U.S. DEPARTMENT OF EDUCATION
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NATIONAL MATHEMATICS ADVISORY PANEL
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WEDNESDAY,
SEPTEMBER 13, 2006
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SUMMARY
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The Panel met in the Auditorium of the Broad Institute, 7 Cambridge Center, Cambridge, Massachusetts, at 9:00 a.m., Dr. Larry R. Faulkner, Chair, presiding.

PANEL AND EX OFFICIO MEMBERS PRESENT:

DR. LARRY R. FAULKNER	Chair
DR. CAMILLA PERSSON BENBOW	Vice Chair
DR. DEBORAH LOEWENBERG BALL	Member
DR. A. WADE BOYKIN	Member
DR. FRANCIS (SKIP) FENNELL	Member
DR. DAVID C. GEARY	Member
DR. RUSSELL GERSTEN	Member
DR. TOM LOVELESS	Member
DR. VALERIE REYNA	Member
DR. WILFRIED SCHMID	Member
DR. ROBERT SIEGLER	Member
DR. JAMES SIMONS	Member
DR. SANDRA STOTSKY	Member
MR. VERN WILLIAMS	Member
DR. HUNG-HSI WU	Member
DR. DANIEL BERCH	Ex Officio Member
DR. DIANE JONES	Ex Officio Member
MR. TOM LUCE	Ex Officio Member
DR. KATHIE OLSEN	Ex Officio Member
MR. RAY SIMON	Ex Officio Member
DR. GROVER J. (RUSS) WHITEHURST	Ex Officio Member

PANEL AND EX OFFICIO MEMBERS NOT PRESENT:

MS. NANCY ICHINAGA	Member
DR. LIPING MA	Member

STAFF MEMBERS PRESENT:

TYRRELL FLAWN	Executive Director
JENNIFER GRABAN	
IDA KELLEY	
KENNETH THOMSON	
HOLLY CLARK	

CALL TO ORDER

Dr. Larry Faulkner welcomed the meeting attendees to the third meeting of the National Math Panel and thanked Massachusetts Institute of Technology (MIT) for hosting. He introduced Panel member Francis "Skip" Fennell, president of the National Council of Teachers of Mathematics (NCTM). Dr. Fennell introduced three of the writers of the just-published NCTM curriculum Focal Points to discuss that project.

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM) CURRICULUM FOCAL POINTS

Jane Schielack, Associate Dean for Assessment and Pre-K Education at Texas A&M University, opened the discussion of the National Council of Teachers of Mathematics (NCTM) newly-released *Curriculum Focal Points for Pre-Kindergarten through Grade Eight Mathematics: A Quest for Coherence.* The document offers possible solutions to two major on-going problems confronting today's mathematics educators. The first is the evolution of state curriculum frameworks into long lists of learning expectations that vary from state to state and among grade levels. The second is that U.S. math instruction is suffering from an emphasis on breadth, often with a resulting lack of depth. The publication addresses these issues by presenting three Focal Points for each successive grade level. Each set of three Focal Points is accompanied by a cluster of related ideas, concepts and skills for that level. The sets of Focal Points represent a consensus of ideas for a cohesive math curriculum. The result is a practical guide for significantly improving the math curriculum for pre-kindergarten through eighth grade.

Doug Clements, Chancellor's Professor of Education at the State University of New York in Buffalo, highlighted aspects of the Focal Points for pre-K through third grade, years that are essential to children's development in mathematical competence. Mathematics is a core component of cognition. Early mathematical achievement is predictive of later achievement in literacy skills such as reading. In addition, early math success can produce equity benefits. Lower-income children can perform equally well, or even better, than their middle-class peers after experiencing research-based math instruction that develops their conceptual and related capabilities. Mr. Clements then showed, grade by grade, how children progress in counting skills, using increasingly sophisticated strategies to understand whole numbers and methods to manipulate them.

