

Minnesota Science Teachers Association (MnSTA) Position Statement on Elementary School Science

The Minnesota Science Teachers Association strongly supports the concept that science must be a basic component in the daily curriculum of every elementary school student at every grade level. In the last decade, numerous reports have been published calling for reform in education. Each report has highlighted the importance of early experiences in science to allow students to develop lifelong curiosity for the natural world and problem-solving skills that empower them to participate in an increasingly scientific and technological world.

Science experiences for elementary students have become less common in many Minnesota schools due to a variety of reasons, including: the testing emphasis in reading, writing and math; diminished confidence of some teachers in approaching science content; limited participation in science-focused professional development at the elementary level; and the need for teacher professional development in the integration of science with reading, writing, social studies and math. Survey data from the National Assessment of Educational Progress (R.Blank, 2012), indicates that Minnesota 4th grade students get an average of 2.4 hours of science instruction per week, compared to a national average of 2.8 hours per week. **MnSTA recommends that every elementary student in Minnesota should receive the equivalent of at least 3 hours of science instruction per week.** This recommendation supports and encourages science instruction through an integrated approach. "Research has indicated that high-quality, center-based preschool programs can increase school readiness and narrow early learning gaps for children from low-income families and children of color, including in math and science" (Mueller, 2014). The report recommends that minority elementary students would benefit from a boost in time spent on science in school. Minnesota lags behind in this effort. The elementary science program must provide opportunities for students to develop understandings and skills necessary to function productively as problem-solvers in a scientific and technological world.

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- Elementary school students learn science best when—
 1. they experience the practices of science and engineering through hands-on exploration and investigations where students ask questions, test possible explanations, and construct their own understanding of phenomena.
 2. instruction builds directly on the student's conceptual framework and daily experiences
 3. content is organized on the basis of broad conceptual themes or crosscutting concepts common to all science disciplines.
 4. mathematics and communication skills are an integral part of the science instruction.
 5. science is taught and assessed as a process to seek an understanding of the nature world rather than a collection of facts.
- The learning environment for elementary science must foster positive attitudes towards self and society, as well as science. Elementary school students value science best when—
 1. a variety of instructional strategies aligned with best practices in science education are used to facilitate learning, and students are given opportunities to interact and share ideas with their peers.
 2. the scientific contributions of individuals from all ethnic origins are recognized and valued.
 3. other subject areas are infused into science.
 4. inquiry skills and positive attitudes are modeled by the teacher and others involved in the education process.
- Teacher preparation and professional development must enable the teacher to implement science as a basic component of the elementary school curriculum. Teacher preparation and professional development must provide for—

1. experiences that will enable teachers to use hands-on activities to promote skill development, selecting content and methods appropriate for their students, and for design of classroom environments that promote positive attitudes toward science and technology.
 2. continuing science inservice programs based on current educational research that encompass content, skills, techniques, opportunities to share their expertise, time to plan for classroom implementation, and useful materials.
 3. participation in workshops, conferences, and meetings sponsored by local, state, and national agencies.
- The school administrators must be advocates for elementary science. Administrators must provide instructional leadership and support by—
 1. building consensus for an elementary science program that reflects state and national standards.
 2. implementing and monitoring the progress of the science program.
 3. supplying appropriate materials, equipment, and space.
 4. maintaining smaller class sizes to maximum student engagement and safety during science investigations.
 5. recognizing exemplary elementary science teaching.
 6. encouraging and supporting special science events.
 - The instructional implementation and support system for elementary school science must include the combined efforts of the community and advocate for elementary school science by—
 1. participating in ongoing planning, assessment, and funding of elementary science programs.
 2. promoting informal science learning experiences.
 - Ongoing formative and summative assessments must be an essential component of an elementary science program. Assessment must be aligned with—
 1. what is of value, i.e., the problem-solving model of instruction: concept application, inquiry, and science and engineering practices.
 2. the curricular objectives and instructional mode.
 3. the purpose for which it was intended: grading, diagnosis, student and/or parent feedback, or program evaluation.
 - Elementary school science instruction must reflect the application and implementation of educational research. Elementary school science programs are improved when—
 1. teachers keep abreast of appropriate science education research.
 2. educational research becomes the premise for change or innovation in elementary school science, and teachers participate in action research in elementary science

—Adopted by the MnSTA Board of Directors, January 2017

References

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