U.S. DEPARTMENT OF EDUCATION
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NATIONAL MATHEMATICS ADVISORY PANEL MEETING
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THURSDAY,
JUNE 29, 2006
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SUMMARY
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CAROLINA INN, PITTSBORO STREET
CHAPEL HILL, NORTH CAROLINA
1:00 PM
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PANEL AND EX OFFICIO MEMBERS PRESENT:

LARRY R. FAULKNER	Chair
CAMILLA BENBOW	Vice Chair
DEBORAH LOEWENBERG BALL	Member
A. WADE BOYKIN	Member
FRANCIS FENNELL	Member
DAVID GEARY	Member
RUSSELL GERSTEN	Member
TOM LOVELESS	Member
LIPING MA	Member
VALERIE REYNA	Member
WILFRIED SCHMID	Member
ROBERT SIEGLER (PRESENT VIA CONFERENCE PHONE)	Member
SANDRA STOTSKY	Member
VERN WILLIAMS	Member
HUNG-HSI WU	Member
DAN BERCH (PRESENT VIA CONFERENCE PHONE)	Ex Officio Member
DIANE JONES	Ex Officio Member
GROVER WHITEHURST	Ex Officio Member

PANEL AND EX OFFICIO MEMBERS NOT PRESENT:

NANCY ICHINAGA	Member
JIM SIMONS	Member
TOM LUCE	Ex Officio Member
KATHIE OLSEN	Ex Officio Member
RAY SIMON	Ex Officio Member

STAFF MEMBERS PRESENT:

TYRRELL FLAWN	Executive Director
DIANE MCCAULEY	
IDA EBLINGER KELLEY	
JENNIFER GRABAN	
ALYSON KNAPP	

PUBLIC COMMENT

Ben Klein, Dolan Professor of Mathematics at Davidson College, read the testimony of James E. Schultz, the Robert L. Morton Professor Emeritus of Mathematics Education at Ohio University. Professor Schultz made several observations to the Panel. First, he observed that collaborations such as the work of the Panel are needed to address the challenges of mathematics education. Second, he said that many mathematics educators today are placing too much emphasis on the teaching of facts. Third, he said that placing too much emphasis on algebra draws attention away from the teaching of probability and statistics, which has significant practical applications. Fourth, Dr. Schultz observed that the U.S. rural population is often overlooked when educational changes are proposed. Fifth, technology that supports computation, enhances concept learning, and provides new approaches to problem solving is now readily available and could impact the way that students are taught to manipulate algebraic expressions, solve equations, and find derivatives and integrals. Dr. Schultz also observed that students are taught to manipulate symbols for fractions, algebraic expressions, and derivatives with virtually no understanding of the underlying concepts and how to apply them. Professor Schultz then made several recommendations to the Panel. First, he recommended that they find a balance between the skills approach and the concepts approach to teaching mathematics. Second, he recommended that they find a way to appropriately integrate emerging technologies into the teaching of mathematical skills and concepts. Third, they should not let the curricula for college-bound students in science and engineering drive the curricula for all students. Fourth, although sound mathematics should prevail at all times, this does not mean that differences in the ways in which students learn should be ignored. Finally, he recommended that the Panel endorse a broad curriculum that includes the teaching of exponential functions and probability and statistics. They should also call for a wide range of assessment practices that align with this curriculum.

Bror Saxberg is the Chief Learning Officer for K12 Inc., a company that develops textbooks, online materials, and teacher-training materials. Dr. Saxberg commented on how clarity regarding the foundations of math learning affects those who create support materials in mathematics. He stressed the point that there is a gap between the cognitive science of learning and practitioners in schools by comparing the world of education to the world of medicine, in which a relatively strong link exists between science and practice. In contrast, teachers, school administrators, and textbook committees are not informed about relevant learning science. This is because there is little motivation in the market to take successful learning science to full-scale implementation. Educators are often suspicious of randomized controlled trials, and it is difficult to aggregate learning outcomes because each state defines its own measures. Also, many practitioners treat symptoms rather than underlying problems. Effective tools are necessary to achieve better results in math education. Randomized trials must be conducted, and practitioners, decision makers, and buyers must use the underlying learning science. For these reasons, K12 welcomes the efforts of the Panel to articulate the key guideposts to research about math education and will assist the Panel however it can.