Sybilla Beckmann, professor of mathematics at the University of Georgia, next described the skill sets and operations recommended for grades four through eight. To succeed in algebra, students need fluency in arithmetic, a solid foundation in numbers and operations and in geometry and spatial sense. The Focal Points emphasize student understanding of algorithms of arithmetic, especially the standard ones, and learning to use them to solve problems. She summarized each set of Focal Points for each grade level, showing how they build from the previous level and lead to the next. She stated that students who have learned the material in these curriculum Focal Points for grades pre-K through 8 would be prepared to succeed in higher-level mathematics.

In the question and answer session, Dr. Geary, noting the focus in third grade on fractions and their equivalents, asked if that is the recommended grade level for introducing fractions, or should there be some preliminary introduction in earlier grades. Ms. Schielack responded that, while the Focal Points are designed to highlight particular operations/concepts, there could be preliminary work in earlier grades, with the caution that this not take time or emphasis from the

study areas that are to receive major attention during earlier grades. Mr. Clements noted the first- and second grade work in composing and decomposing geometric shapes obviously establishes a cognitive foundation for work with fractions.

Dr. Schmid, noting that instruction in some countries treats these points sooner, asked if the NCTM recommendations are based on what is typical in the U.S., or whether there is a better way to proceed. Ms. Schielack noted that, as well as reviewing curricula from 49 states, the authors looked at the following sources to make the recommendations: curricula from other countries that are doing well in math instruction, research that describes the growth of student understanding at different stages of development, and input from the project's reviewers. Fitting all these sources together led to the placement of the Focal Points.

Dr. Faulkner asked about the history of the NCTM focal point project. He asked why and when it was formed, and its mechanics. Ms. Schielack responded that a goal of the NCTM is to support what is happening in the classroom, and how to make these things happen well. Her own experience in trying to fit together her classroom objectives, her state's standards, and other national teaching objectives and recommendations was the impetus for looking into the question of how we make varying teaching objectives and varying state standards doable in the classroom as well as more coherent across the curriculum for everyone. NCTM, in addressing this issue with approval from its board, selected a writing group, which was then organized into grade level groups. Each group contained a university-level mathematician or mathematics educator as well as K-8 classroom teacher representation. Building on existing research (e.g., input from the Center for Study in Mathematics Curriculum), a first draft was produced and sent to a list of formal reviewers. The list was crafted carefully to include mathematicians, mathematics education researchers, state curriculum directors, policymakers, people involved in testing/assessment, and classroom practitioners. Their input was incorporated into a consensus second draft that was then reviewed and subsequently approved by the NCTM board.

Ms. Jones noted that bringing such order to multiple goals is an important step forward. She asked if the Focal Points address the question of when calculator use should be introduced. Ms. Schielack said that the authors decided not to address instructional pedagogy at all, so decisions about appropriate tools, materials and instructional strategies are not included in the report. Mr. Clements agreed with the caveat that any document of this sort carries implications that call for implementation approaches/strategies consistent with its vision.

Ms. Stotsky requested comment on the NCTM document's implications for the organization and shape of state assessments. Ms. Schielack said that it would be consistent with processes now being followed. As a state refines its curriculum, it makes changes that in turn compel the assessment group to match its procedures/method to the curriculum revisions. This is generally an on-going process in states, or at least one undertaken at specific intervals (e.g., yearly, biennially).

Dr. Loveless noted that the 1989 NCTM standards had been very influential, used by more than 40 states to create their own standards, and asked if the issuance of these Focal Points implies that these other existing standards need to be refocused in light of this new document. Ms. Schielack said this was a reasonable conclusion. Dr. Boykin requested identification of studies/reports on the equity gap-closing outcomes cited earlier. Mr. Clements agreed to provide them.

Dr. Reyna asked for identification of empirical evidence regarding critical skill progressions or sequentiality, particularly with regard to standards in other countries. Mr. Clements said that this study's emphasis was on following a coherent developmental progression

from grade to grade, rather than in rigidly assigning specific goals to specific time points. Ms. Beckmann added that the study's Focal Points do follow a natural mathematical progression that she believes is not far from what is done in some high-math-performance countries.

