

**UNITED STATES DEPARTMENT OF EDUCATION
NATIONAL MATHEMATICS ADVISORY PANEL MEETING**

September 6, 2007

SUMMARY

The National Mathematics Advisory Panel met in open session at the Eric P. Newman Education Center, 320 South Euclid Avenue, St. Louis, Missouri, 63110, on Thursday, September 6, 2007, at 3:30 p.m.

PANEL AND EX OFFICIO MEMBERS PRESENT:

DR. LARRY FAULKNER,	Chair
DR. CAMILLA BENBOW	Vice Chair
DR. DEBORAH LOEWENBERG BALL	Member
DR. SUSAN EMBRETSON	Member
DR. FRANCIS (SKIP) FENNELL	Member
DR. BERT FRISTEDT	Member
DR. DAVID GEARY	Member
DR. RUSSELL GERSTEN	Member
DR. TOM LOVELESS	Member
DR. LIPING MA	Member
DR. VALERIE REYNA	Member
DR. ROBERT SIEGLER	Member
DR. SANDRA STOTSKY	Member
MR. VERN WILLIAMS	Member
DR. HUNG-HSI WU	Member
DR. IRMA ARISPE	Ex Officio
DR. DANIEL B. BERCH	Ex Officio
DR. JOAN FERRINI-MUNDY	Ex Officio
MR. RAYMOND SIMON	Ex Officio
DR. GROVER (RUSS) WHITEHURST	Ex Officio

PANEL AND EX OFFICIO MEMBERS NOT PRESENT:

DR. A. WADE BOYKIN	Member
DR. DOUGLAS CLEMENTS	Member
DR. WILFRIED SCHMID	Member
DR. JAMES SIMONS	Member

STAFF MEMBERS PRESENT:

MS. TYRRELL FLAWN, EXECUTIVE DIRECTOR
MS. MARIAN BANFIELD
MS. IDA EBLINGER KELLEY
MS. JENNIFER GRABAN
MR. JIM YUN
MR. KYLE ALBERT

CALL TO ORDER:

Chair Faulkner welcomed everyone to the opening session of the National Mathematics Advisory Panel at Washington University in St. Louis. He thanked the University for hosting the eighth National Math Panel Meeting. He stated that it is fitting for the Panel to be meeting at Washington University, which is a top recipient of federal, industrial and foundation research support for its programs in medicine, science, engineering and social science. Washington University School of Medicine, founded in 1891, is ranked by *U.S. News and World Report* as one of the top five in the nation and its students are ranked first in terms of academic quality.

Chair Faulkner asked if there were members of the audience who needed signing services. There were not.

Chair Faulkner then introduced Dr. Mark Wrighton, the fourteenth chancellor of Washington University in St. Louis, who has served in this position since 1995. He is a renowned chemist, with his Bachelor's Degree from Florida State and a Ph.D. from Cal Tech. Dr. Wrighton started his career at MIT as an assistant professor in 1973 and, over twenty-three years, achieved increased levels of academic recognition in leadership at MIT. He held chairs in chemistry and then served as provost from 1990 to 1995.

Dr. Wrighton is responsible for a two-fold increase in undergraduate applications; 165 new endowed professorships for faculty; a newly created program in biomedical engineering; completion of 30 buildings; and the successful completion of a 1.55 billion dollar campaign for student scholarship, professorships, other endowed program support and new facilities.

DR. MARK WRIGHTON, CHANCELLOR, WASHINGTON UNIVERSITY, ST. LOUIS

Dr. Wrighton thanked Chair Faulkner for the generous words and welcomed him to Washington University. He stated that the work of the National Math Panel is extremely important and that it is rewarding to see so many talented and important people spending time on this important endeavor. He expressed his gratitude on behalf of many in higher education for the work that members of the Panel are doing and especially Larry Faulkner, for taking on the important role of Chair.

Dr. Wrighton recently had the opportunity to meet U.S. Secretary of Education Margaret Spellings when he was invited to be part of a delegation of college and university presidents to travel to Latin America. He came away with a strong conviction that Secretary Spellings is very effective and committed to advancing education in our country, which we all recognize as so vital to our success.

He stated that they have a public school system in St. Louis that is struggling. The failure rate among graduates of St. Louis schools on an examination for the city fire department is so significant that even the mayor has acknowledged that they face a crisis. Upon graduating from high school, students in their community are not equipped with the necessary knowledge and skills. He stated that young people today will face employment challenges if they do not have a great education, including an emphasis on mathematics.

Thinking back on his own experiences as a child, Dr. Wrighton was very interested in numbers. His parents encouraged his inquisitiveness and activity. He believes that it takes a little experimentation and support from parents, but the infrastructure that can be provided in the country's formal educational system is going to be vital for future success.

Many people believe that in the area of medicine and the physical sciences, mathematics in particular, might not be so important. Washington University is one of the major recipients of support for human genome sequencing, and this activity alone illustrates the importance of a strong educational experience in mathematics and physical sciences. Advances in medicine depend on a knowledge base that stems from an investment in mathematics education for its young people.

Dr. Wrighton said he hopes that the Panel will be able to bring improvement to the system. He looks forward to seeing the report and most importantly, the follow-up from the report by the Secretary of Education.

OPEN SESSION:

TASK GROUP AND SUBSOMMITTEE REPORTS: SUBCOMMITTEE ON THE NATIONAL SURVEY OF ALGEBRA TEACHERS

Tom Loveless, Chair; Deborah Loewenberg Ball; Skip Fennell; and Vern Williams.

Chair Faulkner stated that he would begin the session with the presentation on the National Survey of Algebra Teachers. Early in the Panel's discussions, the members recognized the need for input from algebra teachers to inform the Panel's work. Exxon Mobil provided a generous grant for a professional survey, which was in the field last spring.

Tom Hoffer, from the National Opinion Research Center (NORC) at the University of Chicago, also presented. NORC is the contractor that carried out the survey.

Dr. Loveless stated that the National Math Panel decided they wanted to survey the views of algebra teachers across the United States. The subcommittee drafted a request for proposals, which went out to bid. NORC was ultimately selected as the project contractor.

DR. TOM HOFFER, DIRECTOR OF THE NATIONAL OPINION RESEARCH CENTER'S (NORC) JOINT CENTER FOR EDUCATION RESEARCH:

Dr. Hoffer stated that the survey was designed to provide a nationally representative sample of Algebra I teachers in public schools. NORC sought a sample of 310 schools from lists of all schools that contained an eighth grade or higher. They stratified the population of schools so they would have representative samples of schools by grade configuration, that is, high schools, middle schools, and combined middle schools and high schools. They also stratified the sample by the demographics of the school, particularly the percentages of students who are eligible for free and reduced-price lunch program participation, the percentage of racial ethnic minorities enrolled in the school, and the school location--urban, suburban, or rural.

