

QUANTITATIVE LITERACY ACROSS THE P-16 CURRICULUM

An Expanded Meeting of the Ohio Mathematics and Science Coalition

February 13, 2009

AGENDA

- 9:00 AM Registration
- 9:30 AM Welcome and Introductions
Carol Damian, Ohio Mathematics and Science Coalition
Mark Thresher, Center of Science and Industry Board of Directors
Brad Findell, Ohio Department of Education
William Steenken, Ohio Mathematics and Science Coalition
- 9:50 AM Keynote Address: “Quantitative Literacy: An Imperative for America”
Bernard Madison, University of Arkansas
- 10:50 AM Morning Break and Water-Cooler Conversations
“Which aspects of quantitative literacy seem to be most critical or intriguing?”
- 11:00 AM Business Panel: “Quantitative Literacy from a Workforce Perspective”
Joan Leitzel, Moderator, The Ohio State University
Panelists:
Clement Hamilton, Holden Arboretum
Michael Heil, Ohio Aerospace Institute
Mark Thresher, Nationwide Financial Services
Brad Mitchell, Battelle
Thomas Zachman, Ohio State Bar Foundation
- 12:15 PM Lunch
- 1:00 PM Education Panel: “Quantitative Literacy from an Education Perspective”
George Viebranz, Moderator, Ohio Mathematics and Science Coalition
Panelists:
Honey Kirk, American Mathematical Association of Two-Year Colleges
Greg Foley, Ohio University
Kim Kiehl, Center of Science and Industry
Nicole Luthy, Ohio Resource Center
Tom Rutan, Ohio Department of Education
- 2:00 PM Afternoon Break and Water Cooler Discussions
“How might schools focus on developing quantitatively literate students?”
- 2:10 PM Café Table Conversations and Knowledge Capture
Peggy Kasten
- 2:40 PM Closing Remarks
Bernie Madison
- 3:00 PM Conference Feedback Forms and Evaluation

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Speaker, Panelist, and Moderator Biographical Sketches

WELCOME

- Carol Damian Dr. Carol Damian is a retired chemistry and physics educator, and currently serves as the Chair of the Ohio Mathematics and Science Coalition Executive Board. She received her Bachelor of Science and Master of Arts degrees in chemistry and physics education from The Ohio State University, and her Ph.D. degree from the Cincinnati's Union Graduate School. She worked for four years as a high school science teacher in Licking County, twenty years with Dublin schools, five years at The Ohio State University Eisenhower National Clearinghouse, and four years as the K-12 Science Curriculum Leader for Worthington Schools. Carol is a past President of the Science Education Council of Ohio. She has published more than 20 articles related to science education.
- Mark Thresher Mark Thresher currently serves as the Chair of the COSI Columbus Executive Board. He will also participate in our morning panel. A more extensive biographical sketch is listed further in our program.
- Brad Findell Dr. Bradford Findell is the Mathematics Initiatives Administrator at the Ohio Department of Education. Dr. Findell came to Ohio from the University of Georgia where he was on the faculty in mathematics education. During his time at the University of Georgia, he became deeply involved in drafting, revising, elaborating, and implementing the Georgia Performance Standards in mathematics. Before joining the faculty at Georgia, Dr. Findell was 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 grades 1 through 20, focusing mostly on high school and undergraduate mathematics and on the preparation and professional development of teachers.
- William Steenken Dr. William G. Steenken retired from GE Aviation after 35 years of working on engine-operability technology and development issues for turbojet-powered aircraft. He still consults on a regular basis and is chairman of a national standards committee – Turbine Engine Inlet Flow Distortion. Bill has twenty-two years of elected school board service. He is the current Chair-Elect of the Ohio Mathematics and Science Coalition Executive Board. He also serves as a member of the Ohio Resource Center Executive Committee. Bill has served on the Board of Directors of the National Alliance of State Science and Mathematics Coalitions, and served a three-year appointment to the Mathematical Sciences Education Board of the National Research Council. Bill has served on numerous state policy councils concerned with improving mathematics and science education in Ohio.

