



STEM Smart: Lessons Learned From Successful Schools

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PRESENTER & SYNTHESIZER BIOGRAPHICAL INFORMATION

Elaine Allensworth is interim director at the University of Chicago Consortium on Chicago School Research. Currently, through a Bill and Melinda Gates Foundation grant, she is examining what it means to be on a path to be ready for college during the middle grades, and how students' achievement in the middle grades interacts with their experiences in high school to affect post-secondary success. She is also conducting a study of online algebra credit recovery funded by the Institute of Education Sciences at the U.S. Department of Education. Allensworth, a former high school Spanish and science teacher, is best known for her research on early indicators of high school graduation, college readiness, and the transition from middle to high school. Her work on early indicators of high school graduation has been adopted for tracking systems used in Chicago and other districts across the country, and is the basis for a tool developed by the National High School Center. She is one of the authors of the book, *Organizing Schools for Improvement: Lessons from Chicago*, which provides a detailed analysis of school practices and community conditions that promote school improvement. Allensworth has received a number of awards from the American Educational Research Association for outstanding publications, including the Palmer O. Johnson award and Division H awards for Outstanding Instructional Research and Planning, Policy and Management Research. She has served on several committees for the National Academies, is a standing member of the Scientific Review Panel of the U.S. Department of Education, and was on the board of the Illinois Education Research Council. Allensworth holds a PhD in Sociology, and an MA in Urban Studies/Sociology from Michigan State University.

Brett Block is a graduate of the Institute for Chemistry Literacy through Computational Science (ICLCS), is working on her National Board Certification in science, and currently teaches chemistry and advanced chemistry at Paris High School in Paris, IL. She has taught biology, physics, and chemistry at Casey-Westfield High School, teaching high school science for fifteen years. Brett strives to incorporate computational chemistry programs in her curricula to enhance student learning and visualization of chemistry and molecular modeling, and to help her students become champions of science. She graduated from the University of Illinois with a bachelor's degree in biological science and received her teaching certificate and master's degree in natural science from Eastern Illinois University.

Audrey Borling is currently the dean of instruction at UIC College Prep. Previously, Borling was a national recruitment director for Teach for America. She taught reading, math, and science at a Chicago International Charter School. Borling helped co-write the UIC College Prep health science curriculum, which incorporates problem-based learning; content related to dentistry, nursing, applied health science, medicine, pharmacy, social work, and public health; and interpretation of data and scientific inquiry. Through consultations with Illinois Mathematics and Science Academy, the Noble Network, DeBakey High School, and UIC, the health science program has continued to grow and push students'

critical thinking skills and exposure to health science professions. Borling earned a BS from Indiana University and an MAT from Dominican University.

Andrew Bruening is a founding teacher, lead science teacher, and co-dean of students at Metro Early College High School. Bruening has taught environmental science, engineering, senior research, and robotics at Metro's Learning Center at Center of Science and Industry. He is faculty advisor and coach for Metro's FIRST Robotics team (Metrobots) and has mentored several teams to the National Society of Black Engineers Regional and National Lego Robotics Championships. His innovative experiential techniques demonstrate his enjoyment of teaching and have provided students with mastery level concepts and ideas. He believes in involving students in research as much as possible and works to incorporate his own research experiences into the classroom. He has taught at the high school and college levels, including high school physics and Earth science classes from 1998 to 2001 and laboratory and undergraduate courses while a graduate student at University of South Carolina. Bruening has assisted in delivering the Garbology project to more than 1,500 students in central Ohio in conjunction with the PAST Foundation, Solid Waste Association of Central Ohio, and Metro High School. He has also presented at several regional and national STEM conferences. Bruening serves on the Board of Trustees of the PAST Foundation and is a founding board member of the Central Ohio Robotics Initiative (CORI). He also serves as a manuscript reviewer for the educational journal *Theory Into Practice*. Bruening holds a bachelor's degree in marine geology from Eckerd College and a PhD in Geology from the University of South Carolina.

Traci Buckner is the instructional leader at the National Inventors Hall of Fame® School...Center for STEM Learning. Under her leadership, the National Inventors Hall of Fame School has been featured in *Newsweek* and on Anderson Cooper 360 in an educational segment from Perry's Principles. Buckner has most recently spoken at Hathaway Brown's Innovation Summit and 21st Century Design Symposium on the topic of teaching creativity in a collaborative space and the What Matters & What Counts in Education series in Denver, Colorado. Before beginning her career in the Akron Public School System, Buckner worked as a marketing and sales representative. Upon completing her master's degree in education from John Carroll University, Buckner went to work in a language arts classroom at Innes Middle School. She served as dean of students at Innes and assistant principal at Litchfield and Perkins middle schools, and principal at Riedinger Middle School. Buckner has served on several district committees including the School Climate Committee, the Local Professional Development Committee, the Educational Management Information System team, and the Standards and Appraisal Committee. She also represented the district at local and national conferences, presenting recently on strategies for strengthening intra-school-system collaboration. In addition to her master's degree, Buckner holds a BA in Communication with an emphasis on marketing from The Ohio State University and an Instructional Leadership Administrative Certificate from Ashland University.

Nancy Butler Songer is a member of the faculty of the School of Education at the University of Michigan. In addition, Songer is director of the Center for Essential Science at the University of Michigan, and principal investigator of the Deep Think and Climate Change Biology research groups. Her work challenges American students' underperformance in science that emerges between the fourth and eighth grades through the development and evaluation of technology, curriculum units, assessment instruments, and learning progressions focused on students' complex understandings of current science topics. Songer was awarded a Presidential Faculty Fellowship from President William J. Clinton in 1996 and elected a Fellow of the American Association for the Advancement of Science. Songer has a PhD in science education from the University of California, Berkeley; an MS in Molecular/Developmental Biology from Tufts University; and a BS in Biological Sciences from the University of California, Davis.