Of the 310 schools, 258 agreed to provide rosters of their Algebra I teachers, representing an 83 percent cooperation rate. Of the 1,026 teachers identified on those rosters provided by the schools, NORC were able to obtain 72 % of the completed questionnaires by July 1st, 2007.

Given this good response rate by survey standards, particularly in the short period of time available to collect the data, the results discussed today are based on responses from 743 Algebra I teachers in public schools across the country.

The demographic and background profile of the teachers indicates that about 66% of the teachers were female. The race ethnicity background indicates 85% White, 6% Hispanic, 3% African-American, and 3% Asian. These numbers compare quite closely with other national surveys, yet we have somewhat lower representations of African-Americans in this sample of Algebra I teachers, than seems to be the case from particularly the school and staffing survey that the U.S. Department of Education does. there was a somewhat lower [MSOffice] representation of African-Americans in this sample of Algebra I teachers. This also seems to be the case by comparison to the school and staffing survey that the U.S. Department of Education conducts. That survey shows about 8 % African-Americans versus the Panel's survey participation of 3%.

The median age is 41 years old. About a quarter of the teachers are 30 years old or younger, and about a quarter are 51 years old or older.

In terms of the education background and education experience, approximately half have a master's or other advanced degree. Sixty-eight percent of all teachers had a major or minor in

mathematics for their undergraduate degree. About a third of those who had master's or other advanced degrees had a specialization in mathematics for their graduate program. Dr. Hoffer stated that approximately 20% do not have a specialization, either at the undergraduate or graduate level, in mathematics.

About 82% of these teachers have a regular state certification, and the National Board of Professional Teaching Standards has certified 12% of these teachers. 83% report that they are highly qualified according to the No Child Left Behind criteria.

Approximately a quarter of these teachers are very new, with 2 years or less experience, and about a quarter have been teaching Algebra I for 15 years or more.

Dr. Loveless stated that ~~Section one (MSOffice2) the first category of findings~~ deals with student preparation, ~~and Section two (MSOffice3) concerns primary findings~~. The ~~main~~ first finding was that there are skill and knowledge areas of inadequate preparation. The second ~~category~~ ~~main point~~ looked at teachers' work-related attitudes. There were two primary findings in that area. The first deals with professional preparation and development, and the second with the teaching materials and curriculum that are used in classrooms. Finally, there were findings related to the use of instructional materials and the main challenges for teachers.

One issue of teacher preparation is addressed by questions about how well students are prepared. This was a composite of 15 different preparation items with poor being on the left hand side of the scale and excellent on the right. For the most part, teachers indicate that their students are not very well prepared, with a large percentage of teachers responding in the fair to poor category.

The most proficient students in mathematics in the United States take algebra in eighth grade. Eighth grade teachers felt that their students were better prepared than teachers in later grades. Dr. Loveless wanted to note that difference.

The second difference that should be noted is that there were statistically significant differences, ~~but they were small by school demographics (MSOffice4)~~. Teachers in schools with high minority student concentrations rated the preparation of their students lower than teachers in other schools, ~~but this difference was reduced and not statistically significant in the full regression equation~~.

Dr. Fennell stated that when looking at student preparation issues as rated by teachers, with a rating of poor being a 1 and excellent being a 4, the top area of concern is solving word problems. Work with rational numbers, particularly involving operations with fractions and decimals, comes in a close second to that. It is followed by basic study skills and work habits, and the ability to use math in context as within a real world situation, indicating a concern about actually using the mathematics.

The top four areas that received higher ratings were understanding the concept of variables, ability to plot points and graphs lines on four-quadrant coordinate planes, working cooperatively with other students, and work with whole numbers and operations involving whole numbers.

Mr. Williams presented the findings in relation to preparation issues, which showed students needing to be better prepared in basic math skills and not be so dependent on calculators. Algebra teachers responding to the survey also would like for the first- through eighth-grade teachers to concentrate more on the foundations of math, so that students know their basic skills in order to succeed more in algebra. Topics of concern include items such as order of operations, integers, fractions and decimals, as well as study skills, and work ethic and doing homework.

Dr. Fennell stated that the survey respondents found their Algebra I textbooks to be pretty good and they were rated favorably. For example, 90% strongly agree, "The textbook includes the appropriate topics and content to teach the course." Relative to resources for students who might be struggling in Algebra I, the availability of tutorial or remedial assistance rated fairly high with 74% fair or better, and the quality of tutorial and/or remedial help 80% or better.

Continuing in terms of teacher satisfaction, 70% rate Algebra I curriculum standards and assessments or tests as good or excellent. Eighty percent rate local expectations to be about right.

For teacher professional development opportunities, 74% rate it adequate or very helpful to them in their work.

Dr. Hoffer stated that the survey asked a number of questions about the use of instructional materials and the first of these had to do with technological tools. For the most part, teachers of Algebra I do not make extensive use of the tools asked about on the survey, specifically graphing calculators and computer based instructional materials. For both of these, the group responded very much toward rarely and never, and very few teachers use these even once a week. Only a third of the teachers reported ever using graphing calculators and another third less than once a week. Similarly with manipulative materials, physical objects that can be used to illustrate algebraic concepts were used very rarely by teachers at any of the grade levels. They were used a bit more at the middle school level, but generally not much at all, and only 29 % used them once a week or more.

Dr. Loveless stated that the survey then asked a series of questions dealing with challenges that teachers face related to instruction and curriculum. The first one dealt with family participation. Sixty percent of the teachers rated that as a moderate or serious problem for their students. The second challenge that teachers identified was mixed ability classes and 45% of algebra teachers considered this a moderate or serious problem. The biggest challenge they identified was working with unmotivated students.

Dr. Ball reinforced that 62% of the teachers surveyed named unmotivated students as their biggest challenge. The second most frequently named challenge was making mathematics successful and comprehensible, which was identified by 11% of teachers. This is of interest because the remainder of the items selected were about instruction, e.g., explaining concepts and explaining material to struggling students.

Teachers overall rated their students' preparation as inadequate. They thought that the curriculum and instructional guidance they received was reasonably good.

What the Subcommittee draws from this is that at the levels prior to Algebra I, there is a need to remedy the student deficiencies teachers are identifying. Also, there is a need to understand what creates the lack of motivation among students.

