

# STRATEGY 2005 GOALS



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# A Message from the NSTA Board of Directors

Whether in the business world or the world of education, a clear vision, backed by definite plans, is a vital component of success. As NSTA furthers its mission to promote excellence and innovation in science teaching and learning for all, it must think strategically and critically about the future. Above all, NSTA considers it essential to focus its activities and efforts to ensure successful implementation of its strategic goals.



In 2000, NSTA identified issues that are crucial to the direction of science education. Using these issues as a foundation, NSTA developed and began implementing *Strategy 2000*, a pioneering plan to guide the association's efforts five years into the new century. *Strategy 2000* served as a powerful tool to help NSTA make important decisions about its many activities and directions.

National issues and policies have changed the science education landscape, and NSTA must respond to these changes. NSTA must examine its priorities, establish new goals to better focus its efforts, and select activities that will address the needs of science educators and the science education community. The association has assembled a broad and diverse team to facilitate and lead the development process, with the NSTA Board and Council devoting considerable time during fiscal year 2004 toward establishing a new direction.

*Strategy 2005* articulates four comprehensive strategic goals that will enable NSTA to respond proactively to emerging issues affecting science education now and in the future. It provides direction that will have a lasting and positive impact on NSTA, the teaching profession, and science education in general.

NSTA's Strategic Goals for 2005–2010 are as follows:

1. Engage All Teachers of Science Continually To Improve Science Education.
2. Improve Student Learning by Supporting and Enhancing Science Teaching.
3. Advocate for the Importance of Science, Both Science Literacy and the Development of Scientific Expertise.
4. Enhance Science Education Through Research-Based Policy and Practice.

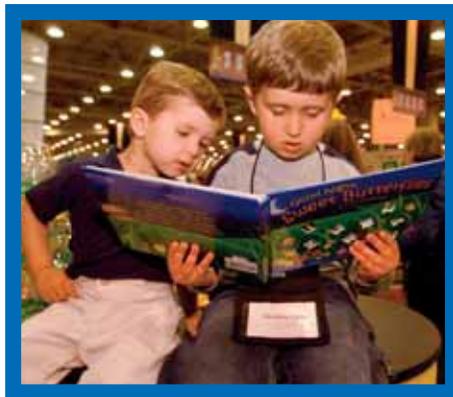
*Strategy 2005* reaffirms NSTA's quest to be the leader in science education. We are excited about this new endeavor and the promise it holds for NSTA. We invite all stakeholders to join NSTA in promoting excellence and innovation in science teaching and learning for all.

A handwritten signature in blue ink that reads "Anne L. Tweed". The signature is fluid and cursive.

Anne L. Tweed  
2004–2005 President

*Education has no higher purpose than preparing people to lead personally fulfilling and responsible lives. For its part, science education—meaning education in science, mathematics, and technology—should help students to develop the understandings and habits of mind they need to become compassionate human beings able to think for themselves and to face life head on. It should equip them also to participate thoughtfully with fellow citizens in building and protecting a society that is open, decent, and vital. America’s future—its ability to create a truly just society, to sustain its economic vitality, and to remain secure in a world torn by hostilities—depends more than ever on the character and quality of the education that the nation provides for all of its children.*

(*Science for All Americans*, “The Need for Science Literacy,” p. xii)



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## **Our Vision:**

**“...to be the leader  
in science education.”**

## **Our Mission:**

**“...to promote excellence and  
innovation in science teaching  
and learning for all.”**

**NSTA**

# Chapter 1

# The National Science Teachers Association





## Chapter 1

# The National Science Teachers Association

Founded in 1944, the National Science Teachers Association is the world's largest science teachers' organization dedicated to promoting "excellence and innovation in science teaching and learning for all." NSTA's 55,000 members—representing science educators, science supervisors, informal science educators, administrators, scientists, and leaders in business, industry, and government—allow NSTA to be the "keeper of the conversation" on science education within the United States.

