National Science Teaching Association Position Statement

Principles of Professionalism for Science Educators

Introduction

Science educators play a vital role in preparing students to participate thoughtfully, ethically, and critically in an increasingly complex scientific and technical world. To fulfill this role, science educators must uphold the highest professional, ethical, and pedagogical standards, ensuring public trust in educators and the teaching profession.

High-quality science instruction is a collaborative and systemic endeavor that requires shared responsibility among teachers, school leaders, district administrators, families, and community partners. Effective science education depends on sustained partnerships that support coherent curriculum, ongoing professional learning, high-quality instructional resources, and safe and productive learning environments.

Grounded in current research and national policy, including *A Framework for K–12 Science Education* (NRC 2012) and the *Next Generation Science Standards* (NGSS Lead States 2013)—as well as contemporary models of teaching and learning—the National Science Teaching Association (NSTA) affirms the following principles to guide professional conduct, inform professional learning, shape institutional policy, and support advocacy efforts across formal and informal science education contexts.

Declaration

NSTA calls upon science educators to embrace their professional responsibility by upholding the following principles.

Principle 1: Educators should ensure that all students have high-quality, rigorous, and engaging science learning opportunities.

- When educators elicit, notice, value, and build on the many ideas, experiences, strengths, and assets that learners bring to the classroom, they can foster connections between students' existing funds of knowledge and curiosity about the world around them, supporting meaningful learning (NASEM 2022).
- Grounding instruction in relevant phenomena and problems enables students to actively construct, apply, and refine their scientific understanding. Science educators can facilitate purposeful discourse among students to support sense-making, reasoning, and argumentation from evidence (NRC 2012). Through structured discussion, questioning, modeling, and collaborative investigation, teachers promote engagement in three-dimensional learning that integrates disciplinary core ideas, science and engineering practices, and crosscutting concepts (NRC 2012).

- Providing high-quality, rigorous, and engaging learning opportunities for all students will require educators to pay particular attention to addressing ongoing disparities in access and opportunity and acknowledging historical injustices in science and education (NASEM 2021). *A Framework for K–12 Science Education* emphasizes the importance of providing all students with meaningful opportunities to learn science, noting that "arguably, the most pressing challenge facing U.S. education is to provide all students with a fair opportunity to learn" (NRC 2012, 14).

Principle 2: Educators should commit to continuous professional learning grounded in research and reflective practice.

- Sustained and transformative professional learning (NSTA 2024) enables educators to refine their instructional strategies, strengthen their content knowledge, and enhance their capacity to support students' sense-making through three-dimensional learning (NRC 2012; NASEM 2015).
- Through systematic reflection on practice, analysis of student work and thinking, and participation in professional learning communities, science educators improve the quality and coherence of curriculum, assessment, and instruction (Darling-Hammond et al. 2017; Desimone and Garet 2015). Reflective practice supports informed instructional decision-making, fosters continuous improvement, and strengthens teachers' ability to respond productively to student thinking (NRC 2012).

Principle 3: Educators should serve as leaders and advocates for science education, promoting scientific literacy, informed decision-making, and community engagement.

- Science educators serve as leaders within their classrooms, schools, districts, professional organizations, and communities, advocating for equitable, high-quality science education for all learners (Whitworth et al. 2022; York-Barr and Duke 2004).
- Through leadership, professional collaboration, and public engagement, science educators support policies, practices, and resources that strengthen science teaching and learning.
- Through collective responsibility and shared leadership, educators strengthen program coherence; expand instructional capacity; and ensure that students have access to the tools, technologies, and learning experiences they need to engage deeply in scientific investigation, engineering design, and sense-making (Darling-Hammond et al. 2017).

Principle 4: Educators should uphold public trust and strengthen the integrity of the science education profession.

- Science educators uphold the highest standards of professional ethics, integrity, and responsibility in their interactions with students, families, colleagues, and the broader community. They engage in responsible decision-making; maintain professional boundaries; and adhere to institutional, legal, and ethical guidelines. In doing so, science educators strengthen the credibility of science education, foster a culture of trust and professionalism, and contribute to the integrity and sustainability of the profession.
- Science education should provide all students with sufficient knowledge of science and engineering to engage in public discussions on science-related issues, become thoughtful consumers of scientific and technical information, and enter the careers of their choice (NRC 2012). By modeling respect for scientific evidence, intellectual honesty, and ethical reasoning, science educators demonstrate the values and norms of scientific practice (AAAS 1990) and how these can prepare students to evaluate evidence and make informed decisions on societal issues such as climate change, public health, and more.

Principle 5: Educators should collaborate with students, families, school leaders, colleagues, and community members to ensure everyone has access to the necessary resources for high-quality science teaching and learning.