Dr. Faulkner commented that Professor Schmidt has compiled a sort of A-plus composite of standards from top-performing countries, emphasizing the coherence that exists within that composite. Ms. Schielack said that, while no formal correlation had been done, she believes there is perhaps an 85 percent match. Differences that existed were relatively minor (e.g., one grade level, even looking at the most highly-regarded overseas curricula as well such as Singapore and Japan).

Several participants asked if the authors had considered making the Focal Points more elastic by compressing or expanding them either in time or in the depth of approach to specific material. Responses to this query all noted that it was important, especially in compressing or accelerating classroom instruction, in which care should be taken not to skip crucial basic instruction

Dr. Ball noted that, in the U.S., standards and curricula are traditionally set at the state or even the local level. She asked if this tradition hinders realization of the benefits anticipated from any attempt to adopt goals or standards on a national level? Responses varied. However, Ms. Jones noted that we already achieve a national curriculum, with some degree of variability, through the content and structure of the textbooks used across states and school districts.

Dr. Berch asked whether success in implementing use of these recommended Focal Points depends on the instructional procedures used. He noted that, while the document insists on the need for developmental sensitivity, it simultaneously promotes concepts and processes such as problem solving and reasoning that are generally considered to be associated with higher levels of age and maturity. He asked whether NCTM planned to address these issues in the future. The authors responded that their suggestions are end goals that are consistent with several pedagogical approaches, no one of which is being advocated.

Ms. Beckmann and Mr. Clements both noted that their recommendations strongly support the need for upgrading teachers' professional development and assistance.

NATIONAL SCIENCE FOUNDATION (NSF)

Kathie Olsen, from the National Science Foundation (NSF), described the NSF's unique mission of funding or supporting research across the entire spectrum of fundamental science and engineering disciplines. The NSF has a special charge to support mathematics, science and engineering education at all levels, including K through eight. Of the agency's annual $6 billion budget, 94 percent goes directly to the research and education community to further its charge to act as a catalyst for new insights in research.

As a nation we annually spend $850 billion on education. State and local governments supply about $600 billion of that. The federal government only provides about 10 percent of the total. In K-12 education, the federal expenditure percentage is even lower, about 8.3 percent. Of that, the NSF's Education and Human Resources (EHR) budget is approximately $260 million, and mathematics expenditures are only a part of that amount. NSF's EHR research projects are targeted to four broad areas of research and development: 1) innovative curriculum models and related instructional materials; 2) models for teacher preparation and professional development; 3) education research to fundamentally advance teaching and teacher preparation; and 4)

fundamental research on learning.

NSF is building a base of knowledge about math and science learning, particularly about the diverse ways that children learn. Investigations generally start out at the level of very fundamental research with small scale pilot testing, followed by revisions based on what is learned. Because findings from such small projects might not scale up, field-testing on a larger scale is then conducted with further revisions before publication.

Five NSF programs currently support K-12 mathematics education. One of these programs is Research on Evaluation and Education in Science and Engineering (REESE). It is funded at $42 million and is NSF's fundamental program of basic applied research to help educators investigate what works and for whom. Second is the Discovery Research K-12 program (DRK-12), a consolidation of NSF programs in the Teacher Professional Continuum (TPC), which consists of instructional materials development and centers for learning and teaching. Third is a new program, shared with the Departments of Energy and Education, which consists of math/ science partnerships with the Department of Education and institutions of higher education, state education departments, local school systems, and business and industry. It is aimed at improving mathematics and science achievements for K-12 students. A fourth program focuses on No Teachers Left Behind, which is a scholarship program that awards $10 million to juniors or seniors who are majoring in the areas of science, technology, engineering, and/or math (STEM). The scholarship program enables them to take courses in education and to become certified. Such teachers must then work for two years in underachieving schools. Fifth is a $47 million program for graduate teaching fellows in K-12 education. They work with teachers in the classroom to integrate classroom math and science learning with their in-depth knowledge and research experience.