NSTA is the major voice of science teachers, a passionate supporter of quality science education, and a key player in setting the nation's science education agenda. The voices of many are heard through the governance structure and unique opportunities for interaction that NSTA provides.

NSTA is governed by a Board of Directors that has two advisory bodies: the NSTA Council and the National Congress on Science Education. The Board of Directors consists of elected officers, including a president, president-elect, and retiring president, as well as 10 elected division directors representing varied levels and functions of science education. The Council consists of directors elected from 18 districts, including the United States, Canada, and the U.S. territories, and eight Affiliate Presidents. The Congress is composed of science education leaders from each NSTA State Chapter and Associated Group, who meet annually to discuss and bring forth resolutions and direction for Council and Board consideration.

NSTA is uniquely positioned to lead the conversation on science education and engage all teachers of science, as its reach extends beyond its members to the larger science education community. NSTA engages the science education community through the:

- NSTA website ([www.nsta.org](http://www.nsta.org)), which delivers on average more than 500,000 page impressions per month;
- *NSTA Express*<sup>™</sup>, NSTA's e-mail newsletter, which reaches more than 220,000 educators weekly;
- NSTA SciLinks<sup>™</sup>, PDLinks, and HealthLinks, which receive about 58,000 visits each month from students and teachers seeking to access vetted educational materials found at nearly 400,000 web pages;
- NSTA regional and national conferences, which attract 25,000 educators annually; and
- NSTA journals, which include *Science and Children*, *Science Scope*, *The Science Teacher*, and *Journal of College Science Teaching*.

Providing a way to improve student learning by supporting and enhancing science teaching, NSTA products and resources have a large and strong audience base that is evidenced by the following:

- NSTA journals are read by approximately 70,000 science educators;
- Building a Presence for Science (BaP), NSTA's volunteer teacher network, is comprised of more than 40,000 educators in 30 states; and
- NSTA Press<sup>®</sup> and NSTA's publications division sell more than 100,000 books annually.

NSTA serves as an advocate for the importance of science literacy and the development of scientific expertise in the following ways:

- NSTA monitors and identifies crucial legislation that affects science and mathematics education.
- NSTA works with key members of Congress and their staff on specific legislation and issues such as yearly funding levels for science, technology, engineering, and mathematics (STEM) education.
- NSTA develops outreach activities that connect the U.S. Congress with the science education community.



## Guiding Principles

“Guiding Principles” ensure the highest intellectual, ethical, and fiscal integrity of an organization. They serve as a beacon and a constant reminder in the conduct of NSTA’s business, guiding the association’s relationship with its members, its partners, and its customers. These principles articulate the association’s culture.

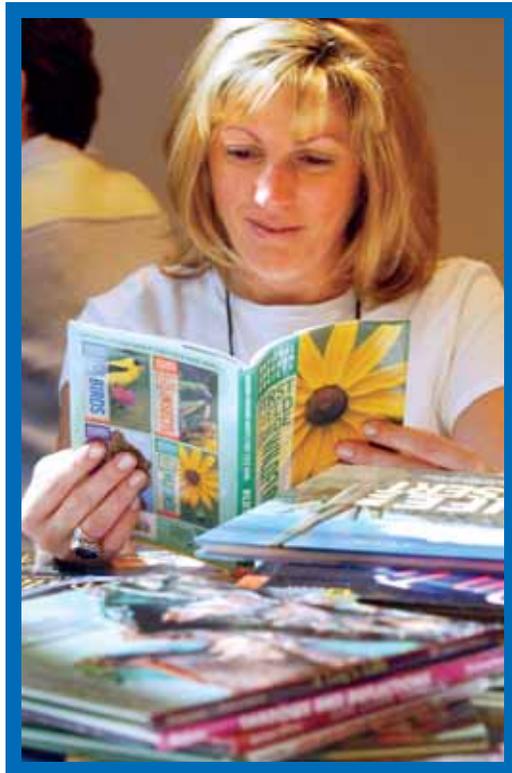
The NSTA Guiding Principles are

- Model excellence;
- Champion science literacy;
- Value scientific expertise;
- Embrace diversity, equity, and respect;
- Enhance teaching and learning through research;
- Collaborate with partners; and
- Exemplify a dynamic professional organization.