Dr. Wu stated that he was shocked by the finding that 90% of the teachers thought the textbooks were good or excellent. Textbooks are not that good, and he wanted it on record.

Dr. Loveless stated that they were also surprised by that finding.

Dr. Whitehurst stated there seems to be an inconsistency in the use of the scales to report findings. Sometimes it is the two top levels of the scale that agree and strongly agree and sometimes it is the top three. Sometimes 15% disagreeing is viewed in the lowest category as a good thing and sometimes the same finding on the other side is viewed as a good thing, as well. He stated the need to pay some attention to how the four point scales are broken out and how they characterizing the findings.

Dr. Siegler asked about the data on calculators and software. Teachers might not use these very much either because they did not want to or because they were not available, which are two very different reasons. He asked whether the survey broke down how frequent each of those situations was the cause of the limited to non-existent use.

Dr. Hoffer stated that they did not cross-classify those yet, though he thinks it is a very good question and needs to be addressed. He thinks that they did have some questions about availability. He will follow up on that.

Dr. Loveless stated that regarding the observation Dr. Whitehurst made, the full report will have all the raw data.

Dr. Fristedt noticed that teachers find the most troublesome thing with the students they interact with is lack of motivation and inadequate previous knowledge, rather than the things that

they themselves are most connected with. But even taking that into account on the preparation issue, the percentages are quite dramatic.

Dr. Fennell stated that it is an excellent point, and a point they discussed at length.

PUBLIC COMMENTS:

MR. RICHARD SCHAAR, EXECUTIVE ADVISOR, TEXAS INSTRUMENTS, INC. (TI)

When Mr. Schaar appeared before the Panel in Palo Alto, he reviewed the history of calculators in mathematics education starting in 1986. Today, he stated he would jump forward over two decades to review conclusions from research reports on data collected during the 2006/2007 school year on a pre-algebra and algebra program that TI has named “Math Forward.” The full research reports are in TI’s August 20th comments, which he has shared with the Panel. They have not yet been peer reviewed, but they are indicative of what is working effectively in the classrooms today and should be considered as such.

The Math Forward Program includes eight equally significant components, of which technology is only one, but he described that component in more detail because of what the Panel is considering. Math Forward teachers use technology daily to enhance lessons, provide students with feedback about learning, and reinforce mathematics content. Graphing calculator research that was included in TI’s earlier comments shows that when students use graphing calculators to visualize mathematic concepts and principles, deeper understanding results.

In addition to graphing calculators, each Math Forward classroom is equipped with the TI-Navigator Wireless Classroom Network. The network links students’ calculators with the teacher’s computer, which is loaded with special software to allow two-way communications for instantaneous distribution of activities and formative assessment. The teacher can send questions to the student devices, and the students can return their answers, allowing evaluation of student understanding. This research-based technology is uniquely designed to transform the interaction patterns and mathematics dialogue of the classroom.

With this as background, Mr. Schaar then gave a sampling of Math Forward results for the past school year. In Richardson, Texas where the program began, the district assumed management of their Math Forward program and expanded it to five middle schools and pilot classes in ninth-grade Algebra. Forty-six percent of the middle school Math Forward students, who had not passed the state test in 2006, passed it, as compared to 32% in the comparison group. Similarly, 57% of the Math Forward algebra students attained proficiency in 2007 while the comparison group had a 34% pass rate.

In addition to Richardson, TI also has Math Forward pilot programs in other school districts in Euclid, Ohio, West Palm Beach, Florida, and Dallas, Texas. In both Euclid and West Palm Beach, the Math Forward students did better against a proficiency measure than the comparison students. The results were mixed in Dallas.

As TI enters year 3, they will follow four paths with regard to Math Forward. The first is scalability, and the intention is to expand the program both within districts and geographically. The second is sustainability, where they will build internal capacity within each district. The third is completeness, and the objective is to ensure that each program uses the eight synergistic components of the intervention making a coherent and complete whole, which maximizes student outcomes. The fourth is learning, and the underpinning of the entire effort is research. TI has engaged SRI International to perform independent evaluations of all sites.

These latest results on Math Forward have reinforced the two principles that have been governing their development path for these two decades. To achieve and sustain student performance improvement, they have learned that key elements of the mathematics education system need to be addressed in a coherent integrated way. To be effective at improving student learning and achievement, technology needs to be integrated into a coherent and complete

instructional program. When this is done, technology becomes an enabler to integrated instruction, curriculum, and assessment, thus resulting in increased student achievement.

Mr. Schaar then stated that TI would like the Panel to recognize their systemic intervention hypothesis, and support additional research to improve and scale the Math Forward Program. TI would also like the Panel to acknowledge that graphing technology, when applied in an appropriate manner by a trained professional teacher, can have a positive impact on student achievement, especially when integrated into a coherent and complete instructional program.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Reyna asked about their regression/discontinuity analysis, whether they are using randomized assignment, and if not, why not. She also asked whether they intend to have the products of this research subjected to peer review and publication.

Mr. Schaar responded that they have not had a chance to start that process. He believes they are using the regression analysis on the comparison, but will confirm that.

Dr. Siegler asked if when a district participated, did that mean that all algebra teachers in the district were participating or if they could opt out? And if so, did they monitor the use of the calculators by the teachers and was the amount of use related to the gains?

Dr. Schaar stated that it is an eight-component program so the teachers could not opt out of any of the pieces of the program if they were selected. The teachers and the program monitored the use of the technology. They carried out specific training early in the school year. The teachers tested the students on material they had discussed the day before, and with those results, they would either go on or re-teach. They saw a greater use of the calculators in these cases.

Dr. Siegler followed up by asking if the teachers who used the calculators more had classrooms that showed greater gains.

Mr. Schaar replied that he did not know if they could separate that out. They can say of the people who used the total system that their students did better than the people who used only parts of the system. In West Palm Beach, Florida, one of their practices is to double block students in math. In that particular district any student who had not achieved proficiency the previous year ended up getting double blocked, yet their students did better because it was part of the integrated system.

In other districts, TI trained teachers taught both Math Forward classrooms and non-Math Forward classrooms, and they had access to both technology and teacher professional development from the program. The people using the total program did better than the ones who were partially using it.

Chair Faulkner asked about the phrase “integrated system,” that indicated positive results were consistently demonstrated with the use of calculators in an integrated system. He asked if Mr. Schaar could be a little more explicit about what he means by integrated system.