Rebecca Canty is currently superintendent of A-C Central CUSD #262 in Ashland, Ill., and the co-principal investigator and K–12 partnership lead of the Institute for Chemistry Literacy through Computational Science (ICLCS). She is vice president of the Illinois Women in Educational Leadership and received the prestigious Caterpillar Quality Award for one of her projects. Canty also taught in a school that received a U.S. Department of Education Secretary’s national award for outstanding vocational/technical education. She has published in the *American Association of School Administrators* and has been invited to serve on the National Association of Secondary Principals’ national committee. Canty has led her district to a One-to-One Computer Laptop Initiative and has seen significant growth, particularly in the high school, which was selected last year as one of the Top 100 High Schools in the state by the *Chicago Sun Times*. Canty holds a BS in English, Speech, and Theater from Bradley University and an MS from Illinois State University in educational administration.

Jeanne Century is the director of science education and research & evaluation at the University of Chicago’s Center for Elementary Mathematics and Science Education (CEMSE). Century has spent the majority of her career working in and with urban schools and large urban school districts across the country. She has developed comprehensive science instructional materials and been part of professional development, technical assistance, and strategic planning efforts for teachers and school and district administrators across the country. Her research and evaluation efforts have focused on the impact of inquiry science instruction, strategies for improving utilization of research and evaluation, sustainability of reform, and measurement of fidelity and enactment of innovations. Century served on the transition team for the Obama-Biden administration where she focused on STEM education and education R&D and recently shared the National Association for Research in Science Teaching award for the most significant publication of 2010. Century’s current work includes an examination of implementation, spread, and sustainability of inclusive STEM middle and high schools in Ohio. Her work includes identifying key elements of STEM school models and measuring the extent to which those elements are enacted in practice. It also focuses on measuring and analyzing the range of factors that affect implementation as well as the impact those factors have on model spread and sustainability. The next step of this work is examining relationships between model components and student outcomes. Her group is committed to developing an open research environment and shares this and other work in progress on <http://www.researcherswithoutborders.org>. Century holds a K–8 teaching certificate, an undergraduate degree in general science, and a master’s and doctorate in science education curriculum and teaching.

Margo Corona De Ley has more than twenty years of experience in education as a teacher, curriculum developer, and administrator at the pre-school, elementary, university, and adult levels. Her experience includes her current work in the Office of Access and Enrollment at Chicago Public Schools, and earlier positions at the University of Illinois at the Chicago (UIC) and Urbana-Champaign campuses, Illinois State University, and elementary schools in Champaign, Illinois, and San Bernardino, California. She has worked since 1994 building the capacity of nonprofit organizations and communities as a program officer at The Chicago Community Trust, as a consultant to nonprofits and foundations, and as an online adjunct instructor in UIC’s Certificate in Nonprofit Management program. Over the past four years at Chicago Public Schools, De Ley has forged partnerships and helped raised funds for the district’s STEM elementary program partners, including a three-year National Science Foundation grant for the Chicago Pre-College Science and Engineering Program. De Ley has a BA, MA, and PhD from the University of Illinois at Urbana-Champaign in Spanish literature.

Thom Dunning, Jr. is the director of the National Center for Supercomputing Applications, as well as a professor and Distinguished Chair for Research Excellence in Chemistry at the University of Illinois at Urbana-Champaign. He is currently working on the creation of a national cyberinfrastructure to support research and education in science and engineering, with a focus on high performance computing, and is using modern theoretical concepts and computational simulations to enhance the teaching of chemistry from high school to the undergraduate classroom. Dunning was a post-doctoral fellow at both the California Institute of Technology and Battelle Memorial Institute. He then took a position at Los Alamos National Laboratory in the Laser Theory Group and then in the Physical Chemistry Group. Dunning was appointed group leader of the Theoretical and Computational Chemistry Group at Argonne National Laboratory in 1978. Beginning in 1989, Dunning held many positions at the Pacific Northwest National Laboratory, becoming director of the Environmental Molecular Sciences Laboratory in 1994 and the first Battelle Fellow in 1997. He spent two years (1999–2001) in the Office of Science of the U.S. Department of Energy as assistant director for scientific simulation, where he was responsible for developing a new scientific computing program. Dunning then went to the University of North Carolina at Chapel Hill as a professor of chemistry and was responsible for their supercomputing and networking system. In 2002, he was appointed Director of the Joint Institute for Computational Sciences, Distinguished Professor of Chemistry and Chemical Engineering at the University of Tennessee, and Distinguished Scientist in Computing and Computational Sciences at Oak Ridge National Laboratory. Dunning is the recipient of many awards, including E. O. Lawrence Award in Chemistry, U.S. Department of Energy; Distinguished Associate Award, U.S. Department of Energy; Computers in Chemical and Pharmaceutical Research Award, American Chemical Society; Fellow of the American Chemical Society, American Physical Society and American Association for the Advancement of Science; and Thomson Reuters “Highly Cited Researcher” Award. Dunning received his BS in Chemistry from the Missouri University of Science and Technology and his PhD in Chemistry/Chemical Physics from the California Institute of Technology.

Janice Earle currently serves as coordinator for the Directorate for Education and Human Resources’ program evaluation activities at the National Science Foundation (NSF). She is also responsible for a Foundation-wide activity on K-12 STEM education. She has been at the NSF since 1991 and has worked with several of the Foundation’s education programs. Previously Earle served as the cluster lead for the Research and Evaluation on Education in Science and Engineering (REESE) and CAREER programs housed in the Division of Research on Learning in Formal and Informal Settings. Earle works with several of the agency’s policy oriented efforts such as those with the National Academy of Sciences National Research Council, and the U.S. Department of Education. Earle received a BA in history from the University of Michigan, a MA from Teachers College, Columbia University, and a PhD in education policy and planning from the University of Maryland.

Cheryl Farmer is the founding program manager and project director of UTeachEngineering. Funded through the National Science Foundation, UTeachEngineering offers a well-designed, well-rounded, design-based high school engineering course that can be implemented at low cost in virtually any setting, as well as a variety of professional development programs for pre-service and in-service teachers who want to add engineering to their teaching portfolios. Farmer’s work in higher education includes the development and launch of an academic enrichment and mentorship program for university freshmen and the direction of a university-based teacher professional development program for primary teachers seeking to integrate science and mathematics instruction through engineering-inspired applications. Before entering higher education, Farmer worked as a project manager in the environmental field. Farmer was a recipient of the Dodd Teaching Excellence Award from the Department of Mathematics at The University of Texas at Austin. Her education includes graduate work

in mathematics and business administration, and a BA in Mathematics and Liberal Arts, with highest honors, from The University of Texas at Austin.

