Guidance on Implementing the Next Generation Science Standards

Committee

Helen R. Quinn

Chair

Helen Quinn (NAS) is professor emerita in the Department of Particle Physics and Astrophysics at the SLAC National Accelerator Laboratory, and co-chair of Stanford University's K12 Initiative. Dr. Quinn is a theoretical physicist who was inducted into the National Academy of Sciences in 2003 and holds numerous honors, including the prestigious Dirac and Klein medals, for her research contributions. She has had a long term engagement in education issues and has worked at the local, state, and national level on them. Her interests range from science curriculum and standards to the preparation and continuing education of science teachers. She was an active contributor to the California State Science Standards development. She is a member and former president of the American Physical Society. Dr. Quinn is the chair of the National Research Council's Board on Science Education. Her other current NRC committee work includes the Committee on a Framework for Assessment of Science Proficiency in K-12. Her previous NRC experience includes the Committee on a Conceptual Framework for New Science Education Standards (chair); the Committee on the Review and Evaluation of NASA's Pre-College Education Program (chair); the committee that produced the report Taking Science to School; and the Committee on Astro 2010 Panel on Particle Astrophysics and Gravitation. She received her Ph.D. in physics from Stanford University.

Matthew Krehbiel

Member

Matthew Krehbiel is the science program consultant for the Kansas Department of Education. Mr. Krehbiel is the primary contact for Kansas' participation in writing the national Next Generation Science Standards (NGSS). Mr. Krehbiel is also a member of the Kansas Common Core State Standards implementation team and the career and technical education agriculture and STEM pathway teams. Before taking the position at the Kansas State Department of Education, Mr. Krehbiel spent 10 years teaching high school science in Kansas. He has taught a wide variety of science courses and was the science, engineering, technology academy leader at Junction City High School. Mr. Krehbiel is a member of the National Research Council's Board on Science Education. He serves on the board of directors for the Council of State Science Supervisors and the Kansas State Science and Engineering Fair. He is also an ex-officio member of the Kansas Association for Conservation and Environmental Education and the Kansas Association for Teachers of Science for the Kansas State Department of Education. In 2010, he received the Award for Excellence in Conservation and Environmental Education from the Kansas Association for Environmental Education. Mr. Krehbiel earned his B.A. in biology and natural sciences and his secondary teacher certification in general science, biology, and physics from Bethel College. He received his M.S. in curriculum and instruction from Kansas State University.

Michael C. Lach

Member

Michael Lach is the director of STEM Policy and Strategic Initiatives at the University of Chicago for the 100kin10 initiative. 100Kin10 is a national, multi-sector effort to create and support 100,000 science, technology, engineering, and mathematics (STEM) teachers by 2021. Prior to joining the University of Chicago, Mr. Lach was special assistant to the Secretary of Education at the U.S. Department of Education (DoEd). Before his work in Washington, D.C., Mr. Lach was Officer of Teaching and Learning for Chicago Public Schools. Mr. Lach began teaching high school biology and general science at Alceé Fortier Senior High School in New Orleans as a charter member of Teach for America. He then joined the national office of Teach for America as Director of Program Design, developing a portfolio based alternative-certification system that was adopted by several states. Mr. Lach represented the DoEd on the National Research Council's Climate Change Education Roundtable. He is a current member of the NRC's Board on Science Education. Previously, he served as a member on the NRC's Committee on Understanding and Improving K-12 Engineering Education in the United States and Committee on High School Science Laboratories: Role and Vision. Mr. Lach earned a B.S. in physics from Carleton College, an M.S. from Columbia University, and an M.A. in education leadership from Northeastern University.