Mr. Schaar stated that it was not just the technology because the system included teacher content knowledge, classroom management skills, and other kinds of work on pedagogical knowledge. They used University of Michigan tools to evaluate the teacher's specialized content knowledge and put a whole program together, which also included materials. Chair Faulkner followed up by asking if even the technology had multiple elements, and Mr. Schaar replied that it did. Chair Faulkner asked if there were individual calculators and the networking system. Mr. Schaar replied that he was right; it was all integrated. Teachers could use it for formative assessment, the student could use it for drill and practice, and there was an integration that allowed the teacher to see what was going on. Chair Faulkner asked if there was a particular curriculum that was a part of the integrated system. Mr. Schaar replied that they took the school's basic curriculum and augmented it. Each of the proficiency measures is matched with the

individual state's test so they have to modify the curriculum. But, they took the school's curriculum as it existed, augmented it, and then wrapped around the integrated system.

Mr. Williams asked if TI is planning to do any research to find out if the technology alone has a positive effect without the other parts of the eight-point program.

Mr. Schaar responded by stating that they do not know yet.

Dr. Whitehurst stated that it looks like 12 classrooms are involved in this study, but Dr. Schaar mentioned 6 intervention classrooms. The number of comparison classrooms is not stated in the analysis. Mr. Schaar responded that they had more than 12 classrooms. Dr. Whitehurst stated that on page 2 of the year-end report, 194 students were enrolled in the Math Forward classes taught by the six teachers at the junior high schools. He stated that the analysis seems to have taken the number of students as the unit of analysis, where in fact, it is the classrooms that are the appropriate unit of analysis. So, instead of having 400 plus participants, they have 12 or so participants, which cause the significance levels to be a lot less.

Dr. Berch asked to what extent do they assess or observe the use of technology in general, or calculators specifically, in the comparison classrooms. Mr. Schaar replied that they let them do as they had been doing, and in some cases they knew technology was being used and in others cases it was not. Dr. Berch asked if they are going to assess comparison groups. Mr. Schaar said yes, they plan to do that.

PUBLIC COMMENTS:

MS. ELIZABETH GNALL, RIDGEWOOD, NEW JERSEY

Ms. Gnall lives in the public school district of Ridgewood, New Jersey, which she described as a segregated district. On one side of town, elementary school children are taught math following the logical sequencing of topics honoring the scholarly body of mathematics. In the other part of town, this math curriculum is not taught, but instead, it is left for the children to discover and to construct. The math meant for grades beyond kindergarten includes the use of scissors or paper clips and any other object as manipulatives. This is the side of town where her children attend school.

One of her children was struggling to learn within that environment and as any parent would do, she raised her concerns to the school system. But those concerns were met with the comment, "Our math is for all the children." Outside of the school, she found a teacher using a traditional math program that presented to her child math concepts sequentially, logically, and her child practiced, practiced, practiced. Her child learned math.

Her other elementary, school-aged child readily grasps the concepts, yet in that same school, he was bored. Once again, her concerns were met with, "Our math is for all the children." She sent this child to the same program as her struggling child.

Ms. Gnall has spoken to teachers, superintendents, elected board of education officials, reporters, and government officials; she has created a website and authored a petition; and she is now speaking before the Panel. She said that across the United States parents just like her would ultimately triumph over math wars because it is their children, not the children of the state. And for their children, their education is more important and held more dearly than any social, political, economic or ideological agenda.

In Ridgewood, New Jersey Ms. Gnall reported that reformed math programs are on the agenda. Some parents in Ridgewood have been given more information, others less information or biased information, and it has all been delivered as if it were scientifically research-based information. The findings of the Panel can hold great significance, but only if what they present is crystal-clear information.

Ms. Gnall stated that her husband and she are the best and wisest parents for their children. Give them a choice in math education, and they will choose a math education that is rigorous; focuses on content; is not driven by constructivist pedagogy; emphasizes the learning of

mathematical facts, principles and algorithms; uses the proper language and symbolic notation of math; and defines mathematical reasoning as those interconnections within mathematics.

It is the kind of math that is being taught in other parts of this nation and the world. She believes that this math will provide a solid foundation for her children. So, if they desire, they can pursue any career they want.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Reyna acknowledged that she traveled all the way from New Jersey to deliver this message.

PUBLIC COMMENTS:

MR. STEVE NOBLE, DIRECTOR, ACCESSIBILITY POLICY, DESIGN SCIENCE, INC.

Mr. Noble thanked the members of the Panel. Representing Design Science, he also serves on the National Board for the Learning Disabilities Association of America and the U.S. Department of Education's National Instruction Materials Accessibility Standard (NIMAS) Development Committee. He appeared in front of the Panel to talk about students with disabilities of all types and forms, and the accessibility of math instruction in the United States.

Design Science is best known for the Math Type type-setting application or the Equation Editor in Microsoft Word. They have received significant funding from the National Science Foundation to create the technology infrastructure necessary to make math materials accessible for students with disabilities who use assisted technologies. Assisted technologies have been found to be a very key factor in allowing individuals with disabilities to be able to access the general curriculum.

The United States has approximately seven million students who are served under special education. There are students beyond that who have disabilities and are served under American Disabilities Act Section 504 plans who have not been identified by school systems.

National Assessment of Educational Progress (NAEP) math scores show great disparity between a population of students with disabilities and students without disabilities. Educational communities have done a lot of work in creating access to the general curriculum in literary content, but it still has a ways to go when it comes to math materials. One of the issues has to do with the creation of universally designed instructional materials where digital content is a key factor. Math instructional content produced in our country is not accessible to students who use assisted technologies because it is done in graphical inch formats instead of math that can actually be interpreted by assisted technology.

The key technological solution is mathematical mark up language. MathML is an open WC-3 standard, worldwide web consortium, that creates standards like html and xml, and it has also created the MathML standard. It is a non-proprietary, universally designed digital format made to be fully accessible from the beginning for students who happen to have the need of using assisted technology. It can certainly be used as the source file for the creation of all kinds of formats for various types of students, not just students with disabilities, but also for other students.

Once material is in MathML, it can either be used for creation of synthetic speech applications to create spoken math. In digital environments, math expressions can be highlighted as they are spoken; it changes the fonts, style and color.