Miriam Leiva, Distinguished Professor Emeritus of the Mathematics Department at the University of North Carolina, thanked the Panel for its efforts, which will impact millions of students and teachers. Dr. Leiva is also the President of TODOS: Mathematics for All, which advocates for an equitable, high quality, rigorous mathematics education for all students, particularly those who are on the wrong side of the achievement gap. Because of time limitations, Dr. Leiva focused her remarks on the process by which students of various abilities and backgrounds learn mathematics. Because all students deserve equal access to a high-quality mathematics education, accommodations must be made to suit the needs of a diverse population.

This is particularly important when teaching problem solving skills, an area of particularly low achievement among students in the United States. However, because of its real-world application, it is also one of the most important areas of learning. Dr. Leiva submitted copies of her full remarks and recommendations to the Panel members, along with bibliographical citations.

Kenneth W. Humphrey read the comments of Jack Fretwell, President and owner of Starboard Training Systems in Reston, Virginia. Mr. Fretwell's comments focused on the benefits of using computer technology to assist math students in completing their homework. Students often have difficulty in successfully completing their homework due to uncertainty and frustration. A traditional solution to this problem is to provide a tutor, who can relieve a student's frustration by breaking down problems into simpler steps and concepts, and by providing encouragement and feedback. Software can provide many of the same benefits. It is instructionally efficient and engaging. It also presents material in smaller, more understandable increments, and can provide immediate feedback. These benefits mean greater success, and less frustration. In summary, Mr. Fretwell envisions curriculum related software that teachers may assign as an alternative to traditional homework. Introducing this software can begin quickly, and effectiveness is easily tested. Finally, the software would somewhat reduce the need for teachers with strong math backgrounds.

Anne Catlla read the comments of Cathy Kessel on behalf of the Association for Women in Mathematics. The Association's purpose is to encourage women and girls to study and have active careers in mathematical sciences and to promote equal treatment of women and girls in mathematical sciences. The Association is concerned that only seven women sit on the National Mathematics Advisory Panel, and that the Panel's Vice Chair, Camilla Benbow, has hypothesized that there are inevitable gender differences in favor of males at the highest levels of mathematics performance. The Association argues that, if this hypothesis is correct, then the gender imbalance in mathematical ability should remain roughly constant over time. However, the evidence does not support this. On the contrary, the male to female ratio of Hopkins Talent Search participants with scores over 700 has declined significantly since Benbow and Stanley first used these statistics to support their hypothesis in 1983. Therefore, the Association hopes that the National Mathematics Advisory Panel will debunk the myth about mathematical ability and its relationship to gender.

Janie Zimmer spoke on behalf of the National Council of Supervisors of Mathematics, an organization for leaders in mathematics education. Ms. Zimmer addressed three critical needs in mathematics education and the future of the United States in the global society. One, there is a need for equity. Two, there is a need to deepen the content knowledge of teachers, particularly at the elementary and middle school levels. Three, current research-based mathematics programs must be given more time to provide continued evidence. With regard to the first issue, the Panel must find a way to ensure that all students, regardless of cultural, economic, physical, motivational or intellectual challenges, reach high levels of mathematical achievement. With regard to the second issue, NCSM has a major focus on providing professional development to teachers. In providing professional development, NCSM believes that mathematics content should be the focus, and that elements of evidence-based effective pedagogy should be provided within that framework. This will give teachers an understanding of both the mathematics content, as well as effective strategies for teaching it.

Mike Maggart, a former high school teacher and the founder and CEO of Classmate Math, spoke about his experience working in the field of technology in math education, specifically in the area of individualized instruction through interactive audio and video. He also highlighted the importance of recent advancements in content delivery that have the potential to