Joan Ferrini-Mundy is assistant director of the National Science Foundation's (NSF) Directorate for Education and Human Resources, a position she has held since February 2011. Ferrini-Mundy is responsible for setting the vision and establishing the mission of its Directorate for Education and Human Resources (EHR), whose budget in FY2010 was more than \$800 million with a staff of more than 150 people. She serves as a member of the NSF senior management team and is involved in strategic planning and direction for the scientific and education mission of the NSF. Ferrini-Mundy's current activities include a government-wide performance management effort; a leadership role in defining NSF's budget priorities for FY 2013; and an ongoing collaboration with the White House Office of Science and Technology Policy in developing a government-wide strategic plan for science, technology, engineering, and mathematics (STEM) education and workforce development. From 2007 through January 2011, she was an NSF member of the National Science and Technology Council's (NSTC) Subcommittee on Education of the Committee on Science, and currently serves on two task forces of the new NSTC Committee on STEM Education. Ferrini-Mundy is currently a member of the Mathematics Expert Group of the Programme for International Student Assessment (PISA). In 2007–2008, representing the NSF, she served as an ex-officio member of the President's National Mathematics Advisory Panel. She has served on the Board of Directors of the National Council of Teachers of Mathematics (NCTM), and served on the Board of Governors of the Mathematical Association of America. Ferrini-Mundy holds a PhD in Mathematics Education from the University of New Hampshire. Ferrini-Mundy holds an appointment at Michigan State University (MSU) as a University Distinguished Professor of Mathematics Education in the Departments of Mathematics and Teacher Education.

Bradford Findell provides consulting services in mathematics education, focusing in particular on the implementation of the Common Core State Standards. He was a member of the Mathematics Work Team for the Common Core State Standards and is past president of the Association of State Supervisors of Mathematics. Previously, Findell was the mathematics initiatives administrator at the Ohio Department of Education, providing mathematics education leadership and bringing Ohio's best work onto the national stage. Before moving to Ohio, he was on the mathematics education faculty at the University of Georgia, where he became deeply involved in drafting, revising, elaborating, and implementing the Georgia Performance Standards in mathematics. He has also served as a staff member at the National Research Council, working on various mathematics education projects, including *Adding It Up: Helping Children Learn Mathematics*, a synthesis of the research literature on the teaching and learning of mathematics in grades K–8. He has taught mathematics courses and lessons in elementary through graduate school, focusing mostly on high school and undergraduate mathematics and on the preparation and professional development of teachers.

Martin Gartzman is executive director of the Center for Elementary Mathematics and Science Education at the University of Chicago. From 2006 to 2010, he served as assistant vice chancellor and executive director for high school development at the University of Illinois at Chicago (UIC), where he coordinated the university's work with UIC College Prep, a charter high school established in 2008 in partnership with the Noble Street Charter School. As a faculty associate at UIC's Learning Sciences Research Institute since 2006, Gartzman has established several funded projects. In 2007, he brought together a team of leading researchers, developers, and practitioners to establish the Algebra Intensification Project, which led to the development of Agile Mind's *Intensified Algebra I*; from 2007 to 2010, Gartzman served as the project's principal investigator. In 2009, he founded and served as principal investigator of two "sister initiatives"—the West Cook Mathematics Initiative and the South Cook Mathematics Initiative—which

are working with 33 school districts in west and south Cook County to develop regionally based mathematics improvement strategies. From 2006 to 2010, with Susan Hull and Uri Treisman of the Charles A. Dana Center of the University of Texas at Austin, he co-directed the Dana Center's Urban Mathematics Leadership Network, a network of mathematics directors from 22 of the country's largest school districts. From 2002 to 2006, Gartzman served as the CPS chief mathematics and science officer, where he developed and directed the Chicago Math and Science Initiative (CMSI), the district's highly touted program for mathematics and science improvement. From 1986 to 2002, he served in several capacities at UIC, including twelve years as associate director of UIC's Institute for Mathematics and Science Education, which Gartzman co-founded with mathematician Philip Wagreich and physicist Howard Goldberg in 1990. He has developed and served in senior leadership capacities with many grant-funded projects involving mathematics and science curriculum development and teacher professional development, and has served in advisory roles with many projects and organizations. From 1978 to 1986, Gartzman taught biology and directed the bilingual program at Benito Juarez High School in Chicago.

David Grissmer is currently a research professor at the Center for Advanced Study of Teaching and Learning (CASTL) at the University of Virginia's Curry School of Education. Previously, he was a senior management scientist at RAND Corporation for twenty-seven years, where his focus was using quantitative techniques from statistics, econometrics, operations research and actuarial science to analyze public policy problems. He currently has research grants from the NSF, NICHD and IES. His current research focuses on the developmental origins and evolution of achievement score gaps using empirical evidence from the Early Childhood Longitudinal Survey of Kindergarteners and a Birth Cohort (ECLS-K and ECLS-B) to test hypotheses about early developmental and academic predictors of much later achievement at 8th grade. The results from this analysis suggesting that early fine motor skills is as strong a predictor as executive function measures for later math led to an NICHD-funded experimental intervention testing whether improvements in fine motor skills would improve developmental and academic measures, including executive function and math. Another finding using the ECLS-K and ECLS-B suggests that an early general knowledge measure is the strongest predictor of 8th grade reading and science. This finding partly led to an IES-funded lottery-based RCT evaluating the *Core Knowledge* curriculum, which is based on the premise that early general knowledge is critical for later achievement. The work has also involved linking evidence from neuroscience that might suggest the causal mechanisms involved in the links between early developmental and academic measures and later cognitive performance. Grissmer holds a PhD in Physics from Purdue University.