Whenever there are information dissemination programs that touch on math curriculum, Mr. Noble recommends that they include the essential details about how to make math a success for those with disabilities, instead of just throwing the information out there. When it comes to math instructional content and assessments, there needs to be guidance in the Panel's report that MathML can be used to create these formats for students with disabilities. Moreover, there should

be a recommendation that research and development in math accessibility be put forward in federal programs.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Fristedt stated that in the recent past in this country people have focused on what students should learn by certain stages. He then asked what would happen if we were to focus on what students were to learn, but were more forgiving about when that should be accomplished. He also asked if this would be of help to some of the students he is concerned about or would it not be very relevant. Mr. Noble responded that the question does not directly touch the issue of math accessibility. Mr. Noble asked if he was talking about the possibility of having differentiated ~~initiated~~ standards for students who are in certain groups and have certain types of disabilities. Dr. Fristedt said he was focusing not on more differentiated standards, but differentiated speed in which to accomplish things. Dr. Noble responded that yes, that is sometimes done in individual education programs (IEPs) that are set up for students who have served under the IDEA, the Individuals with Disability Education Act. Materials in an alternative format could provide a level of access to them where they could perhaps be able to excel at the same level as their peers.

Dr. Whitehurst asked Mr. Noble if he could describe what the challenges and impediments might be to adopting a math mark up language universally. He also asked if that language is the technology that underlies math symbolization in Microsoft Word and if a Word document is based on that technology, what happens when an assistive technology reader encountered a summation sign. Mr. Noble responded that Microsoft Word has Equation Editor within it that will embed a certain type of format that can easily create MathML.

Mr. Noble also responded that the major impediments they find right now, as far as a nationwide adoption of this technology, have to do with how things happen in the publishing industry. Most math textbooks start out as a Microsoft Word document with Math Type equations, and the MathML could easily be pulled out of that. The MathML is stripped out as the book goes through the production process. It would be a better process to get companies like Adobe or Quark, which make some of these page layout programs, to retain the MathML programming. Publishers would need an incentive to do this.

PUBLIC COMMENTS:

MS. MARGUERITE BLISS, PARENT, CLAYTON MATH MATTERS

Ms. Bliss thanked the Panel for the opportunity to share her comments. Her comments are mostly anecdotal and are based on her own experience as a parent in the Clayton, Missouri, School District. She became concerned about her children's math education in her school district about five years ago when her middle daughter was in seventh grade. She was focused on getting her into the honors track because her district had just recently adopted Core Plus Integrated Math for non-honors students at her high school.

She knew little about Core Plus curriculum, except that her community was up in arms when it was approved to replace traditional math at their high school. She met with the math coordinator at their middle school to try to move her daughter who had been in Everyday Math and Connected Math into the honors track. She was getting straight A's in math. The coordinator stated that her daughter was not honors material and showed her a standardized computation test she had taken the year before on which she had scored 37%.

Ms. Bliss believed her children were getting a fabulous math education, and believed the teacher's claims that higher order and critical thinking were the hallmarks of Everyday Math and Connected math. Many families in her district sent their kids to Kumon Math.

Her daughter was placed in Core Plus Integrated Math in high school, and there was much confusion about homework assignments. Her fourth-grader had much more rigorous homework at that time. Parents banded together to petition the district for an alternative to integrated math for their middle track students. Honors students were taught traditional math, and she wanted that for her kids as well. They were finally successful in getting traditional math offered as an option for middle track kids. But, those students who wanted to move into traditional math were told they had to take special algebra tutoring after their first year of integrated math at the family's expense. She learned that if her daughter had stayed in integrated math, she would not have begun to focus on algebra until her junior year.

They enrolled their younger daughter in Kumon, now viewing it as an absolute necessity instead of an unnecessary burden inflicted on her by overachieving parents.

The district still promotes integrated math as the recommended curriculum for middle track students. Students complain about their lack of preparation for college calculus. The district has seen an alarming increase in the percent of graduates who wind up in remedial math in college.

Affected parents created a website for other parents in the district as a resource to understand the conflicting information they hear from parents and students and teachers and administrators (claytonmathmatters.com). Ms. Bliss believes that extensive research and effective math instructional practices are needed to compete in our world, and that it is irresponsible to promote curricula as exemplary and promising without thorough research on their effectiveness.

PUBLIC COMMENTS:

MS. PATTY POLSTER, PARENT/SPECIAL EDUCATION TEACHER, MARYLAND HEIGHTS, MISSOURI

Ms. Polster thanked the Panel for the opportunity to speak. She is a professional educator and is just beginning a doctorate program in educational leadership. Ms. Polster spoke as a parent and a citizen. She believes that the single most important issue to be addressed in improving the quality of life in the country is public education. She believes that the current educational system could achieve significantly greater outcomes for children by spending more time and effort in evaluating instructional practices and curricula, and less time evaluating children and diagnosing learning or behavior problems within them. She is glad that the Panel is looking at instructional practices, programs and materials that are effective for improving mathematics learning, as well as a need for research in support of mathematics education.

Ms. Polster has spent 14 years in the field of education, and she has often found herself puzzled and frustrated by the decisions that policy makers and professionals make when it comes to identifying and implementing best practices, without reviewing research. The majority of the mathematics education programs she has seen implemented throughout the St. Louis area seems to be based on constructivist theories of how kids learn mathematics. She is most familiar with Everyday Math, which is currently given in the district where she lives, and she is seriously concerned by where she sees her children in first and fourth grade functioning.

She asked the Panel to look at Project Follow-Through, where the direct instruction model showed significant positive impact in study after study, yet schools of education and governmental agencies still completely ignore it. The direct instruction mathematics program designed for school implementation is called "Connecting Math Concepts" and is published by SRA. It presents topics in strand rather than spiral design.

All direct instruction programs incorporate three main components: 1) a program design that identifies concepts, rules, strategies and big ideas as well as clear communication through a carefully constructed instructional program; 2) organization of instruction including scheduling, grouping, and ongoing progress monitoring to ensure that each student receives appropriate and sufficient instruction; and 3) student/teacher interaction techniques that assure that each student is actively engaged with instruction and masters the objectives of each lesson.

She would like to see a federally funded comparison utilizing a strong research design and taking into consideration the use of tutoring services for those programs that compare the Connecting Math Concepts Program to any or all of the constructivist spiral programs.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Fennell asked Dr. Loveless if he has looked at Project Follow Through. Dr. Gersten responded that he probably knows more about Follow Through than anyone on the Panel. They only looked at those studies past 1976, and they did not look at this type of more philosophical evaluations of different approaches to teaching. Dr. Loveless responded that they did search the literature on direct instruction and other interventions since 1976.

PUBLIC COMMENTS:

DR. WILLIAM F. TATE, IV, EDWARD MALLINCKRODT DISTINGUISHED UNIVERSITY PROFESSOR IN ARTS AND SCIENCES AND CHAIR, WASHINGTON UNIVERSITY

Dr. Tate testified on behalf of the American Association for Colleges for Teacher Education (AACTE), which represents 800 schools, colleges, and departments of education across the nation. They recognize the nation's critical need to increase the quantity and quality of scientific personnel to compete in the global economy and to bolster the technical skills of the workforce to enhance creativity and innovation.