NSF devotes limited funding, about $2 million annually, to research for downstream investigation of the effectiveness and impact of project results that have been successful on a small scale. Such evaluations are only possible after there has been sufficient publication and dissemination of results. There must also be adequate acceptance in the market on a scale large enough to provide reasonable sample sizes. Large-scale implementation can last a decade or more.

NSF conducts rigorous merit review procedures. In the last three years, nearly 7,000 panelists have evaluated EHR proposals. The agency has a committee of visitors with two primary responsibilities. These responsibilities are to oversee the integrity and efficiency of the NSF proposal review process and to evaluate the quality of the results of NSF projects. The Office of Management and Budget (OMB), in its rating of federal agencies, gave NSF the only perfect score in government. Every NSF education program has to include an evaluation component that is peer reviewed. NSF also contracts for external evaluation for many of its programs.

Noting that some NSF critics have asserted that the agency has a constructivist pedagogical bias, Dr. Loveless asked for an example of a major NSF project that supports direct instruction. He also asked whether NSF research supported textbooks and whether the research has been evaluated using Randomized Control Trials (RCTs).

John Bradley cited two such evaluations and noted that RCTs are difficult to conduct until materials have been widely enough used so that sufficient data can be collected. Mr. Bradley and Ms. Olsen both emphasized that, as an organization that primarily funds rather than conducts research, NSF is constrained by the nature of the proposals it receives. Dr. Wu noted that EHR

has been criticized for slighting the mathematical component of mathematics education and suggested that EHR could draw on the Division of Mathematical Sciences to help with writing requests for proposals to make clear that the mathematics component is important for evaluating proposals. He also asked whether EHR critics could be invited by the committee of visitors. Ms. Olsen noted that, while there has been validity to certain criticisms, there have been many changes within NSF and, especially in the last two years, greatly improved communication between agency divisions.

Rosemary Haggett concurred that relationships between divisions are strengthening. She especially noted that the Mathematics and Physical Sciences (MPS) division has been working with their advisory committees, including holding joint advisory committee meetings for the last two years, with overlapping sessions to discuss important interdisciplinary issues. Dr. Wu reiterated that EHR needs to make a special effort to incorporate people who have been critical of its past policies. As an example of a Math and Science Partnership (MSP) project with a neutral stance about pedagogy, Ms. Ferrini-Mundy described a project working with teachers in 60 districts on developing their mathematical competence so as to focus on curricular coherence. Dr. Schmid noted that several years ago he had become aware that criticisms of EHR were unwelcome, so he was pleased to hear that this is changing. Ms. Olsen noted that with NSF's constantly changing workforce, where half the staff are visiting researchers from universities or teachers who come in for specific periods, change has been on-going, and she strongly supports and invites it.

ACADEMIC COMPETITIVENESS COUNCIL (ACC)

Tom Luce, of the U.S. Department of Education spoke about the Academic Competitiveness Council (ACC). He noted that it was created by the 2006 Deficit Reduction Act and charged with identifying all federal programs with a math and science focus, identifying the target populations to be served, determining the effectiveness of the programs, the areas of overlap, and recommending ways to efficiently integrate and coordinate such programs. A final report is due to Congress next February.

Thirteen agencies regularly participate in the Council. The Office of Management and Budget (OMB) has compiled an inventory of programs and spending in the Science, Technology, Engineering and Math (STEM) area. Of the $3.2 billion in expenditures identified, the largest percentage is in the post-secondary area. The amounts being spent on K-8 math and science hardly register across the federal government.

The number one goal of the Council is to establish common metrics across agency lines so that Congress, OMB and the public can determine the effectiveness of various agencies' programs. For the programs covered by the $3.2 billion, 115 evaluations have been submitted to the ACC. Only 26 of the 115 are Randomized Control Trials (RCTs) and high quality impact evaluations. Of the 26, only five show that there was a meaningful and positive impact. Mr. Luce noted that, with a small-dollar project, there might be insufficient funding to conduct an RCT.