Lisa Guerra works within The University of Texas at Austin Cockrell School of Engineering on an Intergovernmental Personnel Act (IPA) assignment first to develop a systems engineering curriculum in the Aerospace Engineering Department and then, over this past year, to infuse the UTeachEngineering program with those same elements of systems engineering and NASA design challenges for a high school offering. As part of the UTeachEngineering effort, Guerra is developing an engineer-mentor program to enable high school teachers to teach engineering design. Guerra also serves as a faculty sponsor for WIALD (Women in Aerospace Leadership and Development) club started last year. Guerra started her career at Eagle Engineering Corporation in Houston focusing on conceptual design of advanced spacecraft for human missions to the Moon and Mars. Guerra continued working on space exploration-oriented assignments at SAIC (Science Applications International Corporation) in support of NASA's Johnson Space Center. Guerra has over twenty years of experience in the NASA aerospace community. Guerra's most recent position at NASA Headquarters was acting director of the Directorate Integration Office in the Exploration Systems Mission Directorate. At NASA, Guerra has also worked in the Exploration Systems Mission Directorate as special assistant to the associate administrator,

managed the Decadal Planning Team, and spent three years at the Goddard Space Flight Center as program integration manager for the James Webb Space Telescope. She was also an initial member of the NASA Independent Program Analysis Office. Guerra is a contributing author to the McGraw-Hill textbook, *Human Spaceflight: Mission Analysis and Design*. Guerra earned a BS in Aerospace Engineering and a BA in English from the University of Notre Dame. She received an MS in Aerospace Engineering from the University of Texas at Austin.

Kenneth Hill is currently the president and CEO of the Chicago Pre-College Science and Engineering Program, Inc. Hill worked at MichCon and taught in the Detroit Public School System prior to moving to the Republic of Zambia in Central Africa, where he taught calculus and physics to African high school students. Upon his return to Detroit, he developed a nationally renowned program known as DAPCEP (Detroit Area Pre-College Engineering Program). In 1976, DAPCEP began with 245 students and now has an enrollment of over 6,000. The mission is to increase the number of underrepresented African American, Latino American, and Native American students who are motivated and prepared to pursue careers in science, mathematics, and engineering. DAPCEP provides instructional and motivational activities to youngsters throughout the school year, on Saturdays, and during the summer. Hill led the development of the DAPCEP curriculum and put into place an effective teacher-training component. DAPCEP students continue to win gold ribbon awards in the Metropolitan Detroit Science and Engineering Fair, with forty-four percent of the winners in 2003 compared with ten percent in 1977. Hill was the recipient of the 1990 NAACP Distinguished Service Award, the 1993 Distinguished Service Award from the Detroit Public Schools, the Community Service Award from the DAPCEP Parent Advisory Committee, and 1995 "Best Managed Non-Profit" from Crain's Detroit's Business. He was selected Michiganiaan of the Year in 1999. In 2000, Hill was the recipient of the William L. Dawson award from the Congressional Black Caucus Foundation. In 2002, he received a community service award from the Ford African Ancestry Network, and in 2004, he received the Jaramogi Abebe Agyeman Award from the Black Slate, Eastside Slate, and the Community Coalition. He is a graduate of Howard University with a BS in Civil Engineering and Wayne State University with an MA in Mathematics Education.

Megan Hopkins is a postdoctoral research fellow in the School of Education and Social Policy at Northwestern University. She works with Dr. James Spillane on the NSF-funded NebraskaMATH Project, a longitudinal study that examines the impact of the project's professional development program in mathematics on teacher practices, attitudes, and leadership, with an overall goal of improving achievement in mathematics and narrowing achievement gaps for struggling students. In her other work, Hopkins investigates teachers' implementation of language policy and the ways in which schools and classrooms are organized to meet the needs of English language learners and immigrant students. Prior to moving to Northwestern, Hopkins was the evaluation research associate for Project Secondary Online Learning (SOL) at the Civil Rights Project/Proyecto Derechos Civiles, a bi-national initiative that delivers rigorous primary language math and science curricula to recent immigrant high school students. She is a former bilingual elementary school teacher and has also worked as a supervisor and instructor for pre-service and novice teachers in Los Angeles. Hopkins was awarded the 2011 Dissertation of the Year Award (second place) from the Bilingual Education Research Special Interest Group of the American Educational Research Association. She serves as the coordinator for the Working Group on ELL Policy, a group of nationally recognized researchers in the education of English language learners. Hopkins received her PhD in education from UCLA's Graduate School of Education and Information Studies, and she holds a MEd in International Education Policy from the Harvard Graduate School of Education and a BA in Spanish from Indiana University.

Lon Kaufman is the chief academic and operating officer for the University of Illinois at Chicago. He is professor of biological sciences and adjunct professor of bioengineering. Kaufman, who started at UIC in 1985 as an assistant professor, has served previously as head of the department of biological sciences and director of graduate studies. The focus of his research is the regulation of gene expression, signal transduction, and crop productivity. He has published extensively and has patents related to his research. Prior to his appointment as provost, Kaufman was vice provost for planning and programs, guiding the development and assessment of traditional academic programs, online and international education, and pipeline programs. As chief planner for the campus he provided leadership towards many UIC initiatives including Energy and Sustainability, Diversity Strategic Thinking and Planning, Academic Directions, and Campus Master Planning. From 2003 to 2008, Kaufman served as vice provost for undergraduate affairs and dean of the Honors College. While in that role, he was instrumental in redesigning the General Education program, implementing Summer College for incoming freshman, opening two learning centers, securing campus reaccreditation, and dramatically renovating three classroom buildings, bringing them to LEED standards. Kaufman also played a major role in the creation of the UIC College Prep High School, a health science–focused charter school now among the most successful open-enrollment Chicago public schools. He continues his commitment to diversity, social justice, and student success. Kaufman received his PhD in Cell and Developmental Biology from the State University of New York at Stony Brook.

Henry Kepner is a mathematics education professor at the University of Wisconsin-Milwaukee. Kepner was president of the National Council of Teachers of Mathematics from 2008 to 2010. He also served five years as a program officer at the National Science Foundation in Washington, D.C. He was a founding member and first president of the Association of Mathematics Teacher Educators. He has served as president of the National Council of Supervisors of Mathematics, the Wisconsin Mathematics Council, and the Milwaukee Educational Computing Association. He also taught middle and high school mathematics for twelve years in Milwaukee and Iowa City. He served on the Boards of Directors of the National Council of Teachers of Mathematics and the School Science and Mathematics Association. In 2003, Kepner received the School Science and Mathematics Association Distinguished Service Award in recognition of his accomplishments and contributions to mathematics education over the past forty-five years. In 2004, he received the School of Education Teaching Award. He is the 2008 recipient of North Shore United Educators' Award of Excellence. Kepner earned his BS and MS degrees in mathematics and his PhD in Mathematics Education at the University of Iowa.