revolutionize the math-education system. Ten years ago, while working as a math teacher at a high school in Houston, Texas, Mr. Maggart first turned to technology to provide his students with the kind of unlimited individualized instruction that he could never provide on his own. Instead of writing a textbook for the printed page, he wrote a textbook for the computer. This allowed him to "put a teacher inside of the book," since each sample problem provides a video of a teacher presenting the problem at a whiteboard at the click of a button. After a decade of development, the program now includes over 400 lessons covering Pre-Algebra through Algebra 2, and is used by hundreds of schools throughout the country. During the 2003-2004 school year, Project Grad conducted a study of the Classmate Math model. This study showed a significant increase in performance among a sample of Houston Algebra I students on the Stanford Achievement Test after using Classmate Math for a year. This fall, Prince George's County Public Schools in Maryland will be implementing the Classmate Math program with 7,500 of its lowest-performing algebra students. Since the speed of the Internet in most schools has finally improved to the point where audio and video content can be delivered online, other schools may soon follow. Another advancement in technology that has revolutionized the world of individualized instruction is the video IPOD, which increases the deliverability of the Classmate Math program. Mr. Maggart concluded by saying that technology has finally evolved to the point where a highly qualified teacher can be delivered to every student on demand. He encouraged Panel members to view demo lessons from the program on a video IPOD. Dr. Loveless asked Mr. Maggart how he had selected teachers for the videos. Mr. Maggart replied that the videos feature three teachers: himself, and two younger teachers who have between five and ten years of experience and have a great deal of energy.

Linda Alsop, a classroom teacher from Flemington, New Jersey, commented on two problems in today's mathematics classroom experience, the recognition of which has influenced her approach to instruction. The first problem is a lack of understanding among math students of parts in relation to wholes. The second problem relates to the time constraints of classroom teaching. With regard to the first problem, Ms. Alsop said that she had noticed that her 4^{th} and 5^{th} grade students have difficulties with fractions and addition as a result of a failure to understand parts in relation to wholes. Because this understanding is the foundation of all mathematical learning, it needs to be made a focus of early childhood programs. With regard to the second problem, Ms. Alsop said that the scope and depth of mathematical understanding could not be attained in 180 hours per year, which is the maximum amount of time that a typical elementary math teacher spends with his students. Ms. Alsop then outlined several practices that have worked well in her classes. The first is to invite confusion as a necessary part of a lesson. The second is to conduct individual interviews after each assessment. The third is to use well thought-out plans, such as games, songs, interactive technology, and small group instruction, to highlight open math problems that directly correlate with standards.

Karen Norwood, Associate Professor of Mathematics Education at North Carolina State University, spoke on behalf of the Benjamin Banneker Association, of which she is president. Dr. Norwood called the Panel's attention to two recent national summit experiences that resulted in the reframing of the multi-dimensional nature of black student achievement. The Outcomes in Mathematics Summit was organized by the National Association of Black School Educators in conjunction with the Benjamin Banneker Association, and was held in Washington, DC, in April of 2004. Another NSF-funded initiative was the first annual Research Symposium Optimizing Mathematical Achievement for All Students, organized by the Maryland Institute for Minority Achievement in Education in September of 2004. The conclusion was reached at each of these summits that the optimization of African-American student achievement is hindered by fundamental forces, including faulty notions about African-American students and their

experiences, resistance to equity, confusion about the nature of mathematics and mathematics teaching, and, finally, misinformation and miscommunication among various stakeholders. The need for teachers to question and reform their pedagogies and for research to include a critical social and political inquiry as an essential component of the mathematics reform was also recognized at the Maryland Symposium. As a result, Benjamin Banneker has written an algebra position paper, which can be found on their website. In conclusion, Dr. Norwood said that Benjamin Banneker believes that the National Mathematics Advisory Panel must consider building more research on what has been learned over the last two years regarding the mathematics education of African-American children.

Genevieve Knight, Belk Professor, Fayetteville University, Fayetteville, NC said that the voice of teachers is missing from the Panel's formative discussion phase. This voice is necessary because mathematics research findings alone are not sufficient to determine and guide mathematics education in the pre-K – 12 arena. Therefore, Ms. Knight recommended that a working group composed of mathematics teachers be formed and given a meaningful charge. Also, the professional mathematicians associated with other education-related organizations should be invited to provide input on best practices for the teaching of mathematics, with a special emphasis on algebra.

Randy Harter, K-12 Mathematics Specialist for the Buncombe County Schools in Asheville, North Carolina, stated that instructional practices in the majority of K-8 mathematics classrooms in the United States place a disproportionate emphasis on mathematical procedures as opposed to the development of reasoning and problem solving abilities. He then cited several studies supporting this conclusion, including *Adding It Up,* and *The Common Ground Report*. In England, Jo Boaler conducted a study that reached a similar conclusion. Mr. Harter then told the story of a particular student who, although she had scored in the 76th percentile on the 8th grade end-of-year test for North Carolina, had been unable to solve a simple word problem during a clinical interview. Mr. Harter concluded by stating his belief that problem solving and reasoning abilities must come first in the learning of mathematics and that, with this foundation, computational fluency will follow.