- By partnering with families, community organizations, informal science institutions, and industry partners, educators extend learning beyond the classroom and foster meaningful connections between scientific and engineering knowledge and real-world contexts (NASEM 2015).
- By building strong partnerships, schools and districts can leverage local cultures, knowledge, and resources to enhance science education and improve student engagement (Smith and Sobel 2010). These collaborations help align curriculum with community values, fostering a more inclusive, relevant, and effective learning environment for all students.
- High-quality science education is supported through sustained collaboration among educators, school leaders, families, and community partners. Science educators actively participate in collaborative structures that promote coherent curriculum design, effective instructional practices, access to high-quality instructional materials, and supportive learning environments aligned with *A Framework for K–12 Science Education* (NRC 2012) and the *Next Generation Science Standards* (NGSS Lead States 2013).
- Science educators require sustained institutional and community support—including from schools, districts, professional organizations, and policymakers—to fulfill their professional responsibilities. This support includes the provision of safe and professional working conditions; adequate time for instructional planning, collaboration, and reflection; sufficient instructional materials and laboratory resources; reasonable teaching loads, particularly for novice educators; and ongoing opportunities for high-quality professional learning throughout their careers (NSTA 2024).

—Adopted by the NSTA Board of Directors, June 2007

—Revised and approved by the NSTA Board of Directors, November 2010

—Revised and approved by the NSTA Board of Directors, April 2026

References

American Association for the Advancement of Science (AAAS). 1990. *Science for All Americans*. Oxford University Press. https://www.aaas.org/resources/science-all-americans.

Bevan, Bronwyn, Justin Dillon, George E. Hein, et al. 2010. *Making Science Matter: Collaborations Between Informal Science Education Organizations and Schools*. Center for Advancement of Informal Science Education. https://informalscience.org/wp-content/uploads/2019/02/MakingScienceMatter.pdf.

Darling-Hammond, Linda, Maria E. Hyler, and Madelyn Gardner. 2017. *Effective Teacher Professional Development*. Learning Policy Institute. https://learningpolicyinstitute.org/sites/default/files/product-files/Effective_Teacher_Professional_Development_REPORT.pdf.

Desimone, Laura M., and Michael S. Garet. 2015. "Best Practices in Teachers' Professional Development." *Psychology, Society, and Education* 7 (3): 252–63. https://repositorio.ual.es/bitstream/handle/10835/3930/Desimone%20En%20ingles.pdf.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2015. *Science Teachers' Learning: Enhancing Opportunities, Creating Supportive Contexts*. National Academies Press. https://www.nationalacademies.org/projects/DBASSE-BOSE-11-04/publication/21836.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2021. *Call to Action for Science Education: Building Opportunity for the Future*. National Academies Press. https://doi.org/10.17226/2900.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2022. *Science and Engineering in Preschool Through Elementary Grades: The Brilliance of Children and the Strengths of Educators*. National Academies Press. https://www.nationalacademies.org/publications/26215.

National Research Council (NRC). 2012. *A Framework for K–12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. National Academies Press. https://www.nationalacademies.org/projects/DBASSE-CFE-09-16/publication/13165.

National Science Teaching Association (NSTA). 2024. *Professional Learning in Science Education*. Position Statement. NSTA. https://www.nsta.org/nstas-official-positions/professional-learning-science-education.

NGSS Lead States. 2013. *Next Generation Science Standards: For States, By States*. National Academies Press. https://www.nationalacademies.org/publications/18290.

Smith, Gregory A., and David Sobel. 2010. *Place- and Community-Based Education in Schools*. Routledge. https://www.taylorfrancis.com/books/edit/10.4324/9780203858530/place-community-based-education-schools-gregory-smith-david-sobel.

Whitworth, Brooke A., Julianne A. Wenner, and Dorit Tubin. 2022. "Science Teacher Leadership: The Current Landscape and Paths Forward." In *Handbook of Research on Science Teacher Education*, edited by Julie A. Luft and M. Gail Jones. Taylor and Francis. https://www.taylorfrancis.com/chapters/edit/10.4324/9781003098478-23/science-teacher-leadership-brooke-whitworth-julianne-wenner-dorit-tubin.

York-Barr, Jennifer, and Karen Duke. 2004. "What Do We Know About Teacher Leadership? Findings from Two Decades of Scholarship." *Review of Educational Research* 74 (3): 255–316. https://doi.org/10.3102/00346543074003255.

Suggested Citation

National Science Teaching Association (NSTA). 2026. Principles of Professionalism for Science Educators. Position Statement. NSTA. https://www.nsta.org/nstas-official-positions/principles-professionalism-science-educators