Karen King is the director of research at the National Council of Teachers of Mathematics (NCTM). At NCTM, King is responsible for research activities that focus on linking mathematics education research and practice. She is also responsible for teacher education projects at NCTM. Prior to working at NCTM, King was an associate professor of mathematics education at New York University's Steinhardt School of Culture Education and Human Development and previously served as a program director at the National Science Foundation (NSF) in the former Division of Elementary, Secondary, and Informal Education, where she managed projects primarily in the Teacher Professional Continuum (TPC) Program. She also oversaw curriculum projects in Instructional Materials Development (IMD) and policy for the Education and Human Resources Directorate. She recently has been the principal investigator of two NSF-funded research grants focusing on (1) understanding the mathematical preparation of future secondary teachers and (2) how teachers use innovative middle school mathematics materials and their impact on student learning. As part of the latter grant, she served on the partnership working group of CADRE, which produced reports on educational research and development partnerships for both researchers and practitioners. She was also co-principal investigator of an NSF-funded Noyce Fellowship grant housed at NYU. King previously served as the associate editor of the *Journal for Research in*

Mathematics Education and as a member of the Research Committee of NCTM. She was a member of the RAND Mathematics Study Panel, which made recommendations to the Department of Education about future research funding in mathematics education. She has served on numerous committees focusing on research in mathematics education and teacher education with national organizations, including the Association of Mathematics Teacher Educators and the National Board for Professional Teaching Standards. She completed a five-year term on the Board of Directors for the Federal City Public Service Foundation, where she has served as Recording Secretary and Treasurer. King received her PhD at the University of Maryland, where she conducted research on undergraduate mathematics teacher thinking.

Michael Lach is the director of STEM Policy and Strategic Initiatives, Urban Education Institute and Center for Elementary Mathematics and Science Education (CEMSE), University of Chicago. Previously, Lach was special assistant for Science, Technology, Engineering and Mathematics Education at the U.S. Department of Education, leading education efforts in those areas. Lach also worked as an officer of teaching and learning for Chicago Public Schools, overseeing curriculum and instruction in the nation's third largest school district. Lach began his professional career teaching high school biology and general science in New Orleans in 1990 as a charter member of Teach for America; he later joined the national office of Teach for America as director of program design. He has served as an Albert Einstein Distinguished Educator Fellow, advising Rep. Vernon Ehlers (R-Mich.) on science, technology and education issues. He was lead curriculum developer for *the Investigations in Environmental Science* curriculum developed at the Center for Learning Technologies in Urban Schools at Northwestern University. Lach earned a bachelor's degree in physics from Carleton College, and master's degrees from Columbia University and Northeastern Illinois University.

Gabrielle Lyon has over twenty years of experience as an education activist, convener, and nonprofit leader. As the co-founder of Project Exploration, Lyon designed, built, and managed programs, raised funds, and earned revenue strategies for the \$2 million, twenty-person, nonprofit science education organization from the ground up. She established Project Exploration's nationally recognized model for recruiting and retaining minority youth and girls to science. In addition, Lyon created and managed annual programming that reaches 250+ minority youth and girls with intensive youth programs, thirty teachers annually with professional development workshops, 40,000 visitors internationally via online expeditions and Web initiatives, and 1+ million people with traveling science exhibitions. In 1994, Lyon was selected as a Fellow at the Southern Poverty Law Center, where she worked as a writer and researcher for the education magazine *Teaching Tolerance*. In 1996, Lyon returned to Chicago to direct the School Change Institute and serve as the outreach coordinator at the Small Schools Workshop at the University of Illinois at Chicago. Lyon has co-organized two national conferences on science and technology in out-of-school time in conjunction with the Coalition for Science After School (2008, Chicago; 2010 Los Angeles). Lyon's honors include representing the International Association of Educators for World Peace as a delegate to the United Nations in Geneva, Switzerland, addressing the United Nations Subcommittee on Human Rights on "The Prevention of Racism and the Protection of Minorities" in 1995; being recognized as one of "Tomorrow's Leaders Today" by Public Allies in 1999, one of the Community Renewal Society's "35 Under 35" in 2007; and being a recipient of The Chicago Community Trust Fellowship in 2009. Project Exploration received the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring in 2009, and in 2011 was recognized with an "Excellence in Summer Learning Award" from the National Summer Learning Institute. In 2011, *Chicago Magazine* named Lyon a "Chicagoan of the Year." Lyon serves on the boards of the Coalition for Science After School, the Illinois Girls Collaborative, and the Science Makers. She earned her BA and MA in

history from the University of Chicago and received her PhD in Curriculum Studies from the University of Illinois at Chicago.

Jeff Mays is president of the Illinois Business Roundtable, serving in this capacity since joining the organization in 1998. The Illinois Business Roundtable (IBRT) is a voluntary association of sixty-three chief executive officers of Illinois' leading businesses, formed in 1989 to study, make recommendations, and take action on critical public policy issues facing Illinois. Prior to coming to the Illinois Business Roundtable, Mays served as executive vice president of the Illinois State Chamber of Commerce. He also served as special assistant to the Chicago Regional Administrator of the U.S. Department of Housing and Urban Development (HUD) from 1990 to 1992. And prior to HUD, Mays was elected to five terms in the Illinois General Assembly, representing a large portion of West Central Illinois. As state representative, Mays was the minority spokesman of the House Appropriations Committee, and served on the House Labor and Commerce Committee, the Executive Committee, the Transportation Committee, and the Select Committee on Veterans Affairs.