Hyman Bass is a research mathematician from the University of Michigan who specializes in various branches of algebra and who has spent the last several years collaborating with educational researchers at the University of Michigan, focusing mainly on the nature of measurement of mathematical knowledge needed for teaching. Dr. Bass made remarks in three areas: the nature of algebra in school curriculum, the issue of equity and mathematical enrichment, and the Panel's norms for discourse and reasoning. With regard to algebra, Dr. Bass said that it is a gateway subject through which far too many students fail to pass and that these students fall disproportionately into particular ethnic, racial, and socioeconomic groups. Much of the debate regarding possible solutions to this problem centers on an argument about the nature of algebra. The traditional view of algebra emphasizes the systematic use of symbolic notation for variables and functions. The other view of algebra emphasizes the recognition of patterns in sequences of numerical or geometric data. In Dr. Bass' view, it is inappropriate to frame the problem of teaching algebra around this debate, since the two forms of algebra described are separate and equally valid mathematical subject areas. In other words, one cannot replace the other. With regard to equity, Dr. Bass expressed his concern that the Panel's advocacy of special mathematics enrichment programs for gifted students may draw attention away from addressing issues of equity. Finally, with regard to the Panel's norms for discourse and reasoning, Dr. Bass urged the Panel to direct their criticisms to particular documents or actions, rather than to organizations. Also, he requested that any such criticisms be supported by evidence. Dr. Schmid asked Dr. Bass if he could point to any evidence in support of the Investigations curriculum,

which deviates significantly from practices in high-achieving countries. Dr. Bass replied that he has some serious misgivings regarding the early versions of this curriculum, because he feels that it does not place adequate emphasis on the teaching of basic skills. However, he does not feel that national intervention on this matter is appropriate. Dr. Ma asked Dr. Bass if he is aware of any literature that further addresses the relationship between symbolic algebra and algebra as modeling. Dr. Bass replied that extensive literature exists on mathematical modeling, including a soon-to-be released study from the International Commission on Math Instruction. Dr. Williams asked Dr. Bass if he believes that, given an excellent math teacher, blacks, Hispanics, and girls could learn traditional algebra. Dr. Bass replied that, given an excellent math teacher, any student could handle any mathematics.

James R. Fryzinger, a professor at the College of Charleston in Charleston, South Carolina, said that a significant portion of his students are unable to use either a ruler or a protractor, despite having scored an average of 1250 on the SAT. This is indicative of a widespread problem: American school children are not being sufficiently and correctly trained in measurements. This is in part because measurement is being taught as an academic topic, but is not being employed as a common practical tool. Measurement is not a math or science topic; it is a language that transcends disciplinary boundaries. The price paid for imprecise understanding of measurement in our nation's businesses can be severe, since global competition and increased dependence on the economy of scale demand greater precision, and thus greater measurement skills. However, American industry is hampered not only by the quality of measurement training that students are receiving, but also by the type of measurement training that students are receiving. As schools continue to teach both the metric system and the increasingly obsolete system of measurement that is rarely used outside of the United States, time that would be better spent on teaching the metric system alone is wasted on teaching conversion between the two systems. As industry moves towards metrication, the schools should follow. Dr. Fryzinger concluded by saying that the U.S. Department of Education, the National Academies, and other federal entities must send a strong message to oversight organizations for math, English composition, social studies, art and foreign languages regarding the need to train American students to make and properly use metric measurements.

Alden Dunham commented on the continuing shortage of highly qualified classroom teachers in our country, and proposed that this problem be solved through the use of distance learning technologies. He said that this solution would be both cheaper and more effective than the President's proposal. However, it is also highly controversial. He recommended that North Carolina take the lead on this project, and said that, sooner or later, advances in technology will make current educational practices obsolete. He concluded by saying that future research in education will be tied to dramatic breakthroughs in neuroscience, decreasing reliance on the less rigorous social and behavioral sciences.

