



## Supporting the Implementation of *NGSS* through Research: Introduction to NARST Position Papers

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**Rationale.** NARST's mission has two goals specifically related to science education policy. NARST's goals are to communicate science education research findings to researchers, practitioners, and policy makers and to cooperate with other educational and scientific societies to influence educational policies (NARST, n.d.). In keeping with these goals, the NARST leadership team (c. 2013) developed a plan to create position papers that focus on the implementation challenges that would occur with the rollout of the *Next Generation Science Standards (NGSS)*. These short documents on eight different aspects of *NGSS* implementation were written by eight teams of NARST researchers. The position papers are intended to provide a thoughtful, policy-oriented response to the *NGSS* from the standpoint of science education researchers, but aimed at the general public, science educators and policy makers.

**History of the *NGSS*.** In the U.S., there has been a call for updated new standards in science and in other disciplines. Any new standards would need to be adopted, voluntarily, by individual states. In science education, the National Research Council led the way with its publication of the *Framework for K-12 Science Education* (2012), a consensus document that described a research-based structure for how science education might be approached in the 21st century. The *NGSS* followed the *Framework*, adhering to its principles. The *NGSS* were sponsored by the Carnegie Corporation of New York, and partnered with the National Research Council, the National Science Teachers Association, the American Association for the Advancement of Science, and Achieve in a two-part development process. The *NGSS* had two public reviews with extensive feedback from anyone who wished to provide it. The final version of the *NGSS* was released in April 9, 2013. In all, 26 states initially signed on in support of the creation of the *NGSS*. After the *NGSS* were completed and released, each state would need to create legislation to both adopt and implement the *NGSS*. Legislation also would need to include funding to carry out the implementation plans, particularly challenging in the tight economic climates many states are experiencing. The success of the *NGSS* as science education attainable goals is tied to quality of the implementation plans. Thus, implementation issues are a topic well suited to the research focus of NARST.

**Promise of the *NGSS*.** The *NGSS* present an opportunity for substantive improvements in U.S. science education. They could stimulate the development comprehensive, coherent K-12 curriculum materials, rather than relying on piecemeal units developed by teachers or university sources that reach only a few students and are difficult to sustain. The *NGSS* may provide a new ambitious target for professional development activities for science teachers across the grades, stimulating new learning and practices among even our best science teachers. The *NGSS* may suggest some restructuring of preservice teacher education. The depth and breadth of *NGSS* may encourage interdisciplinary cooperation within schools, and more focused use of community resources to enhance the integration of science with other disciplines, drawing STEM professionals into the schools, and drawing students out to their schools to engage in science in

their communities. The *NGSS* are accompanied by assessments, which are under development. If the assessments are well aligned, they will provide information about the developmental nature of student science learning and the changes needed in schools to respond to learning needs of diverse groups of students.

**NARST Position Papers.** Because of NARST Mission's goals and the potential impact of the *NGSS* on science education in the U.S., NARST mounted a response to *NGSS* that focused on implementation. Initially, the NARST leadership team identified eight areas to consider as the *NGSS* are rolled out and implemented, including: accountability, assessment, curriculum materials, engineering, equity, informal science education, preservice teacher education, and professional development. (There are other topics that also should be included when considering *NGSS* implementation, and more papers may follow.) For each area, an expert writing team was formed to create a short position paper, informed by current research in science education. Each writing team was charged to include an equity expert related to its topic. The papers attempt to paint brief, but vivid, pictures of the network of change needed to implement the *NGSS*. The state of K-12 science education in the U.S. suggests that a comprehensive response to the *NGSS* is likely to be helpful to the policymakers, practitioners, and parents who will ask questions and need thoughtful answers. This set of position papers is seen as the first step, and may suggest a series of activities over several years to build a research program on implementation of the *NGSS*. A major strength that NARST brings to this challenge is that its members can provide the research to enhance the implementation of the *NGSS*.

#### References

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