KEYNOTE ADDRESS

- Bernard Madison Dr. Bernard Madison is a professor in the Department of Mathematical Sciences at the University of Arkansas. He has served as a principal investigator on more than a dozen research projects conducted for the National Science Foundation and National Research Council. He is regarded as one of the foremost authorities on the topic of quantitative literacy. His extensive work in quantitative literacy research and curriculum development has gathered national and global recognition. He has published in excess of 80 research journal articles, technical briefs, and policy white papers. He co-edited, with Lynn Steen, the 2008 Mathematical Association of America compendium, *Calculation v. Context*, a collection of works that defines numerous and timely issues related to quantitative literacy as one approach to providing students with a stronger

mathematical foundation for a rapidly-changing world. He has given more than 60 state and national presentations that challenge audiences to rethink long held beliefs about mathematics education and its utility for the wide range of students and schools in our nation.

MORNING BUSINESS PANEL

Joan Leitzel

Dr. Joan Leitzel was a Professor of Mathematics at Ohio State for 25 years, and later moved into administration as Associate Provost for Curriculum and Instruction. In 1990 she went to the National Science Foundation as a division director in the Directorate for Education and Human Resources, and later assumed the position of Senior Vice Chancellor for Academic Affairs and Provost at the University of Nebraska Lincoln. In 1996 she became President of the University of New Hampshire, where she served until her retirement in 2002. In 2004, she returned to Ohio to coordinate Ohio's Mathematics Initiatives for the Ohio Department of Education. She has recently returned to Ohio State in the position of Interim Executive Dean and Vice-Provost to lead the university's restructuring of Arts and Sciences. She chaired the Mathematical Sciences Education Board at the National Research Council from 2000-2005. Among her other honors, she has received the Hanover College Distinguished Alumni Award, the Ohio State Award for Distinguished Teaching, the Ohio State Distinguished Service Award, and the University of New Hampshire Pettee Medal.

Michael Heil

Dr. Mike Heil was appointed to the position of President and CEO of the Ohio Aerospace Institute (OAI) in January, 2007. A distinguished engineering graduate from the U.S. Air Force Academy, Michael was commissioned and pursued his master's degree in flight structures at Columbia University on a Guggenheim Fellowship. He later received his doctorate in aerospace engineering from the Air Force Institute of Technology. Previous to joining OAI, Michael had a long and distinguished military career in the United States Air Force, retiring at the rank of Colonel. He has served on the Air Force Institute of Technology faculty as Director, Center for Space Studies and Research. Prior to joining OAI he served as Director of the Air Force Research Laboratory's Propulsion Directorate with responsibilities research facilities both at Wright-Patterson and Edwards Air Force Bases. He has served in two Air Force acquisition centers, four defense laboratories, a test center, a major command staff, the Office of the Secretary of Defense, and on the faculties of the Air Force Academy and Air Force Institute of Technology.

Clement Hamilton

Dr. Clem Hamilton earned his B.S. in Geology at Harvard, and a Ph.D. in Ecology and Evolutionary Biology at Washington University and the Missouri Botanical Garden. He has conducted botanical research in Thailand, Panama, and Chile, as well as the U.S. After serving in a leadership capacity at four university and botanical research centers, Clem returned to Ohio in 2008 to become the President & CEO of The Holden Arboretum, in Kirtland. There he seeks to maximize the Arboretum's contributions toward creating a more livable, diverse, and ecologically sustainable world by promoting the planting and conservation of trees and forests. In what passes for spare time, Clem plays classical and jazz clarinet and saxophone, and conducts research on the historical development of race relations in baseball; in 1998 he won the Robert Peterson Award from the Society of American Baseball Research.

Brad Mitchell

Dr. Brad Mitchell is the Battelle/OSU Director of Science, Technology, Engineering, and Math (STEM) Education and Economic Development Engagement. His three major tasks in this role are to: coordinate investments in STEM education by OSU and Battelle, particularly in the work going on at Metro School and in the redesign of Linden McKinley High School in Columbus; provide leadership in the development of a Research & Development network across Ohio's five new STEM high schools; and to

help clarify and advance a coherent strategic approach to the interrelationship between STEM education and economic development across the state.