Very little of the $3.2 billion in expenditures is devoted to the K-12 area, reflecting the state of STEM spending today. But the implementation of the common metrics will enable better accountability of the effectiveness of programs. Those for which the metrics, for example, show no impact over time could be candidates for consolidation or for program changes.

Dr. Reyna asked if the means to perform more RCTs could be provided in the future. Mr. Luce responded that the initial evaluation exercise has caused OMB to look at the entire evaluation spectrum with an eye to strengthening evaluation requirements and funding. The Council has shared its preliminary findings with Congress, and both the House and Senate committees have expressed interest in the allocation of dollars by agency.

Dr. Fennell asked if, since the MSP work at the Department of Education is tracking with that at NSF, any kind of an analysis of impact would be available. Mr. Luce said there has not been a concentrated effort in any agency to make sure that there is proper dissemination of lessons learned (i.e., research results are not being communicated to schools, let alone to classroom teachers).

Dr. Whitehurst noted that the expensive portion of evaluations is the data collection. But well-designed evaluations can be conducted on small-scale projects. Mr. Luce observed that No Child Left Behind is resulting in more data becoming available.

TEXTBOOK PUBLISHERS

Vern Williams, moderator of the textbook publishers panel, posed four questions to each publishing house: 1) What is the role of authors in your program? 2) Why have textbooks increased so greatly in size over the past ten years? 3) Describe the importance of proficiency with basic facts and algorithms in your program; 4) To what extent are you influenced by NCTM standards?

Jim Reynolds, representing the Harcourt Education Group, stated that the group's author teams are composed of professors of mathematics, of mathematics education, and of special education, as well as classroom teachers and supervisors. While the nature of author involvement might vary with different publications, for all programs, the authors write and/or review several drafts. Classroom teachers review every grade level and participate in field tests of publication programs as well.

With regard to the increasing size of textbooks, Mr. Reynolds states that a major cause is the increasing depth of instruction. Also, states request that all of their standards be addressed, and multiple state standards can cover quite a range of standards and materials at a given grade level. With regard to proficiency in the use of algorithms, students reach proficiency at different rates, and textbooks over the years have addressed this challenge with different approaches. Today's blended approach focuses on building conceptual understanding by helping students understand how algorithms were developed, how and why they work, and why they are useful.

With the advent of No Child Left Behind (NCLB), state assessments have become increasingly influential. Most states embody the NCTM standards, so incorporating these is crucial.

Cindy Orrell, from Houghton, Mifflin & Company, noted that their authors include university mathematicians, university math educators and supervisors for curriculum or assessment in high performing school districts. The authors guide the philosophy, the pedagogy, and the instructional sequence of the books. They also review all stages of revision and proof in the publishing process.

Several factors influence textbook length, especially the diversity of standards among the states. Books must provide materials for students with different levels of preparedness and ability. Features include back-to-school units, challenge units, and extra pages for review and practice all

add length. Finally, there is an increasing amount of visual representation. Illustrations, photographs, as well as multiple visual, verbal and symbolic materials add pages.

While attention to proficiency with basic facts has remained relatively steady, what has changed is where the facts are learned by rote, through models of manipulatives or student reasoning. State standards increasingly call for students to understand how algorithms work, rather than memorizing them.

Finally, the influence of NCTM standards and state requirements all affect the content being taught, the grade level at which it is presented, and how it is taught. In fact, state standards, which had relatively little impact in the early 90s, now eclipse national influences.

Wendy Spiegel, representing Pearson Education, noted that the role of the authors is central to its publishing programs. They participate at every stage of program development, including planning and revision. Three factors have influenced the growth in textbook size; first is the growth in divergent and increasingly state-specific standards, second is the continual review of topics from grade to grade, and third is the expressed customer need for support for diverse student populations, such as English language learners and advanced learners.