Glenn "Max" McGee is president of the Illinois Mathematics and Science Academy, a residential academy that educates the top math and science students in Illinois and is active in statewide outreach programs. McGee was a member of the Committee on Highly Successful Schools or Programs for K-12 STEM Education that issued the NRC report, *Successful K-12 STEM Education: Identifying Effective Approaches in Science Technology, Engineering, and Mathematics*. McGee is a regular speaker at state and national conferences, and has published several articles and coauthored two books, most recently *The Perfect School*. McGee is a former Illinois State superintendent of education, and has been a teacher, principal, and district superintendent. He also previously served as senior research associate at Northern Illinois University Center for Governmental Studies. In 2009, he led the Academy to receive Intel's "Star Innovator Award" as the top high school in America, and has guided the Academy through a period of significant financial challenges. He continually works for the good of all students and was instrumental in the revision and passage of the new Illinois State Report Card. In addition, McGee collaborates with schools worldwide to bring students and educators together to research, discuss, and design solutions to the most challenging problems facing our world. McGee serves on the board of the Illinois Association of Gifted Children and the Great Books Foundation, the Governor's P-20 Council and the Diversifying Higher Education Faculty in Illinois Board. He is a past chairman and current member of the board of the Golden Apple Foundation. McGee earned a BA in Political Science from Dartmouth College, an MA in Educational Administration from The University of Chicago, and a PhD in Educational Administration from The University of Chicago.

Kevin McLeod is an associate professor in the Department of Mathematical Sciences at the University of Wisconsin-Milwaukee, with interests in differential equations and mathematical physics. Much of his current work focuses on pre-service teacher preparation and in-service teacher professional development. McLeod is co-principal investigator on the NSF MSP project, Milwaukee Mathematics Partnership: Sharing in Leadership for Student Success. McLeod began his career as a professor for the University of Wisconsin-Milwaukee in 1987. Since 2004, he has played an active role in planning the mathematical content for coursework for mathematics teacher leaders in Milwaukee Public Schools. In his role as co-principal investigator of the Milwaukee Mathematics Partnership, he was involved in developing a suite of pre-service courses for elementary mathematics teachers at UWM, and has been PI on additional grants (obtained in partnership with MPS) to offer these courses to in-service teachers. Beginning in 2007, McLeod has served on Wisconsin state committees involved with the redesign of state mathematics standards and, more recently, implementation of the Common Core State Standards in Wisconsin. McLeod received his PhD from the University of Minnesota in 1984.

Diane Miller, an internationally recognized innovator in informal STEM education, is chief educational outreach officer at the St. Louis Science Center. She began her career as a part-time floor assistant at the California Museum of Science and Industry. She went on to become the museum's director of community outreach and to create the Curator Kids Program. She received the Coming Up Taller Award conferred by the President's Committee on the Arts and the Humanities for her work with the YouthALIVE Project. Miller has led the St. Louis Science Center's educational outreach and community engagement functions since 1996. She developed the Youth Exploring Science Program, a four-year, work-based, STEM learning program for teens ages 14–18. Since its founding, the YES Program has grown from fifteen students to more than 300 and is regarded as a prototype of science-based youth development programs. Miller regularly presents conference keynote addresses and publishes articles on youth development and informal science learning. She recently contributed a chapter, "American Museums as a Borderland" to the British book *Learning to Live: Museums, Young People and Education*, garnering an invitation to Buckingham Palace. Other awards and recognitions include 2010 NOYCE Fellow, 2009 Stellar Performance in Education Award from St. Louis American Foundation; Dr. George Washington Carver Distinguished Service Award; 2008 Best Practices Award, Youth Exploring Science Program; and the Roy L. Shafer Leading Edge Award from the Association of Science Technology Centers in recognition of extraordinary accomplishments made in the area of community outreach and after-school programming. Miller holds a BA in English from the California State University at Chico and is currently pursuing a Master's in Museum Studies at the University of Missouri–St Louis.

Babette J. Neuberger serves as the associate dean for academic affairs and director of graduate studies, University of Illinois at Chicago School of Public Health, and oversees all aspects of the Office of Academic Affairs including academic programs, curriculum development, academic grievances, student academic progress, distance learning, and continuing education. These duties include serving as an ex-officio member of the Committee on Educational Programs, the Committee on Academic Progress, and the Academic Strategic Planning Committee. The assistant dean for student affairs also reports to Neuberger. Prior to becoming the associate dean, Neuberger was a clinical associate professor at the UIC School of Public Health. Neuberger holds a BA in Political Science from University of Wisconsin-Madison and a JD from Loyola University.

Steve Parrott is currently the technology and engineering principal consultant for the Illinois State Board of Education (ISBE). His current responsibilities include the review of technology and engineering programs. Parrott is also the grant manager of Perkins and State funding for Chicago Public Schools, as well as Lake and Cook Counties. Parrott has worked on the Illinois Industrial and Technology and Engineering Education Curriculum Revitalization Project, which led Illinois to join the International Technology and Engineering Educators Association's (ITEEA) STEM Center for Teaching and Learning Consortium. Parrott currently serves as advisor to the board of the Technology Education Association of Illinois; serves as the IL corporate member for both SkillsUSA and Technology Student Association (TSA); is the State Leader for Engineering byDesign(TM) and Project Lead the Way; and serves as the National Technology Student Association's Secretary/Treasurer with a Membership of 185,000 students. Parrott is the past president of the State Supervisors for Technology and Engineering Education (SSTEE) and ITEEA's Council for Supervision and Leadership (CSL). Parrott began his professional career as an industrial engineer for Maytag Refrigeration. At Maytag, he discovered that he wanted to pursue his second dream, teaching, and began his ten-year teaching career in industrial and technology education at Lincolnland Technical Education Center (LTEC) and Lincoln Community High School (LCHS). In his last year at LTEC/LCHS, he received the Who's Who Among American Teachers award (2005), TEAI's "Big Thinker" award (2008), ITEEA's Outstanding State Supervisor of the Year (2009), and TEAI's

Administrator of the Year award (2011). Parrott attended Southern Illinois University at Carbondale and received an industrial technology degree. He then received a MS degree from Illinois State University in technical training.