Donald Burdick, a Senior Scientist with MetaMetrics Corporation, described his experiences in volunteering at Lakewood Elementary School subsequent to his retirement from Duke University. Once a week, he gives a one-hour lesson to a class of third and fourth graders at the elementary school, which generally involves dividing the class into teams for competition in math games. Although they have no experimental results to support their opinion, both he and the classroom teacher feel that this activity is an effective teaching method. Dr. Burdick then asked the Panel if other competitions of this sort are taking place around the country, and if so, how he can access information on them. He also expressed his belief in the potential of his generation to assist in the teaching of today's students. In order to do this, however, inter-generational barriers of terminology must first be overcome. Dr. Loveless suggested that Dr. Burdick look into a program developed by Robert Slavin at Johns Hopkins University called

Games, Teams, Tournaments.

Iris Weiss, the President of Horizon Research, Incorporated, expressed her hope that the Panel will make recommendations to improve its evidentiary base. In particular, she urged the Panel to go beyond developing criteria for judging the qualities of individual studies, to describing its overall vision for an evidentiary base. A much better educational research system will be required to generate the knowledge needed to make steady improvement. However, Ms. Weiss also cautioned the Panel against conducting rigorous research in the absence of proper forethought and design. For example, demonstrating that a program that could not possibly work does, in fact, not work, is not an effective use of taxpayers' money. Instead, the Panel must add to the knowledge base in a deliberate, systematic, and efficient manner. Ms. Weiss then made several recommendations as to how this could be done. First, more research should be focused on problems of practice and policy. Second, more money should be dedicated to research. Third, a greater effort must be made to develop valid measures of the dependent and mediating variables that are hypothesized as being in play. Finally, more attention needs to be directed towards addressing school and district concerns about research. This is because, although schools are increasingly being asked to use effective research-based practices, the pressure to meet adequate field progress leaves them little time for conducting research. Dr. Loveless asked Ms. Weiss to name a particular area of policy or practice that has a need for additional research. Ms. Weiss said that more research should be conducted on the effective use of professional development money. Dr. Reyna asked how one can evaluate the manner in which professional development money is being spent if one does not know on what it is being spent. Ms. Weiss replied that, in order to address this question, the goal of professional development must first be specified. Dr. Fennell asked Ms. Weiss if she would recommend a specific examination of the Math-Science Partnership Initiative. Ms. Weiss replied that she would. She also said that it is difficult to aggregate knowledge since every study uses its own measures. Also, many studies are not conducted for long enough periods of time to produce usable results. Dr. Fennell said that he had asked his question because of the demise of the Eisenhower program, which happened in part because no systematic evaluation of the program was ever conducted. He hopes that they can avoid falling into this error again in dealing with math-science partnerships at the state level. Ms. Jones asked where and how evaluators are introduced into the process, and if Ms. Weiss had any recommendations on this matter. Specifically, she asked Ms. Weiss if she thought it would be helpful to bring evaluators in on the front end of projects, and if so, how the agencies that fund this kind of research could better integrate input from evaluators. Ms. Weiss replied that it is useful to bring in evaluators at the very beginning of projects in order to critique the design of these projects. However, she is not entirely convinced that the summit of evaluation should be conducted by someone who was hired by the project, since someone who was hired by the project may also be fired by the project. Ms. Jones asked if it is more practical to involve evaluators at the project or at the program level. Ms. Weiss replied that it is important to conduct both a program and a project evaluation. Dr. Loveless asked Ms. Weiss how to make the connection between professional development and student outcomes. Ms. Weiss replied that the Federal government has some leverage on this issue, although resistance among school districts to the use of randomized field trials continues to be a problem.

Robert Young, a Professor of Industrial Engineering at North Carolina State, said that, according to statistics from the U.S. Department of Labor, the need for engineers and business people in this country is growing at a tremendous rate, while the need for mathematicians is stable and relatively low. In spite of this, the majority of high-school math textbooks are written by and for mathematicians, causing many students to wonder how mathematics applies to their lives. The rationale for learning mathematics exists at engineering

and business schools around the country, but is not being used to design textbooks. Therefore, Dr. Young recommended that the Panel work towards creating incentives to encourage colleges of education, business, and engineering to pool their expertise and write textbooks that explain the real world applications of mathematical principles.