Keeping the vision “to be the leader in science education” as the destination and guided by these principles, NSTA possesses a very knowledgeable community of members and colleagues, an effective and comprehensive set of programs and services, and a broad and influential group of government and corporate partners. These unique organizational assets provide the foundation from which NSTA moves forward strategically. To understand how NSTA can do this, however, it is important to first understand the strategic context in which NSTA operates.

## Chapter 2

# Strategic Context







## Chapter 2

# Strategic Context

As we progress into the 21st century, science will play an increasingly central role in global and local information, in political and economic decisions, and in our personal lives. To prepare students to be active and thoughtful participants in such a society, science education must be dramatically improved. Highly-qualified teachers who have a solid grasp of science content are central to a quality science education. This is especially important in the context of standards-based reforms that demand substantive changes in teachers' beliefs about teaching and learning, and in turn, their practice.

With the convergence of various external factors and pressures, our nation's attention is beginning to focus on science education. As suggested by national and international indicators, most of our students are not being prepared for their future, alarming leaders in state, federal, and corporate America. States are wrestling with issues regarding funding, science teacher retention, and high-quality preservice and inservice education. Accountability requirements have led to new ideas on how to assess student achievement. At the same time, our nation is realizing that a shortage of science teachers exists. With both government and corporate America concerned about their future scientific and engineering workforce, competition for science-oriented graduates will only increase.

With a national trend toward more diverse classrooms, teachers are being presented with new challenges. Are all students prepared to learn, and do all teachers believe that they can learn? Because equity and cultural diversity are respected, the new challenge for teachers is to provide differentiated instruction that meets the needs of each child.

Now more than ever, science and science education research is informing curriculum, assessment, and instructional practices. *How Students Learn* (Na-



tional Research Council, 2005), for example, synthesizes research for teacher use and classroom practice, enabling teachers to be more effective practitioners. Pedagogical content knowledge affords teachers information about how to best deliver instruction to reduce student preconceptions and support diverse learners.

Additional research on formative assessment identifies the importance of continual feedback in the classroom. Using formative assessments informs teachers about what students understand and are able to do and also allows students to determine what they do and do not know.

Emerging research around inquiry-based science education supports learning about inquiry as content and as an instructional strategy. Classrooms centered on conceptual understanding provide students with opportunities to design and conduct investigations and communicate the findings or results of their investigations. For students to demonstrate understanding, they must be able to apply their learning to new situations. This occurs when students have studied science concepts in depth and in environments where discussion of scientific questions is the norm.

The growing technical sophistication of young learners and the increased emphasis on, and un-

derstanding of, enhanced teaching and learning demands that we use appropriate technology when providing resources and professional development for teachers. The ubiquity of the internet and the capability for dissemination and collaboration it economically affords, along with the growing population of tech-savvy young learners, mean we can—and must—do things differently.

Professional development is the core of NSTA. With its conferences, professional development institutes, technical symposia, books, and journals, NSTA continually strives to provide quality content to teachers of science. The challenge, however, has been scale: How does NSTA reach beyond its members to provide meaningful learning and support for *all* teachers of science?

Addressing this challenge requires NSTA to employ new approaches. Fortunately NSTA is well positioned to provide the vision and expertise to do this. The association's technical infrastructure, educational expertise, professional development programs, numerous high-quality publications, broad communication reach, and science educator services form the core of NSTA's internal strengths. NSTA's impact on a national scale is unmatched in the science education community. These assets are key to the accomplishment of NSTA's mission and strategic goals.