Brian Reiser

Member

Brian J. Reiser is professor of learning sciences in the School of Education and Social Policy at Northwestern University. Dr. 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. Dr. Reiser leads the Scientific Practices project to develop an empirically-based learning progression for scientific practices that species how learners can engage in constructing, applying, and refining scientific knowledge with increasing sophistication from elementary to middle school. Dr. 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, and led the BGuILE (Biology Guided Inquiry Learning Environments), developing software tools for supporting students in analyzing biological data and constructing explanations. Professor 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. Dr. Reiser is a member of the National Research Council's Board on Science Education and a member of the Committee on a Framework for Assessment of Science Proficiency in K-12. He has previously served on the NRC panels authoring the reports Taking Science to School and Conceptual Framework for New Science Education Standards. Dr. Reiser earned his Ph.D. cognitive science from Yale University.

Marshall S. Smith

Member

Marshall S. Smith is a visiting scholar at the Carnegie Foundation for the Advancement of Teaching. He is a former senior counselor to Secretary Arne Duncan and director of international affairs at the U.S. Department of Education (DoEd). He was under-secretary and acting deputy secretary in the DoEd during the Clinton administration. Recently he was a visiting scholar with the Harvard Graduate School of Education. Dr. Smith previously served as a director of education programs at the William and Flora Hewlett Foundation. While at the Hewlett Foundation he funded projects focusing on education technology, California state education policy reform, and college readiness. He is also a former dean of the School of Education at Stanford University. Dr. Smith is a member of the National Research Council's Board on Science Education. Previously, he served as a member of the advisory committee for the NRC Division of Behavioral and Social Sciences and Education; advisory board of the NRC's Center for Education; and the committee on improving learning with information technology. Dr. Smith earned an A.B. in psychology from Harvard College and an Ed.M. and Ed.D. in measurement and statistics from Harvard Graduate School of Education.

Cary I. Sneider

Member

Cary Sneider is associate research professor at Portland State University in Portland, Oregon, where he teaches research methodology in a MAT program for prospective teachers and leads a National Science Foundation-supported project to bridge the gap between high school and college physics. He served as design lead for technology and engineering on the National Research Council's A Framework for K-12 Science Education, and co-chaired a writing team to develop performance expectations in engineering at Achieve, which is managing the development of Next Generation Science Standards for the states. He has been involved in development of the National Assessment of Educational Progress in Science and in Technology and Engineering Literacy, and is currently a member of the National Assessment Governing Board. Dr. Sneider has served previously on a number of NRC boards and committees including the Center for Education advisory board, the Board on Science Education and its predecessor the Committee on Science Education K-12, and the steering committee for the Workshop on Taking Stock of the National Science Education Standards: The Research. His research interests have focused on helping students unravel misconceptions in science and on new ways to link science centers and schools. He has taught science at middle and high schools in Maine, California, Costa Rica, and Micronesia. Over his career he has directed more than 20 grant projects, mostly involving curriculum development and teacher education. Dr. Sneider earned his Ph.D. in education from the University of California, Berkeley.

Roberta Tanner

Member

Roberta Tanner is a retired physics teacher. She taught physics, math, engineering and other science courses for 21 years at a high school in the Thompson School District in Loveland, Colorado. Wanting to spur her students to higher levels of achievement, she brought Advanced Placement Physics and integrated Physics/Trigonometry to the district and taught those for 15 years. She also designed and taught Microcomputer Projects, an award winning project-oriented microchip and electrical engineering course. In addition, she was privileged to work for a year as Teacher in Residence with the Physics Education Research group at the University of Colorado, Boulder. She also taught introductory Physics at the University of Colorado. Ms. Tanner was honored with the International Intel Excellence in Teaching Award in 2004 and the Amgen Award for Science Teaching Excellence in 2011. She served five years on the Teacher Advisory Council, an advisory board to the National Research Council (NRC). She also served on a committee of the National Academy of Engineering, investigating the advisability of National K-12 Engineering Standards. Ms. Tanner is currently serving on the NRC's Board on Science Education and the Committee on a Framework for Assessment of Science Proficiency in K-12. She completed her undergraduate work in physics and mechanical engineering at Kalamazoo College and Michigan State University. She earned her teaching certificate and a master's degree in education at the University of Colorado, Boulder.