While the importance of proficiency with algorithms has changed little over the years, a particularly notable change has been the increasing migration of a number of algebraic concepts to pre-algebra courses, especially in grades 6-8. This includes solving one-variable equations and inequalities and using variables not only as placeholders but to represent relationships among varying quantities. With state standards diverging, none of these and numerous other pre-algebra materials can be omitted from preparatory texts.

While state curricula and NCTM standards significantly influence textbook development, market forces including emerging pedagogical influences such as Singapore Math play a role in continuous striving for improvement.

Darlene Leshnock**,** representing McGraw-Hill, said that authors and editorial staff determine the philosophies of the programs, the contents, and the instructional designs, as well as reviewing the edited manuscript. As to length, she cited the same causes as did previous speakers (i.e., meeting state standards and the requirements of NCLB). She noted that attaining proficiency with basic facts and algorithms is the definition of first-year algebra. Textbook influences include the NCTM standards and the preferences of teachers in different school districts who use different approaches.

Marcy Baughman, representing Pearson, responded that her company tries to target one or two significant research-based changes in a new revision. The focus is on changes that improve student achievement and RCTs are used in judging revisions. Bill Wilkinson, from Harcourt Achieve, explained a similar approach. In addition, Marcy Baughman stated that all of Pearson's research designs are based on the standards recommended by the What Works Clearinghouse.

Bill Wilkinson noted that the level of sensitivity required to evaluate changes in a publishing program would require far larger staff commitments than are generally available, compelling publishers to focus evaluations primarily at the program level.

Stewart Wood, of Pearson Prentice-Hall, noted that the company publishes multiple editions, built from the same base, to address specific large-state, large-volume purchaser requirements. A national edition would have to address these, plus major open territory states. Dr. Fennell said that the What Works Clearinghouse reports regularly on what has been acceptable in research, particularly at the middle school level

Cathie Dillender, of Pearson, Scott, Foresman, described her experience in publishing a third-grade text for California. Meeting that state's standards resulted in a 539-page book. A 748-page national edition covered all state standards. It is her belief that a focused national curriculum would lead to smaller books.

Lila Nissen, of Holt, Rinehart and Winston, noted that the publisher does provide guidelines, but that most of the time teachers teach to their own state standards. A teacher is not expected to teach the entire text in one year. The content is provided but not prescribed.

Dr. Faulkner asked, since all of the publishers cite state standards as the most important influence on textbook content and length, whether it would be necessary to have the NCTM's recommended Focal Points first adopted by states in order to be incorporated into textbooks. Dr. Fennell noted that the What Works Clearinghouse could serve as a source of information on what is generally accepted.

Dr. Wu noted that mathematical errors occur far too frequently in too many American textbooks. He finds that texts from other national programs (e.g., Singapore) contain significantly fewer errors, as well as being smaller.

Dr. Ball asked what research had been done on teachers' use of teacher manuals and how that usage shapes the development of guidance materials. She also asked what research publishers are doing to address the vast range of linguistic and cultural diversity among U.S. students and to support teachers' efforts to address this problem. Ms. Baughman said that her efficacy studies require that the teachers use the manual every day to ensure a rigorous implementation of the program. Despite the range of materials and guidance given in the manuals, questions constantly arise because individual teachers are always seeking specific extra material.

Dr. Loveless offered another explanation for the increasing length of textbooks. He noted that there are topics in current books that were not covered in the depth that is now offered. He also noted that today's books have many more photos, pictures, and non-mathematical content such as stories. All this leads to a bloating that is not found in books from other nations. Ms. Trow commented that books are longer less because of non-mathematical content than because of the level of competency and comfort of teachers. The books are inclusive so that it is not left to chance that the teachers have the mathematical background and communication skills to convey content adequately.

The morning session concluded with thanks to the panelists and a request from Dr. Faulkner that the panel members focus on the questions and issues that will be most valuable in preparing the Advisory Committee's final report. The session adjourned at 12:14 p.m.