# Chapter 3

## Strategic Goals



## **NSTA Strategic Goals and Objectives**

### **STRATEGIC GOAL 1:**

#### **Engage All Teachers of Science Continually To Improve Science Education.**

- Objective 1.1: Create engagement strategies for teachers of science worldwide that increase and retain membership.
- Objective 1.2: Implement recruitment and retention strategies to engage preservice and retired science teachers.
- Objective 1.3: Increase the engagement of teachers of science from underserved populations.
- Objective 1.4: Provide leadership development opportunities for science educators.
- Objective 1.5: Promote the exchange of ideas, people, and resources nationally and internationally.

### **STRATEGIC GOAL 2:**

#### **Improve Student Learning by Supporting and Enhancing Science Teaching.**

- Objective 2.1: Provide and support high-quality professional development opportunities for educators.
- Objective 2.2: Provide tools and resources that support high-quality and effective science teaching.
- Objective 2.3: Implement strategies to connect science educators with the broader science community.
- Objective 2.4: Implement strategies to connect informal science education to the instructional needs of teachers of science.

### **STRATEGIC GOAL 3:**

#### **Advocate for the Importance of Science, Both Science Literacy and the Development of Scientific Expertise.**

- Objective 3.1: Advocate for high-quality science education with policy makers, school administrators, and community, business, industry, and higher education leaders.
- Objective 3.2: Engage corporations in supporting science education.
- Objective 3.3: Promote NSTA's positions on science education issues.
- Objective 3.4: Engage families in the support of effective science education.
- Objective 3.5: Promote the importance of developing the scientific workforce.
- Objective 3.6: Promote the importance of scientific literacy to the general population.

### **STRATEGIC GOAL 4:**

#### **Enhance Science Education Through Research-Based Policy and Practice.**

- Objective 4.1: Promote the use of education research to inform policy and practice.
- Objective 4.2: Develop research expertise and practice among teachers of science.
- Objective 4.3: Influence the science education research agenda.
- Objective 4.4: Analyze and disseminate research on science education.

## Chapter 3

### Strategic Goals

Over the period of a year, the NSTA Board of Directors and the NSTA Council analyzed the challenge of attaining high student achievement in science education within the framework of external factors and pressures, mapped onto the opportunities afforded by NSTA's strengths. What emerged in February 2005 were four strategic goals. These strategic goals chart the direction for NSTA as it addresses science education reform during the next five years.

- Engage All Teachers of Science Continually to Improve Science Education.  
*(This goal broadens NSTA's support for science education reform beyond its membership.)*

- Improve Student Learning by Supporting and Enhancing Science Teaching.  
*(This goal focuses NSTA's professional development portfolio on the "bottom line"—student learning.)*
- Advocate for the Importance of Science, Both Science Literacy and the Development of Scientific Expertise.  
*(This goal brings the classroom voice to educational policymaking.)*
- Enhance Science Education Through Research-Based Policy and Practice.  
*(This goal involves systematically using data and research to guide NSTA's actions.)*

During the past five years, NSTA has invested heavily in both human expertise and technological resources to address the issues of scale, standards, and sustainability. This investment positions NSTA to achieve its strategic goals.





**STRATEGIC GOAL 1: Engage All Teachers of Science Continually To Improve Science Education.**

*“Successful learning for teachers requires a continuum of coordinated efforts that range from preservice education to early teaching to opportunities for lifelong development as professionals. Creating such opportunities, built out of the knowledge base from the science of learning, represents a major challenge, but it is not an impossible task.”*  
*(How People Learn, p. 205)*

Central to true reform in science education is the issue of reaching expansive scale: engaging *all* teachers of science. To accomplish this, NSTA must look beyond its membership and traditional member services to identify a spectrum of accessible engagement activities. Such engagement strategies must be continuous and reflect a range of opportunities, each supportive of and appropriate to the career needs of the teacher of science.

Achieving this goal requires NSTA to think “outside of the box.” The association’s engagement opportunities must be publicized, customized, and continuous-

ly viewed by each teacher of science as contributing to their professional growth, development, and recognition throughout their career. Accomplishing this requires the use of advanced technology to continually engage all teachers of science.