Susan Friel, a curriculum developer and Professor of Mathematics Education at UNC Chapel Hill, commented on some developments in the area of early childhood education. First, she said that, although certain statistical and algebraic skills are being pushed down to elementary school levels, this is often being done in the absence of any clear idea of how this will help to build the children's understanding. However, studies exist showing how certain skills can help to build algebraic understanding in younger children. For example, one research study featured in the latest Journal for Research in Mathematics Education (JRME) article shows that understanding the equal sign makes a difference in understanding algebra. This is also one of the concepts that Carpenter and his group have focused on in their work on K-5. In addition, some other work is being developed through case studies that look at algebraic reasoning in the middle grades. Dr. Friel provided the Panel members with copies of a one-page document listing possible case-study references. She also provided them with a two-page bibliography of childhood mathematics literature that ought to be reviewed. She then said that more emphasis should be placed on identifying content areas that are foundational to essential conceptual understandings and on applying the teaching of these content areas to elementary curricula. She then highlighted the work done by Wright and his group from New Zealand and Australia, as well as some Dutch materials. Dr. Friel suggested that the Panel articulate trajectories that address both content, and the development of learning. She then stressed the importance of pushing the mathematical agenda, and of teaching mathematics in a purposeful manner. Dr. Friel also recommended that the Panel consider characterizing contents and concepts that are necessary to learn by examining tasks and sequences of tasks, since different tasks will provoke different levels and kinds of mathematical thinking. She then highlighted an Algebra I process approach program, developed in Hawaii, in which the design and sequence of tasks were grounded in a research project looking at curriculum development. Dr. Ma asked Dr. Friel what she means by algebraic reasoning as opposed to other forms of reasoning. Dr. Friel replied that algebraic reasoning involves the ability to make generalizations.

Sid Rachlin, President of the Association of Mathematics Teacher Educators, commented that the previous day's discussion on the nature of research had focused too much on studies as individual pieces, rather than as parts of a larger body of knowledge. He also said that the issue of retention of skills had been missing from the previous day's discussion. Dr. Loveless asked if a rigorous evaluation of the Hawaii process approach program had been conducted, and if so, what the results had been. Mr. Rachlin replied that the Hawaii Algebra Project had been built on a series of video interviews that had been conducted with the aim of looking at how students think when they are doing algebra. The study was poorly designed in that, while white students were randomly selected for participation, all available black students were included. Based on this selection of students, the study showed that the algebraic thinking processes of black and white students are equivalent. Several evaluations of the program have been conducted at different locations. One of these evaluations found that, following completion of the program, the 9^{th} grade black male students and 9^{th} grade white male students tested within 3 to 5 percentage points of one another on the end-of-grade test for the Hawaii Algebra classes. In contrast, a difference of 25 to 30 percent existed between these two populations following the completion of other programs.

Johanna Maynard, a mathematics teacher and an American Indian of the Lumbee Tribe from Robeson County, North Carolina, said that the achievement gap is an issue of

great concern to her. Because of her concern in this area, she has spent the past five years studying how students learn mathematics and implementing two different mathematics curricula. One is the traditional curriculum, which has been used in classrooms across America for years. The other is a standards-based curriculum, which focuses on the understanding and application of mathematics, rather than on memorization. She said that all students do not learn in the same way and that traditional methods of teaching mathematics favor the few over the many. This should not be. Ms. Maynard then said that the use of standards-based curricula could help to solve this problem by making mathematics accessible to a greater number of students and offered statistics from her high school in Durham to support this claim. Enrollment in upper level math courses has increased by 61 percent since the 2000-2001 school year. Also, 91.5 percent of these students are now receiving college credit. In contrast, only 74 of students were receiving college credit before the first group of students had completed the four-year cycle of the standards-based curriculum. In conclusion, she said that, although the way in which mathematics is taught is only one variable in mathematics education, and although the work that she has done is specific to only one school, such small scale efforts should at least cause mathematics educators to consider examining how and what mathematics is being taught across the nation. Dr. Jones asked Ms. Maynard which curricula were being used in the traditional setting, and which curricula were being used in the standards-based setting. Ms. Maynard replied that the traditional curricula are based on Prentice-Hall, while the standards-based curricula are based on Sims and Core-Plus, among others. Dr. Reyna encouraged Ms. Maynard to provide the Panel with information on the number of students selected for the standards-based curricula, the manner in which they were selected, the nature of the measure, and what, specifically, was being compared. This information will help the Panel to understand the implications of the results.