His comments focus on elementary and middle school K-8 mathematics, particularly item (e) in the Executive Order regarding the training selection, placement, and professional development of teachers in mathematics to enhance students' learning of mathematics. AACTE offers eight policy recommendations to the Panel that they believe will significantly improve the quality of mathematics teaching and teacher preparation programs.

1) Request major government support for synthesis and wide dissemination of the best research available on the teaching and learning of mathematics. This should be an ongoing service provided without charge to the public.

2) Support research on critical mathematics teacher and teaching issues. This research should include at minimum, a description of the current status of mathematics preparation on the part of K-8 teachers; the essential content for high quality mathematics teacher preparation; the optimum length of course work and critical experiences; and research on the ideal structure, nature and synthesis of courses.

3) Encourage consensus-building efforts to develop high-level mathematics standards.

4) Support the development of student databases with links to teacher preparation programs. The Panel should recommend the appropriation of funds sufficient for all states to develop and implement longitudinal data systems with the capacity to track the performance of individual students from year to year, link those students with their teachers, determine the impact of those teachers over several years, link those teachers to the preparation programs, and ultimately identify the program characteristics associated with the greatest levels of student achievement.

5) Encourage and support teacher preparation reform at both state and federal levels.

6) Call for the elimination of out-of-field teaching. With 18% of middle school mathematics teachers assigned out of field, he stated that the Panel should recommend that all states phase out the practice of out-of-field teaching by setting a disappearing cap on the number of out-of-field placements permitted by each district, each year, until ultimately the cap becomes a ban.

7) Encourage investments in mathematics teaching, recruitment, and retention efforts, given the shortage, the high rates of turnover, out of field teaching, and the lopsided diversity among mathematics teachers. Research shows that strong induction programs with training mentors make a positive difference in the retention of novice teachers and improving teaching practices in school. Interest exists in enabling school districts to offer schoolteachers compensation that is more closely aligned with other careers. Nothing less than a federal Marshall Plan is needed to greatly enhance the recruitment and retention of excellent mathematics teachers, particularly for high-need schools. Substantial funds should be authorized for a variety of promising programs.

8) Provide for an equitable distribution of high-quality teachers. The Panel's report should clearly articulate this issue and insist on enforcing existing reporting requirements and the prohibition of mal-distribution practices and on the appropriation of funds to carry out the recruiting, retention recommendations noted above.

He closed by noting that there is research that the nation is creating consensus around standards.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Reyna asked Dr. Tate about the dissemination of materials, and for more detail about that recommendation. Dr. Tate responded that the disconnect between many research syntheses and the public is quite high. They are not disseminated freely.

Dr. Ball stated that he correctly identified that more knowledge is needed about teacher education, professional development, induction and so on, and asked what he thought it would take to produce a kind of knowledge base about these issues to build a qualified teacher core and then distribute ~~that knowledge base~~ ~~them~~ ~~here~~. Dr. Tate responded that there is a major difference in how knowledge is distributed in medical science versus what is done in education. His personal opinion is that there is not a system in place to disseminate peer-reviewed work at a high level, even within colleges of education. People involved in teacher education do not have research in their hands that has received the government stamp of approval for peer review. He stated that the closest they have are National Research Council Boards. There is no dissemination process for this research.

Dr. Gersten stated that one of the Panel's groups has made a decision to only include the most rigorous research and to synthesize that. He asked if that is in line with some of Dr. Tate's thinking. Dr. Tate responded that they have to define rigorous. Dr. Gersten responded that it is in terms of the experiments. Dr. Tate responded that he certainly thinks that those should be included and are vitally important. He appreciates that the Panel is communicating that rigorous studies should take place more often, but he is also disappointed that there is a limited amount of research that is being done that way, given the path the funding streams have followed in the past. So, by default, the Panel will come up with certain kinds of recommendations, just because there has not been an abundance of that type of work. Less rigorous research may still lead the Panel to a way of triangulation to look at various forces to make sense of what directions are most appropriate.

Dr. Gersten added that they would look at the math program mentioned by the previous speaker as it does fit within their 30-year limit.

PUBLIC COMMENTS:

**DR. J. MARTIN ROCHESTER, CURATOR'S DISTINGUISHED TEACHING
PROFESSOR OF POLITICAL SCIENCE, UNIVERSITY OF MISSOURI, ST. LOUIS**

Dr. Rochester thanked the Panel for the opportunity to comment on their work and the issues at stake in this project. He is a political scientist not a mathematician, but he has spent more than 30 years as a professional educator and also as a parent observing one failure after another in K-12 education. He has written about this in a book entitled *Class Warfare*, as well as in *Education Week*, *Phi Delta Kappa*, and in other publications.

He stated that fuzzy math, integrated math, Everyday Math, Core Plus, and the other reformed math curricula now dominant in K-12 education have been driven by the same constructivist paradigm that gave the country the now discredited whole-language pedagogy in English.

Under the guise of critical thinking and problem solving, Dr. Rochester stated that fuzzy math is trying to make math more interesting. The new math de-emphasizes and devalues direct instruction, drill and practice, basic computation skills and getting it right. The key concern, he stated, is to alleviate boredom and drudgery from math phobes and those who suffer from math anxiety.

Most of the math professors Dr. Rochester has spoken to at his university are appalled at the lack of basic computation skills students now bring to campus from K-12. Not surprisingly, parents have to enroll their kids increasingly in Kumon math tutoring courses to compensate for the failure of schools to provide a solid foundation. In his own school district of Clayton, dozens of parents, including the president of the school board, a Harvard MBA, have resorted to Kumon math for their kids ever since fuzzy math was introduced into the district.

As a college professor, he told the Panel that the K-12 education system in the United States is becoming dysfunctional as it is turning the pre-collegiate and collegiate levels upside down.

PUBLIC COMMENTS:

**MS. JENNIE WINTERS, MATH AND SCIENCE COORDINATOR, LAKE COUNTY
OFFICE OF EDUCATION, ILLINOIS**

Ms. Winters thanked the Panel for allowing her to speak today. She is the math and science coordinator for the regional office of education in Lake County, Illinois. Her responsibilities include facilitating professional learning and curriculum development for 45 school districts, which encompasses 265 schools and approximately 11,000 teachers. During her interactions with these personnel, she has been able to observe what it is like in the trenches.