**STRATEGIC GOAL 2: Improve Student Learning by Supporting and Enhancing Science Teaching.**

*Effective professional development experiences... provide opportunities for teachers to build their content and pedagogical content knowledge skills... are research based and engage teachers as adult learners in the learning approaches they will use with their students...relate to student learning, and they are continuouslyevaluatedtoensure a positive impact....*  
*(Designing Professional Development for Teachers of Science and Mathematics, p. 46–47)*

Central to NSTA’s mission is high-quality professional development to support and enhance science teaching. Historically, NSTA has been recognized for its contributions to science teaching through its conventions, journals and other publications, and programs. However, the Professional Development Task Force, appointed by the NSTA Board of Directors, has recommended that NSTA broaden, deepen, and make more comprehensive its professional development offerings—with the focus on student learning.

NSTA's regional and national conferences now support in-depth institutes and symposia on such important topics as assessment and inquiry; these events are enhanced through established partnerships with leading expert educational organizations and government agencies. New "business-to-business" services are being designed for, marketed to, and implemented in school districts to improve the quality of their science education programs. Likewise, informal educators are assisting NSTA in defining strategies and providing opportunities to support the instructional needs of teachers of science.

While initial steps have been taken to broaden and deepen NSTA's professional development portfolio and make it more comprehensive, enhancing teachers' science content knowledge on a national scale remains the association's vision. NSTA is poised to create its electronic professional development system (e-PD System), which will deliver rich science content that is individualized, customized, and delivered on demand.

### **STRATEGIC GOAL 3: Advocate for the Importance of Science, Both Science Literacy and the Development of Scientific Expertise.**

*"In a world filled with the products of scientific inquiry, scientific literacy has become a necessity for everyone. Everyone needs to use scientific information to make choices that arise every day. Everyone needs to be able to engage intelligently in public discourse and debate about important issues that involve science and technology. And everyone deserves to share in the excitement and personal fulfillment that can come from understanding and learning about the natural world."*  
(National Science Education Standards, p. 1)

The national documents—*National Science Education Standards* (NRC 1996), *Atlas of Science Literacy* (AAAS 2000), *Benchmarks for Science Literacy* (AAAS 1993), and *Science for All Americans* (AAAS 1990)—have presented a carefully-crafted description of the ideas and skills that all students will need to achieve science literacy. States and districts have modeled their own standards after these docu-

ments, and stakeholders at every level are learning how to evaluate, modify, and develop assessments, curricula, and instructional materials to reflect the vision of science literacy. NSTA fully and enthusiastically supports the vision of science literacy described in these national documents.



Increasing private, public, and governmental support for science education is critical to enhancing science literacy and the development of scientific expertise. From parental involvement in the classroom to local, state, and federal funding of science education, NSTA must collaborate synergistically and strategically with others to build a broader and stronger voice for science education.

At state and local levels, collaboration with state science associations and other like-minded groups is important for successful advocacy efforts that result in a coordinated national voice on science education issues. Similarly, engaging corporate America to establish mutually beneficial partnerships will expand support for science education and assist corporations in achieving their workforce and community-based goals.



#### **STRATEGIC GOAL 4: Enhance Science Education Through Research-Based Policy and Practice.**

*“At its core, scientific inquiry is the same in all fields. Research...is a continual process of rigorous reasonings supported by a dynamic interplay among methods, theories, and findings. It builds understanding in the form of models or theories that can be tested.” (Shavelson and Towne 2003, p. 2)*

NSTA is positioned to influence the science education research agenda, disseminate results, provide professional development to teachers and school leaders that exemplifies best practices and research, and encourage a research-based approach to teaching and curriculum development.

Raising the issues that are especially important to science education, and therefore to NSTA, are driving questions, such as: “How does one translate research into policy and practice?”, “Which policies and practices promote not just research but also implementation of research outcomes?”, and “What barriers exist in classrooms and schools that promote or inhibit such implementation?” A shared vision for science education must include relevant educational research findings and applications that strengthen NSTA’s knowledge base, inform its practices, and lead its policy initiatives.