I certify the accuracy of these minutes.

Chair's Signature _____ Date _____

Vice Chair's Signature _____ Date _____

ADDENDUM: PUBLIC PARTICIPANTS

Last Name	**First Name**	**Organization**

Last Name	First Name	Organization
Allen	Angela	Public Schools of Brookline
Alves	Michelle	Digi-Block
Bailey	Rebecca	The Algebra Project
Barnes	Betty	Carnegie Learning
Baughman	Marcy	Pearson Education
Beckmann	Sybilla	University of Georgia
Beers	Jack	Metropolitan Teaching and Learning Company
Bickerton	Bob	Massachusetts Department of Education
Birch	Emily Michie	Heinemann Math and Science Greenwood Heinemann Publishing
Bisk Ph.D.	Richard	Worcester State College
Blaunstein	Phyllis	Widmeyer Communications
Bradley	John	NSF
Buell	Nancy H	Association of Teachers of Mathematics in Massachusetts
Burke	Laurie W.	Cambium Learning
Chapin	Suzanne	Boston University
Chen, Ph.D.	Andrew	EduTron Corporation
Christiansen, Dr.	Per	Massachusetts Department of Education, Student Assessment Services
Clements	Douglas H.	University At Buffalo, State University Of New York
Collins, Ph.D.	Anne	Association of Teachers of Mathematics in New England (ATMNE)
Concannon	Holly	Murphy School, Boston Public Schools
Connell	Michael	Dartmouth College
Crotti	Patti	California Comprehensive Center at WestEd
Crouch, III	Cecil	PA Training and Technical Assistance Network
Davenport	Linda	Boston Public Schools
Dieffenbach	Jeff	Wayland School Committee
Dillender	Cathie	Pearson Scott Foresman

Last Name	First Name	Organization
Dockterman	David	Tom Snyder Productions and Harvard Graduate School of Education
Driscoll, Ph.D.	Mark J.	EDC, Inc. (representing TODOS and NCSM per Miriam Leiva and Linda Gojak)
Eich	Mary	Newton Public Schools
Fernald	Wayne	Student Assessment Services, Massachusetts Department of Education
Ferrini-Mundy	Joan	NSF
Ficca	Tracy	Pennsylvania Department of Education
Findell	Carol	Boston University
Findlen	Sean	Weber Shandwick
Finkel	Stacey	Widmeyer Communications
Fitzgerald	Ted	Boston Herald
Flanagan, Ph.D.	Kristin	Education Statistics Services Institute
Flattau, PhD	Pamela Ebert	IDA Science and Technology Policy Institute, Social and Behavioral Sciences and Education
Fortmann	Thomas E., Dr.	Mass Insight Education
Fraser	Alison L.	Mass Insight Education
Freeman	Haley	Student Assessment Services, Massachusetts Department of Education
Freeman	Haley	MA Dept of Education
Garfunkel	Solomon	Consortium for Mathematics and its applications (COMAP)
Gendler	Joel	Victory Productions
Ginsburg	Herbert	Columbia University Teachers College and Wireless Generation
Godfrey	Lynne	Cambridge Public Schools Kennedy/Longfellow School, Room 201
Greenes	Carole	Boston University
Halber	Deborah	MIT
Hamada	Lori	Sacramento County Office of Education
Hechinge	John	Wall Street Journal