Ms. Winters stated that mathematics achievement is not about the program. While some programs have best practices embedded within the lesson design, she believes that a knowledgeable teacher can do great teaching with whatever resources are available. The key is the level of mathematical understanding the teacher possesses. Many educators do not have an understanding of math, and therefore becoming mathematically literate should be a priority for all educators to ensure the mathematical literacy of the youth of our nation.

She stated that elementary teachers are expected to lay the foundation of mathematical understanding so that content specialists at the middle and high school can build upon that foundation. But at the same time, they are also expected to lay the foundation in reading, writing, science, social science, health, etc. It is very difficult for elementary teachers to be experts in every content area. Therefore it is essential that they have access to support personnel who are fluent in the language of mathematics.

Ms. Winters is pleased to see the math specialist or math coach position emerging in some of our school districts, and she would strongly encourage the Panel to support the implementation of more specialists and coaches. Teachers also need to be comfortable in the use

of differentiation to meet the variety of students that they encounter in their classes. In her observation, while elementary teachers may not be content experts, they can connect with their students. But one cannot effectively differentiate content without a deep understanding of that content. On the other hand, secondary teachers see many more students for much less time; therefore, they may be experts of content but it is difficult for them to make individual connections with each student. Elementary teachers, Ms. Winters stated, need ongoing professional learning opportunities to develop a deeper understanding of math. She asks that the United States examine the mathematics instruction in other countries to see how they successfully were taught using the terminology and techniques to develop a deep level of understanding of mathematics.

Secondary teachers should be given multiple research-based professional learning opportunities to develop a repertoire of pre-assessment, instructional and differentiation strategies to meet the needs of their student population. They need to develop a deeper understanding of process standards so that they can delve deeply into the content. She shared a concern that special interest groups will try to influence this Panel to promote their own agendas for financial benefits, and hopes that they avoid the pitfalls and mistakes Reading First encountered.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Wu asked if teachers could achieve greater things with good textbooks as opposed to bad textbooks. Ms. Winters responded yes, and she has heard elementary teachers do not even understand them. Teachers do not even have the people to explain what it is they are supposed to be teaching the next day. So, it is very hard for people to expect them to lay a good foundation for these kids when they do not even have it themselves. Dr. Wu responded that everything really critically depends on the teacher. Ms. Winters agreed and said that they have districts that use Everyday Math and have tremendous success. They also have districts that use Everyday Math and it is a flop, because of the level of teacher understanding of the program.

Dr. Loveless asked, besides Everyday Math, what the programs are that her district uses. Ms. Winters responded that of the 45 districts she works with, they use a wide range from Houghton Mifflin to Saxon. Teachers have to understand the program before they have to go in and teach it.

Dr. Fennell asked if there are multiple models of elementary math specialist that she is seeing among the districts and if one seems to work better. Ms. Winters responded that her office facilitates a group of coaches that comes together four times a year, and the math coach position is increasing every year. Coaches are there to teach the teachers and to be a resource for teachers. There are other districts that have them taking on classroom responsibilities part of the time and helping the teachers for the rest. Generally those that can be released from the classroom and spend their time in as many classrooms as possible to model and work with those teachers tend to be more successful. They feel more successful because they have the time to really improve instruction and model in as many people's rooms as possible. Dr. Fennell asked if they have significant math content background and Ms. Winters said for the most part, yes. They have to have an endorsement in math in most of her districts.

Dr. Siegler stated that her point about elementary school teachers' frequent lack of sophisticated mathematical knowledge seems very well grounded. He asked if a district's in-service programs could collect data on what mathematical lessons teachers in a given grade have the most difficulty with and then address those in the in-service programs. Ms. Winters responded that they do with periodic surveys, and more often when she does regional workshops. The surveys show issues with fractions, how to get students to understand the difference between problems in measurement, and problem solving.

Dr. Ball asked what difference it would make for her job if she did not face the range of programs she did in her county. Ms. Winters responded that each of the forty-five districts have

different populations, so she would not want one unified program because certain programs fit certain populations. Mobility is a central problem.

Dr. Fristedt asked if math knowledge should be a central part of teacher professional development. Ms. Winters explained that at the elementary level, the focus on math is the biggest issue she encounters. At the middle and high school level, the teachers teach out of the textbook and use the same techniques every time. They do not get to all the process standards. Dr. Fristedt responded that he does not know what process standards are, so that term bothers him.

Dr. Ma asked if Ms. Winters thinks if a teacher teaches Everyday Math or Saxon, which are at two extremes, do they need common content knowledge, or do they need to have a different kind of knowledge in terms of math. Ms. Winters stated that it's important to have a common content knowledge in math. It does not really matter which program they are using. Dr. Ma followed by asking if there is only one kind of math, and if teachers know it, will they be able to teach every kind of program well. Ms. Winters responded that if teachers have a strong foundation in mathematics in which they understand how and why math works, as well as the concepts in geometry, they can work within the constraints of pretty much any program.

Mr. Williams stated that as a teacher, he has pretty good conceptual knowledge of math, but there are certain types of programs he thinks he would have trouble teaching. He also asked if in certain programs working in less mobile districts where students have a better math background, would elementary school teachers who have poor math backgrounds find a better match in a program such as Saxon since it seems to be more focused. Ms. Winters stated that it would have to depend on the population that they are serving. She is not trying to match the program to the teacher, but rather to the students. And then the teacher needs to have the skills to adapt to that program. Mr. Williams followed by asking if she agreed that as students have different learning styles, teachers need different teaching styles to match different programs. Ms. Winters agreed and that is why it is important for them to find a district with a philosophical match to their style.

Dr. Stotsky asked about Ms. Winters' comment on the difficulty middle school teachers have with the Connected Math program, and why this program was chosen. Ms. Winters replied that teachers in this district did not have much say in the choice, but some districts allow for more input than others. Decisions that support teachers and provide professional development for new philosophies are better received. Dr. Stotsky asked if districts knew of the costs associated with professional development for teachers who did not want, or were not prepared for, the program. Ms. Winters responded that some districts are more aware of things than hers. Only some do research on programs.

PUBLIC COMMENTS:

MS. BARBARA ASTEAK, VICE PRESIDENT, SUNTEX INTERNATIONAL, EASTON, PENNSYLVANIA

Ms. Asteak stated that Suntex is the creator of the Twenty-Four Game, a very popular mathematics game, developed in 1988. The game expanded into a series of nine different games starting with one-step addition as the way to algebra. Five years ago, they married the games with the technology of the Internet. It was the first on-line math program, and more than 200,000 students around the United States used it last year alone.