Mark Thresher

Mark R. Thresher is president and chief operating officer of Nationwide Financial Services, Inc. He previously served as senior vice president and chief financial officer for Nationwide Financial. He joined Nationwide as vice president and treasurer in 1996. He is a member of the American Institute of Certified Public Accountants, Association of Ohio Life Insurance Companies and he serves on the Financial Services Roundtable. He is a past member of the Board of Directors for the American Council of Life Insurers, currently chairs the Executive Roundtable Committee, and serves on the Retirement & Financial Security Steering Committee. Mark was a Congressional delegate to the 2006 National Summit on Retirement Savings, held in Washington DC. He is also a member and vice-chairman of Otterbein College Board of Trustees where he serves on the investment and advancement committees and chairs the audit committee.

Thomas Zachman

Retired Judge Thomas F. Zachman served the Brown County Court and the Brown County Municipal Court for seventeen years. Having studied at the Culver Academies and Ohio Wesleyan University before earning his law degree from Duke University School of Law, he served during the Vietnam Conflict as a Special Agent for the OSI and an Appellate Review Officer for the 9th Air Force JAG. He is a past President and Life Fellow of the Ohio State Bar Foundation. Tom previously served on the Ohio State Bar Foundation Board of Governors and the Council of Delegates. He was a member of the Supreme Court of Ohio's Advisory Committee on Technology and the Courts, and previously chaired the Infrastructure and Interoperability Subcommittee, tasked with creating technology-related protocols for the future Ohio Courts Network. In 2005, Judge Zachman received the American Bar Association's William R. McMahon Award for significant implementation of technological advances in a court of specialized jurisdiction. He has also been selected as an inaugural charter Fellow of the Advanced Science and Technology Adjudication Resource Project (ASTAR) and serves on the ASTAR National Programs Committee.

AFTERNOON EDUCATION PANEL

George Viebranz

George Viebranz has served since 2004 as Executive Director of the Ohio Mathematics and Science Coalition. Prior to joining OMSC he spent more than 31 years as a teacher and administrator in the Berea (OH) City School District. He earned a bachelor's degree in secondary education, with a major in mathematics, from Kent State University. He earned his master's degree in education from Kent State, and his school administration credentials at Cleveland State University. During his high school teaching career, he was selected from more than 60 nominees to participate in the Visiting Instructor Program, teaching mathematics and technology at Cleveland State University. He has since served as an adjunct faculty member in mathematics education, mathematics curriculum, and educational technology at three Ohio colleges and universities. George has also contributed to numerous regional and state mathematics, science, and technology teacher quality initiatives. Prior to joining OMSC he served for three years as a member and chair of the National Council of Teachers of Mathematics Educational Publications Committee.

Greg Foley

Dr. Greg Foley received B.A. and M.A. degrees in mathematics and a Ph.D. in mathematics education from The University of Texas at Austin. He is the Robert L. Morton Professor of Mathematics Education at Ohio University. Foley has taught elementary arithmetic through graduate-level mathematics, as well as upper division and graduate-level mathematics education classes. He has held full-time faculty positions at North Harris County College, Austin Community College, The Ohio State University, Sam Houston State University, and Appalachian State University, and served as Director of the Liberal Arts and Science Academy and as Senior Scientist for Secondary School

Mathematics Improvement for the Austin Independent School District in Austin, Texas. Dr. Foley has presented over 250 lectures, workshops, and institutes throughout the United States and internationally. He has directed or co-directed more than 40 funded projects totaling some \$5 million, and has published numerous scholarly works and textbooks. Presently active in various learned societies, Foley has served as a member of the Committee on the Mathematical Education of Teachers of the Mathematical Association of America (MAA). In 1998, he received the biennial American Mathematical Association of Two-Year Colleges (AMATYC) Award for Mathematics Excellence, and in 2005, the annual Teachers Teaching with Technology (T³) Leadership Award.