Joan Pasley, senior research associate, Horizon Research, Inc., has been working with Horizon since 1994 on a number of research and evaluation projects, including the evaluation of the Ohio, South Carolina, and New Jersey Statewide Systemic Initiatives, and the standardized evaluation system for NSF's Local Systemic Change through Teacher Enhancement project. Pasley has conducted numerous sessions designed to facilitate the application of research for practitioners at different levels of the system (e.g., state mathematics and science supervisors, leaders of state MSPs, district supervisors and policy makers, principals, and teachers). She has served as the principal investigator of the MSP Knowledge Management and Dissemination project and directs the evaluations of Cyber-enabled Learning project, which is conducting research on how teachers can be supported to effectively use information and communications technologies in instruction, and the Partnership for Systemic Reform, a partnership between the Merck Institute for Science Education and six school districts in New Jersey and Pennsylvania. In addition to teaching science at the high school level, Pasley served as a high school administrator in an urban school district where she gained experience in curriculum development, assessment, and instructional evaluation. Pasley received a bachelor's degree in biology from the University of Cincinnati, a master's degree in educational Administration from Xavier University, and a PhD in Curriculum and Instruction from the University of North Carolina at Chapel Hill. She has had extensive coursework in educational evaluation and curriculum theory and analysis. Pasley has co-authored a number of publications focused on supporting high-quality STEM instruction, including the book, *Mathematics and Science for a Change: How to Design, Implement, and Sustain High-quality Professional Development* (Weiss & Pasley, 2009).

James Pellegrino is a Liberal Arts and Sciences Distinguished Professor, Distinguished Professor of Education, and co-director of Learning Sciences Research Institute at the University of Illinois at Chicago. His work is focused on analyses of STEM learning and instructional environments with the goal of better understanding the nature of student learning and the conditions that enhance deep understanding. He also serves on technical advisory committees (TAC) overseeing major state assessment programs, as well as the four consortia of states funded under the Race to the Top assessment initiative (SBAC, PARCC, DLM, and NCSC). Pellegrino has received multiple grants from the NSF and IES for R&D projects focused on STEM education across K–16, including leadership of a major NSF-funded project to redesign Advanced Placement courses and exams in biology, chemistry, environmental science, and physics. He has also headed several National Academy of Science/National Research Council study committees focused on issues of teaching, learning and assessment. Pellegrino chaired the Study Committee on the Foundations of Assessment and currently chairs the Study Committee on Deeper Learning and 21st Century Skills. He was a member of the Study Committee on Test Design for K–12 Science Achievement; the Study Committee on Science Learning: Games, Simulations and Education; and the Study Committee on Conceptual Framework for New Science Education Standards. He is a Fellow of AERA, a past member of the NRC Board on Testing and Assessment, and an elected member of the National Academy of Education. Pellegrino received his BA from Colgate University and PhD in Experimental and Quantitative Psychology from the University of Colorado.

Brian J. Reiser is professor of learning sciences in the School of Education and Social Policy at Northwestern University. Reiser's research examines how to make scientific practices, such as argumentation, explanation, and modeling, meaningful and effective for classroom teachers and students. This design research investigates the cognitive and social interaction elements of learning

environments supporting scientific practices and design principles for technology-infused curricula that embed science learning in investigations of contextualized data-rich problems. He leads the MoDeLS project (Modeling Designs for Learning Science) to develop an empirically based learning progression for the practice of scientific modeling, and BGuILE (Biology Guided Inquiry Learning Environments), developing software tools for supporting students in analyzing biological data and constructing explanations. Reiser is also on the leadership team for IQWST (Investigating and Questioning our World through Science and Technology), a collaboration with the University of Michigan developing a middle school project-based science curriculum. Reiser was a founding member of the first graduate program in learning sciences, created at Northwestern, and chaired the program from 1993, shortly after its inception, until 2001. He was co-principal investigator in the NSF Center for Curriculum Materials in Science, exploring the design and enactment of science curriculum materials, and served on the National Research Council's panel authoring the report *Taking Science to School* and the editorial boards of *Science Education* and *The Journal of the Learning Sciences*. Reiser holds a BA in Psychology from the University of Pennsylvania, an MA in Psychology from New York University, and a PhD in Cognitive Science from Yale University.

Rafael Rosa is the vice president of education at the Chicago Academy of Sciences and its Peggy Notebaert Nature Museum. The museum serves 1,700 teachers and approximately 70,000 students each year through a variety of programs including on-site field trip workshops, professional development for teachers at the museum and in a school setting, after-school programs at community centers and schools, and internship and volunteer programs for high school students. As a member of the academy and museum's education team for nineteen years, Rosa has been directly engaged in a number of the museum's programs. He led the institution's student and teacher programs, and coordinated the Teenagers Exploring and Explaining Nature and Science (TEENS) program and the Science on the Go! program, an in-classroom professional development program now in its 21st year. Rosa also served as manager of the institution's distance learning efforts and as a science outreach educator. He was appointed director of education at the museum in 2006 and promoted to vice president in 2009. Rosa currently serves as chair of the Museums in the Park Education Committee and co-chair of the Chicago Wilderness Education Committee. He was previously a member of the Illinois State Board of Education Committee on High Quality Teacher Professional Development. Rosa holds a degree in mechanical engineering from Cornell University.

Jason A. Tyszko currently serves as deputy chief of staff of the Illinois Department of Commerce and Economic Opportunity, where he is responsible for coordinating interagency education and workforce development initiatives. Previously, Jason served as a policy advisor to Governor Quinn as a member of the executive committee that directed over ten billion dollars in investments through the American Recovery and Reinvestment Act (ARRA). While in the Office of the Governor, Tyszko was chair of the interagency ARRA Job Training Working Group and was also tasked with developing the Illinois Pathways Initiative, the signature STEM education strategy included in the state's Race to the Top proposal. Tyszko has a BA in Political Science and History from DePaul University and an MA in Social Science from the University of Chicago. Jason also has earned a secondary education teaching certification through courses taken at National-Louis University.

Susan Van Gundy is the associate director for assessment technology at Achieve. Her work focuses on the development of technology strategies and implementation systems for the multistate Partnership for the Assessment of Readiness for College and Careers (PARCC), including issues related to technical architecture, innovative technology-enhanced assessment items, and digital content to support instruction and teacher professional development. Van Gundy is the former director of education and

strategic partnerships for the National Science Digital Library (NSDL), where she provided vision and project leadership for national-scale cyberinfrastructure initiatives, and brokered collaborations among national and state-level stakeholders. She originated the concept of Learning Resource Paradata, which became a foundational concept for the Learning Registry, a U.S. Department of Education and Department of Defense effort launched in collaboration with NSDL to build an exchange system that improves the distribution and accessibility of digital learning content. Susan's early career emphasized informal and authentic learning, including the integration of hands-on pedagogies, citizen-science, and distance learning opportunities into science museum experiences with the Denver Museum of Nature and Science and the Oregon Museum of Science and Industry. Susan is a frequent conference speaker and serves on numerous advisory boards and review committees for organizations focused on educational technology and science education. She holds a B.S. in Geology from Oberlin College and an M.S. in Geosciences from The Pennsylvania State University.