Nana Anoa Nantambu, Director of Neighborhood Math Place, Inc. in Durham, NC, told the story of the organization that strove to foster more positive results in the mathematics education of African-American children. From 1992 to 1996, the Neighborhood Math Place (NMP) Center provided opportunities for mathematics learning and teaching for students and teachers alike, including workshops designed to foster a more positive attitude regarding one's ability to do mathematics, ACT college entrance exam preparation workshops, and activities designed to raise community awareness regarding the need for mathematics education reform. In 1996, the NMP ceased to exist due to a combination of factors, including lack of outside funding, the absence of a business plan for development, and Ms. Nantambu's resistance to charging service fees consistent with the market rate. She then said that similar community-based programs are operating throughout the country and are producing positive results. However, like NMP in its time, these programs are not linked to any university, local or state initiatives that could potentially help them to produce the scientific evidence necessary to assess their efforts. Therefore, Ms. Nantambu recommended that the Panel make an effort to identify successful community-based programs that operate below the radar, as well as recommend that such programs be financially supported to enhance the quality of their programming and to produce the scientific evidence that might encourage replication of their success. Dr. Jones said that the Helping America's Youth Program is working to develop effective, low-cost evaluation methodologies that can be employed by community-based programs.

I certify the accuracy of these minutes.

Chair's Signature _____ Date _____

Vice Chair's Signature _____ Date _____

ADDENDUM: PUBLIC PARTICIPANTS

Last Name	First Name	Organization
Alsop	Danielle	Flemington/Raritan School District
Alsop	Linda	Flemington/Raritan School District
Bass	Hyman	University of Michigan
Baughman	Marcy	Pearson Education
Bourland	Lu Anne	Voyager Expanded Learning
Broadway	Everly	NC Department of Public Instruction
Burdick	Don	Metametrics Corp
Burg	Samantha	Metametrics Corp
Catlla	Anne	Association for Women in Mathematics
Ciason	Rebecca	Walter M. Williams High School
Crawford	Ann R., Dr.	Independent Consultant
Davis	C. E.	North Carolina Department of Public Instruction
Duckhorn	Patricia	Sacramento County Office of Education
Dunham	Alden	Carnegie Corporation of New York
Friel	Dr. Susan	UNC-Chapel Hill, School of Education
Frysinger	James R.	University/College of Charleston
Guckian	Lisa	James B. Hunt, Jr. Institute
Harter	Randy	Buncombe County Schools
Holoman, Ph.D.	Verna L.	The University of North Carolina
Humphrey	Florita	Independent
Humphrey	Kenneth	Independent
James	Thomas, Dr.	UNC Chapel Hill, School of Education
Jobrack	Beverlee	SRA/McGraw-Hill
Kimball	Robert	Independent
Klein	Rosemary	TODOS
Klein	Benjamin	Davidson College
Klimko	Jennifer	Metametrics Corp

Last Name	First Name	Organization
Knight	Genevieve	Fayettevile State University
Kohlberg	Gavi	Digi-Block, Inc.
Kulka	Richard	Abt Associates Inc.
Leiva, Ph.D.	Miriam A.	President, TODOS: Mathematics for All
Maggart	Mike	Classmate Math
Malloy, Ph.D.	Carol E.	University of North Carolina at Chapel Hill
Maynor	Johannah	Durham Public Schools/NCCU
Moeser	James	UNC Chapel Hill
Munn	Geraldine, Dr.	Fayetteville State University
Murray	Elizabeth	North Carolina Department of Public Instruction
Nantambu	Nana Anoa	Neighborhood Math Place, Inc.
Norwood	Karen	The Benjamin Banneker Association, Inc.
Pantula	Sastry G.	Department of Statistics, North Carolina State University
Pittock	Janet	Scholastic
Rachlin	Sid	The Association of Mathematics Teacher Educators
Rall	Ashley	Independent
Rowlett, Ph.D.	Russ	UNC Center for Mathematics and Science Education
Saxberg	Bror, M.D., Ph.D.	K12, Inc.
Schneider	Tuck	North Carolina State University
Singer	Michael	North Carolina State University
Slattery	Dennis	Pearson Prentice Hall
Sztajn	Paola	National Science Foundation
Weiss	Iris	Horizon Research, Inc.
Wilkinson	Bill	Harcourt Achieve
Young	Robert	North Carolina State University
Zimmer	Janie L.	NCSM