Last Name	First Name	Organization
Helon	Margaret	Wayland
Hoang	Cvong	Philanthropic Advisors
Horrigan	Holly	Mathematician and Parent
Howard	Phillip	Independent
Hughes	Dr. Anne O.	Retired - University of the District of Columbia
Jackson	Neelia	Boston Public Schools
Jan	Tracy	Boston Globe
Johnson	Mark	Student Assessment Services, Massachusetts Department of Education
Johnston	George L.	EduTron Corporation
Judson	Thomas	Harvard University
Kalinowski	Melissa	PLATO Learning
Kastner	Marcia	Student Assessment Services, Massachusetts Department of Education
Keller	Zoe	TERC
Khatri	Dr. Daryao S.	University of the District of Columbia
Klugerman, Dr.	Michael	Mass Insight Education
Knowles	Marianne	Great Source Education Group (a division of Houghton-Mifflin)
Kra	Irwin	Math for America
Krehbiel	Ken	National Council of Teachers of Mathematics
Lamb	Todd	Dutko Worldwide
LeBron	Hunter	Young People's Project
Lehnertz	Elizabeth	Pearson Prentice Hall
Leshnock	Darlene	McGraw-Hill Glencoe
Littlewood	Susan	Victory Productions
Long	Donna J.	Macmillan/McGraw-Hill
Lucas, Jr.	Harry	Educational Advancement Foundation
Madsen	Grace	Samuel Adams School Boston Public

Last Name	First Name	Organization
Martinek	Larry	Mathnasium
Martinez	Alina	Abt Associates Inc.
Mayer	Ken	TERC
McCarron	Kari	MIT Washington Office
McKelvey	Lynda	Sopris West Educational Services
McLaughlin	Nancy	Cambridge Public Schools
Milner	Chad	Young People's Project
Milner	Khari	CPSD
Mitchell	Nyema	IDA Science and Technology Policy Institute, Social and Behavioral Sciences and Education
Mitchell	Sally	Syracuse University- School of Education
Moynihan, M.Ed.	Benjamin	Algebra Project Inc.
Nissen	Lila	Holt, Rinehart and Winston
Ocken	Stanley	Department of Mathematics, The City College of C. U. N. Y.
O'Hearn	Jane	US Department of Education
O'Reilly	Fran	Abt Associates
Orrell	Cindy J.	Houghton Mifflin Company
Owen, Dr.	Lisa	Rhode Island College
Page	Maurice	Wheelock College
Park	Frederick	Cambridge Public Schools
Peck	Ann	WGBH
Penfold	Angela Noll	RMC Research Corporation
Peresman	Claudia	Wright Group - McGraw Hill
Personnat	Egbert	MA Dept of Education
Pettigrew	Joan	Independent Consultant
Pittock	Janet	Scholastic
Porras	Victoria	Victory Productions

Last Name	First Name	Organization
Porzio	Joseph	Math Resource Center
Reynolds	Jim	Harcourt School Publishers
Richmond	Margie H.	Pearson Learning Group
Rickhoff	Rick	SRA/McGraw-Hill Companies
Roebke	Joshua	Seed Media Group
Rogalski	Susan	Great Source Education Group
Rosenberg	Steven	Boston University
Russell	Susan Jo	Education Research Collaborative, TERC
Saxberg	Bror	K12, Inc.
Schielack, Dr.	Jane F.	Texas A&M University
Schmitt	Mary Jane	Adult Numeracy Network
Shein-Gerson	Debbie	Weston Public Schools
Simons	Jeanne	MA Dept of Education
Spiegel	Wendy	Pearson Education
Szaniszlo	Marie	Boston Herald
Trow	Marilyn	Director, Math Product Management, Harcourt Achieve
Tsankova, Dr.	Jenny	ATMIM, Association of Teachers of Mathematics in Massachusetts
Umphrey	Lee C.	Math for America
Van Wassenhove	Doug	McDougal Littell/Houghton Mifflin Company
Waight, Ed. D.	Mary M.	Independent
Ward	Julie	Cambridge Public Schools
Weidevaar	Jeff	Pearson Education
Wendorf	James H.	National Center for Learning Disabilities
West	Mary	Lesley University
Whiting	David	McGraw-Hill
Wilkinson	Bill	Harcourt Achieve

Last Name	First Name	Organization
Willis, Ph.D.	Christine E.	Cambium Learning, Inc.
Wontan	Karen	Community and Family Engagement Training Center, Boston Public Schools
Wood	Stewart	Pearson Prentice Hall
Zeno	Barbara	Math Resource Center