Ms. Asteak stated that this program has proved that it can reach students of all ability levels and all backgrounds. It is engaging and interesting, and the content is rigorous. In 3 years of participation, students who have been enrolled in the program are approaching the solving of their billionth math problem on the website. While the Twenty-Four Game series is the backbone of the "First in Math" program, it also includes rigorous modules where children demonstrate mastery of basic facts in whole numbers, fractions, decimals and integers. In addition there is a vibrant range of bonus modules, where students work on fact practice, word problems, more

practice with fractions, decimals, integers, pre-algebra problem solving, and finally algebra. They have eight skill sets. Most adults in this country could not complete skill set five. But they have 30 fourth-grade students going all the way through the algebra modules.

Students can log on to First in Math from school and home, or wherever they have Internet access. The activities on the First in Math site are designed to introduce skills on a gradient, easy to more difficult. This design makes the program a perfect tool for differentiating instruction. First in Math is self-paced meeting the needs of all students from low achieving to gifted. Philadelphia public schools use the program as their chief mathematics intervention program. Prince George's County, Maryland uses it with all their talented and gifted students. It is aligned to rigorous national and state standards.

Wellstone, the nation's top regional educational laboratory, conducted a scientifically based study about the program in National City, California, with a sample size of 2,000 students. National City is the second poorest school district of its size in the state of California. The study proved students involved in the program saw a small, but substantial, increase on CAT-6, California Achievement Test scores. The study's attitudinal component proved conclusively that students involved in First in Math positively change attitudes about math.

For educators the site provides real-time continuous feedback for teachers, principals, and district administrators. They can track the progress of their students through the site to determine if students are performing at grade-level standards in easy to read printable reports. Perhaps the most distinguishing feature of the First in Math program is the competition element of the program. As kids log on and start solving problems, they receive electronic awards stickers that accrue to both a personal score and their classroom score. Students compete to be the top mathematics team in their school building, school district, state and in the nation.

The fifth-grade students from Parker Annex, a very high-poverty school in Trenton, New Jersey, have no access to the internet at home, but formulated a plan to approach local business leaders to use their computers after school to do First in Math. They emerged as the number one team out of 10,000 teams in the United States.

PUBLIC COMMENTS:

MS. MICHELLE PRUITT, PARENTS FOR REAL MATH, COLUMBIA, MISSOURI

Ms. Pruitt represents a parent group in Columbia, Missouri where the community is a microcosm of the national math debate. The Math Education Department at the state university located in Columbia is heavily funded by the National Science Foundation to promote teacher development using particular math curricula. A number of graduate students earn master's degrees by participating in the implementation of these curricula in the public schools.

The local public school implemented these curricula in 2001, in part to gain access to university graduate students for the Columbia public schools classrooms. But, she asks, who evaluates the effectiveness of these curricula? The public school administrators like to present student achievement in the best possible light.

Students and faculty at Emory's math education department have published numerous papers, not surprisingly supporting the effectiveness of their own efforts. However, Ms. Pruitt states that many of these same publications have been found to lack sound research by the What Works Clearinghouse. At the same time, nationally known standard assessments of student achievement are being ignored. An eight-year record of C+ student scores on the Iowa Algebra aptitude test, spanning the period of implementation of Connected Math, seems to indicate a significant drop in Algebra readiness, but the school district and its leaders have not carefully examined it.

Ms. Pruitt also stated that ACT test scores have dropped and the remediation math rates of students attending state universities have escalated since adopting these math curricula. Parents are justifiably concerned and have signed a petition opposing the current math curricula

used in the public schools. These parents are scientists, engineers, mathematicians, technicians and physicians, and they know the demands of a career requiring the mastery of mathematics.

Ms. Pruitt closed by asking how evaluations of effectiveness and assessment of student performance can be separated from and independent of the development and implementation of curricula. Peer reviewed research is lost when researchers are paid by textbook publishers, and administrators play dual roles implementing curricula and assessing their impact.

PUBLIC COMMENTS QUESTION AND ANSWER PERIOD:

Dr. Wu stated that Ms. Pruitt’s comments about the need for independent evaluation of curricula and other forms of educational activities is very well taken, and they hope that it will be taken more seriously.

Chair Faulkner stated that the Panel is reconvening tomorrow morning at 8:30. The subcommittees and task groups will be reporting in the session tomorrow and making their public presentations on findings and recommendations. The work of the task groups and subcommittees forms a base for the Panel’s Final Report. They will synthesize this work during the last several months of this year to create the Panel Report, which is the report that the President and Secretary sought through the Executive Order.

The session adjourned at 5:45 p.m.

I certify the accuracy of these minutes.

Chair Signature _____ Date _____

Vice Chair Signature _____ Date _____

ADDENDUM: PUBLIC PARTICIPANTS

First Name	Last Name	Organization
Rick	Armstrong	N/A
Hyman	Bass	University of Michigan
Jack	Beers	Metropolitan Teaching and Learning
Anilkumar	Belvadi	SLPS
Julie	Bierach	KWMU
Jarrold	Brown	SLPS
Jennifer	Chintala	Pearson
Lori	Craig	SLPS
Cathie	Dillender	Pearson
Matt	Frueh	McDougal Littell
Joan	Gallagher	Parent
Lisa	Gill	Texas Instruments
Jeanne	Golden	Clayton Math Matters
Anita	Greenbey	Compass Learning
Laura	Grizzle	SLPS
Heather	Gunsallus	Words & Numbers, Inc.
Pamela	Hamped	PD
Mischelle	Handley	America's Choice / NCEE
Ingrid	Iskali	SLPS
Audrey	Jackson	National Council of Teachers of Mathematics
David	Kilper	Washington University, Photo Services
Elizabeth	Lehnerlz	Pearson
Andrea	Maddox-Dallas	Clayton Math Matters
Judy	Martin	Washington University
Michael	McCrary	SLPS
Lynda	McKelvey	Sopris West Educational Services
Chris	Morrison	CTB / McGraw-Hill
Karessa	Morrow	SLPS
Robin	O'Callaghan	The College Board
Leigh	Palmer	Houghton Mifflin Company
Pamela	Powell	Uteach, The University Texas at Austin
Debra	Powell-Childress	SLPS
Rick	Rickhoff	SRA McGraw-Hill
Diane	Schaeter	ASSM Rhode Island Dept. of Ed
Ines	Segert	University of Missouri
David	Whiting	McGraw-Hill
Christine	Willis	Cambium Learning, Inc
Evelyn	Woods	SLPS
Mark	Wrighton	Washington University
Susan	Zareh	Forsyth School