Suzanne Wasson is a retired Detroit Public Schools science administrator. She is currently a K–12 STEM education consultant specializing in K–3 programs and science fair research project preparation. Prior to her retirement from Detroit Public Schools, Wasson served as K–3 and middle school program administrator for the Detroit Area Pre-College Engineering Program and Math/science administrative unit head at John Burroughs Middle School, and she taught science and pre-engineering at Hally Magnet Middle School. Concurrently, Wasson was an adjunct professor of education at Mercy College of Detroit and University of Detroit Mercy and a consultant for the State of Michigan, Detroit Public Schools, the Connecticut Pre-College Engineering Program, the Engineering Society of Detroit, and the University of Michigan Pre-College Engineering Program. She has developed STEM middle school curricula and coordinated the development and implementation of STEM K–3 programs for the Detroit Area Pre-College Engineering Program and the Chicago Pre-College Science and Engineering Program. Wasson is a graduate of Mercy College of Detroit and Wayne State University.

Alison White serves as a grant communications coordinator for The University of Akron and Ohio Stem Learning Network's (OSLN) Akron Hub. In this role, White is responsible for capturing and sharing best practices across the Ohio STEM Learning Network, driving communications, and coordinating public affairs outreach with regional partners and statewide schools. She serves as an OSLN embedded staff member for the greater Akron region based in the National Inventors Hall of Fame® School ... Center for Science, Technology, Engineering and Mathematics (STEM) Learning, a middle school within Akron Public Schools. White's role also includes serving as a liaison between the OSLN Akron Hub's founding partners (Akron Public Schools, Invent Now, The City of Akron, The Greater Akron Chamber/Akron Tomorrow, and The University of Akron) and the Ohio STEM Learning Network to amplify, accelerate, and magnify this partnership's innovative work, which is aimed at building and connecting STEM teaching and learning capacity in regions across Ohio. White previously served as an account executive for Edward Howard, a full-service public relations agency in Cleveland, Ohio. In 2006, White served as an intern in the State of Ohio Governor's Office of Multicultural Affairs and International Relations. White serves on the executive committees for the National Inventors Hall of Fame® School ... Center for STEM Learning, the upcoming Akron STEM High School, and the Ohio STEM Learning Network's Akron Hub. Previously, she served on the Public Relations Society of America-Cleveland Chapter's Scholarship and Student Day Committees, and functioned as a professional advisor to Kent State University public relations students. White holds a BS in Public Relations with a minor in political science from Kent State University. She is set to graduate with her master's degree in higher education administration from the University of Akron in May 2012.

Edee Norman Wiziecki is the director of the Educational Programs at the National Center for Supercomputing Applications. Wiziecki and her staff help bridge the gap between scientific research and education by bringing authentic and near-authentic computational science tools and high performance computing resources to education communities through a wide variety of activities and programs. Since 2007, Wiziecki has led the Institute for Chemistry Literacy through Computational Science (ICLCS), a Math Science Partnership project of the National Science Foundation. Her focus for the past ten years has been in creating virtual professional learning environments to help reduce educator isolation and increase collaboration, peer-to-peer mentoring, and access to advanced tools and vetted materials for the 21st Century. Wiziecki has organized three national workshops on behalf of the NSF to broaden participation in computing (2005, 2006, and 2011) and to support projects using Cyber-Infrastructure for Training, Education, Advancement and Mentoring for the 21st Century Workforce. As a former K-12 science teacher, and science coordinator for curriculum and instruction at a large unit district, Wiziecki has over twenty-five years of experience in providing professional development that infuses new and emerging technologies into existing science classrooms. She served as president of the Illinois Science Teachers Association in 2003-2005, was a member of the Governor's Illinois Rural Affairs Council and director of the ICLCS Robert Noyce Master Teaching project. She was named Outstanding Science Teacher in Illinois by the National Science Foundation and Illinois State University from 1985-1987; recipient of the 2009 Award of Excellence: Outstanding Contribution on behalf of the NCSA Director's Office; and one of two women who received the 2011 Dare to be Great Award given by the Illinois Women in Educational Leadership. She currently serves on the Next Generation Science Standards Illinois review team. Wiziecki has a BS in Life Science, an EdM in Curriculum and Instruction-Science Education, and an Advanced Certificate Degree in Educational Leadership and Organization from the University of Illinois at Urbana-Champaign.

Mindy Wright is the assistant provost at the Ohio State University. She, along with Aimee Kennedy, works to connect Metro Early College STEM High School and Ohio State faculty around early college experiences for Metro students. Previously, Wright worked at the Writing Workshop at Ohio State University from 1982 to 2007 as teacher and eventually director. There, she developed curricula (including two service-learning partnerships with local schools), trained teachers, conducted programmatic research assessment, and taught undergraduate and graduate courses. In 1985, Wright began work with education outreach programs such as the Board of Regents' Early English Composition Assessment Program. In 2006, she established the Office of Community Partnerships to develop strategic partnerships among community organizations and faculty, staff, and students in Ohio State's College of the Arts and Sciences. She also worked with STEM colleagues and Columbus teachers across the state to expand the Breakfast of Science Champions program, which offers hands-on campus visits for middle school students. On campus, Wright serves as a member of the Literacy Studies Executive Committee, the Service Learning Initiative Advisory Committee, ASC Middle Childhood Education Advisory Committee, and the Economic Access Roundtable. Off campus she serves on committees for Children's Hunger Alliance, Columbus Museum of Art, and Columbus Metropolitan Club. Wright has developed and taught three multi-sectioned writing/service-learning courses, one of which is a multi-department project that works with a community literacy program to tutor recent immigrants in reading and writing English. She was one of the finalists for the 2008 Ohio Campus Compact David Hoch Award. Wright is also a member of the 2002 Leadership Columbus class. Wright holds a BA in English and mathematics from Wittenberg University, an MA in English from Brown University, and a PhD in English (rhetoric and composition studies) from The Ohio State University.