Over the past 50 years, the science education community has developed many science education resources, accumulated significant information about how students learn, and defined much about the nature of effective science teaching. However, the science education community needs to identify and pursue a systematic scientific research agenda for what it still needs to know about learning and teaching in science for the purpose of improved student learning. Facing the challenges in science education today and the next several decades requires teachers at all levels to be informed and responsible users of scientifically-based research. And teachers should be able to apply significant findings from their research in their own and others’ classrooms (individual teacher action research) to large-scale collaborative projects.

The practitioner, researcher, and policy communities must have strong connections if the findings from high-quality research are to be successfully used by all stakeholders. Research-based policy and practice enables more effective teaching, curricular, and policy decisions that lead to excellence and innovation in science teaching and learning for all.

## Chapter 4

# Strategic Next Steps





## Chapter 4

# Strategic Next Steps

Ambitious, comprehensive, visionary, and significant are words that describe NSTA's Strategic Goals and Objectives. Yet words without commensurate actions are merely dreams that have little impact or effect. When appropriate action is taken, the dreams become a roadmap for NSTA's future. As the association learned with Strategy 2000, articulating the goals and associated objectives is just the first step. After determining strategic goals and objectives, a systems-planning process that results in an implementation plan must be created.

An implementation plan articulates specific actions to be taken, establishes milestones and benchmarks for progress, and designates timelines for accomplishment. Concurrently with the development of an implementation plan, an evaluation strategy must be defined that specifies indicators of success. Implementation strategies will lead to actions and activities that directly align with the Strategic Goals and Objectives. Clear outcomes will provide the direction needed as NSTA charts the progress toward accomplishing its goals.

NSTA must be *strategic*, selecting only those activities that will move the association dramatically, yet steadily, toward its goals. But NSTA must refrain from trying to accomplish this entire plan all at once. The process of selecting implementation activities will begin with a review of current efforts that address specific goal objectives. Annual targets will be set and performance indicators determined. The strategic plan must set priorities that address the current climate of science education.

NSTA must continuously *evaluate and adjust* its activities. To be strategic and effective, evaluation that is ongoing and periodically assessed is critical to successful implementation. Collecting data and using that data to modify its efforts is a central piece of NSTA's systematic efforts. Clearly, some



goals and objectives will be ongoing, and part of the process will include assessing NSTA's progress toward its goals.

NSTA must *work collaboratively*. Simply put, NSTA cannot do it alone. The NSTA membership and elected officers must work as a team with the Council, the National Congress of Science Education, and science education stakeholders. The association must not only work with its present partners, but also must search out new partnerships to achieve its goals. Candidate partners may come from other professional societies, governmental agencies, and corporate America.

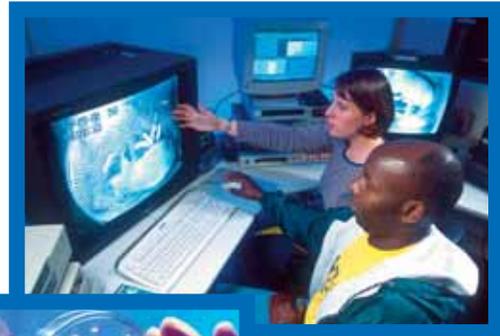
NSTA will know when it has achieved success when it has engaged not only teachers of science, but

also those who impact science teaching. NSTA will have succeeded in its mission when: all teachers of science, both nationally and internationally, are connected to NSTA as their source for professional collaboration; the needs of science educators for content understanding, professional development, and resources for teaching and learning are met; and science education research is being used to inform teaching practice.

NSTA envisions a future in which all students receive a high-quality science education throughout their academic years. When this vision is shared and embraced by policy makers, school administrators, the education community, and the public at large, the result will be improved student learning of science and a more scientific literate society.



# Appendices



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# Appendix 2: Acknowledgements

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## **Our Vision:**

**“...to be the leader  
in science education.”**

## **Our Mission:**

**“...to promote excellence and  
innovation in science teaching  
and learning for all.”**



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