Honey Kirk

Helen (Honey) Kirk is a professor of mathematics at Palo Alto College in San Antonio, Texas where she received teaching excellence awards in 2001 and 2007. She has a Master of Arts in education from Pepperdine University and a Master of Science in mathematics from the University of Texas at San Antonio. As an Army wife for 30 years, Honey had the opportunity to teach all levels of mathematics throughout the United States as well as Germany and Korea. She is now settled in San Antonio and keeps the travel fever alive by attending conferences and workshops, and visiting her grandchild. As a member of the American Mathematical Association of Two-Year Colleges (AMATYC), Honey has been involved with quantitative literacy and reasoning for the past three years as a contributor to the Mathematics Across the Community College Curriculum (MAC³) project. As part of this work she teaches a learning community examining the connections between developmental mathematics and reading.

Kim Kiehl

Dr. Kim Kiehl is currently Senior Vice President and Chief Strategy Officer at COSI. She was previously Associate Professor of Human Development and Family Science and State Extension Specialist at The Ohio State University, Columbus and Curriculum Coordinator for the A. Sophie Rogers Laboratory for Child and Family Studies. She also served as Associate Dean for Academic Programs, College of Human Ecology and has extensive publications in professional journals. Dr. Kiehl originally came to COSI on "special appointment" as Associate Vice President for Early Childhood Education for COSI Columbus on loan from Ohio State. Dr. Kiehl received a Bachelor of Science in 1981, at SUNY Geneseo, in Speech Pathology and Audiology, graduating Magna Cum Laude. The following year she completed her Master's degree at The College of St. Rose, Department of Special Education. Dr. Kiehl received her Ph.D. in Curriculum and Instruction from Penn State University in 1990. She continues to teach at The Ohio State University in the Department of Education and Human Ecology.

Nicole Luthy

Nicole Luthy currently serves as the Assistant Director of the Ohio Resource Center. She began her career in education as a teacher in the Columbus (OH) Public Schools, where she served on curriculum and professional development teams. Before joining ORC, she was a reading and language arts consultant in the Ohio Department of Education with responsibility for state and federal literacy initiatives and grants. She was a member of the Ohio Literacy Campaign team and coordinated the Summer Institute for Reading Intervention program. Nicole received a bachelor's degree in English literature from Emory University and a master's degree in reading from The Ohio State University, where she is currently pursuing a doctoral degree.

Tom Rutan

Tom Rutan is an Associate Director in the Office of Curriculum and Instruction at the Ohio Department of Education. He currently oversees the areas of social studies, fine arts foreign language and physical education for the state. He is Project Manager for the Ohio High School Program Models Project and is the point person for the agency on the topic of financial literacy. A former history teacher at Upper Arlington and Worthington High Schools, Tom spent 18 years as a building administrator in South-Western City Schools, the last 13 as principal at Grove City High School. His resume includes being selected as the Ohio High School Principal-of-the-Year (1991). He retired from public education in

BUSINESS PANEL ADDENDUM

Ann O. Heyward Vice President, Research and Educational Programs Ohio Aerospace Institute

A lifelong Ohio native born in Cleveland, Ann Heyward has led OAI's Research and Educational Programs Team since September 2000. In this capacity, she leads all sponsored research and education and training activities. Sponsored research activities include the efforts of over 40 research scientists and engineers engaged in research in materials, structures, computational modeling, sensors and electronics, space power, propulsion and communications, and other disciplines for organizations such as the NASA Glenn Research Center, the Air Force Research Laboratory, and multiple industrial clients. Education and training programs include student internship programs sponsored by the NASA Glenn Research Center and the State of Ohio, the Ohio Space Grant Consortium, and the development and delivery of short courses designed to enhance Ohio's aerospace workforce.

Ms. Heyward received her M.S. in Systems Engineering and B.S. with Honors in Mathematics, both from Case Western Reserve University, Cleveland, Ohio. Recently, Ms. Heyward chaired the Community Support Committee for the Celebration of NASA's 50th Anniversary at NASA Glenn. She chairs the F.I.R.S.T. Buckeye Regional High School Robotics Competition Planning Committee and has held positions ranging from Program Chair to President of the NASA Glenn on-site contractors' association, CAPRA. She is a member of the American Institute of Aeronautics and Astronautics .