bancroft Elementary

**Jennie Premer**, McMillan Magnet Center

**Matthew Timm**, Belvedere Academy

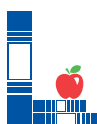
**Lynn West**, Marrs Magnet Middle School

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