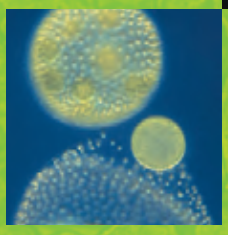
National Science Resources Center

THE NATIONAL ACADEMIES Smithsonian Institution



2006 Annual Report

Delivering Excellence in Science Education

In Memoriam

This report is dedicated to the memory of Richard Curcio, Vice President of the Lucent Technologies Foundation, who passed away in 2005. Among his many contributions to science education reform, Rich was instrumental in spearheading the improvement of science education programs in Lucent communities and throughout the country, and in launching the Smithsonian Science Education Academies for Teachers. He touched countless lives through his vision, enthusiasm, and commitment to the education of children everywhere.

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National Science Resources Center

THE NATIONAL ACADEMIES Smithsonian Institution

The **National Science Resources Center** was established in 1985 by the **Smithsonian Institution** and the **National Academies** to improve the learning and teaching of science for all students in the United States and throughout the world. The prestige and credibility of these two world-renowned institutions provide the NSRC with access to research, scientific expertise, and resources to inform our work. They provide the NSRC with the unique opportunity to catalyze the reform of science education with leaders representing school districts, academic institutions, businesses, museums, foundations, government agencies, scientific and engineering societies, publishers of education resources, and nonprofit organizations working to improve K–16 science education.

The NSRC advances the missions of its parent institutions by expanding and extending their important work in the following ways:

- Translating their research, resources, and best practices into products and services which are disseminated to leaders working to improve K–16 science education;
- Building leadership capacity, especially within the science and engineering communities, to leverage change at the school district and state levels; and
- Educating a broad constituency of leaders about the important work of both institutions in science education.

NSRC

The National Academies are composed of three academies—the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine—and their operating arm, the National Research Council. These institutions work outside the framework of government to ensure independent advice to the nation on matters of science, technology, and medicine.

The Smithsonian Institution was established in 1846 with a mission of increasing and diffusing knowledge. For more than 160 years, the Smithsonian has used its unique, publicly accessible collections, research, and staff to inform, educate, and inspire a diverse public. In doing this, it has become one of the most widely recognized institutions in the world for both its contributions to science and its unparalleled ability to make its research and collections accessible to people of all ages.

"You cannot teach a man anything; you can only help him discover it in himself."

—Galileo Galilei

Message from D. Carr Thompson NSRC Advisory Board Chair

A number of reports—*Rising Above the Gathering Storm* (National Academies), *Innovation America: Building a Science, Technology, Engineering and Math Agenda* (National Governors Association), *Creating Internationally Competitive Schools* (Public School Forum of North Carolina), and many others—acknowledge that America's future depends on maintaining scientific and technological leadership in the global economy. A common theme among these reports is the need to improve science and mathematics education in our schools and inspire America's youth to study and enter these fields.

The National Science Resources Center (NSRC) has spent the past 20-plus years working in the trenches to bring inquiry-based science learning into classrooms across the country and the world and thus engage students in the wonders of science learning. There are a number of success stories where science education reform is taking hold in schools, particularly in Delaware, North Carolina, Pennsylvania, and Washington State. If you read further in this annual report, you will better understand how the NSRC's strategies for systemic reform are impacting change in these states and other countries such as Chile and Sweden. It is a labor of love for the NSRC staff, who work diligently to make science education reform a reality. Sally Goetz Shuler, the leader of this tremendous organization, deserves credit for the foresight, management, and planning of these efforts.

As board chair, I am honored to work with the staff and other members of the board who too are committed to bringing innovative, inquiry-based science learning into each classroom in America. We continue to hear that fewer of our students are pursuing STEM careers and that they are performing at levels far below students in other countries. My response is that our children deserve the best education that we can offer them. If you want to help, join the NSRC as we work to ensure that our students will have the best possible science education as they prepare themselves for the global workforce.

D. Carr Thompson
NSRC Advisory Board Chair

Message from Sally Goetz Shuler
NSRC Executive Director

The year 2006 brought new opportunities for helping develop a new generation of science-literate citizens. The NSRC moved forward on several fronts, as detailed in this report.

We worked with three new states—New York, North Carolina, and Pennsylvania—in initiating or expanding their reform efforts statewide. Our emphasis in New York is in the state's five largest urban school districts, and we have begun work as well with education and community leaders in two other urban districts—New Orleans and Houston.

We also raised the profile of the NSRC significantly within our parent organizations. We were asked for the first time to undergo review by the Governing Board of the National Research Council. As the operating arm of the National Academies, the National Research Council is responsible for associating the broad community of science and technology with the Academy's purposes of further knowledge and advising the federal government. This review provided us a unique opportunity for introspection and the development of new perspectives on our work. Also during 2006, the members of the Smithsonian Science Executive Committee asked me to join that group. This is important in that it reflects the growing understanding of the role of science education within the Smithsonian. Working with several Smithsonian units during development of our highly successful Smithsonian Science Education Academies for teachers also enhanced our visibility and reputation within the world's largest museum complex.

As always, none of these and many other accomplishments would have happened without the dedication and hard work of the NSRC staff. Although we are small, we have had a major impact on science education—and our greatest opportunities lie ahead of us. We thank our parent institutions—the National Academies and the Smithsonian Institution—for their continued support, to the members of the NSRC National Advisory Board for their ongoing counsel, and to our partners and sponsors for their sustained commitment to this important work.

Sally Goetz Shuler
NSRC Executive Director

NSRC Mission—Our Primary Purpose

To improve the learning and teaching of science for all students in the United States and throughout the world.

NSRC Core Values—Our Aspirations

Quality

- **Our work is of the highest quality and a standard for excellence.**
- **We bring discipline, cutting-edge knowledge, and critical thinking to our work.**
- **We ensure that our products and services are based on research on how people learn.**
- **We constantly look for ways to raise the bar and increase our impact.**
- **Our products and services undergo a rigorous research and development process.**

Innovation

- **We are self-reliant and provide visionary leadership to achieve results.**
- **We are forward-looking, resourceful, and creative problem solvers.**
- **We encourage risk-taking that leads to new ideas and innovative solutions.**

Impact

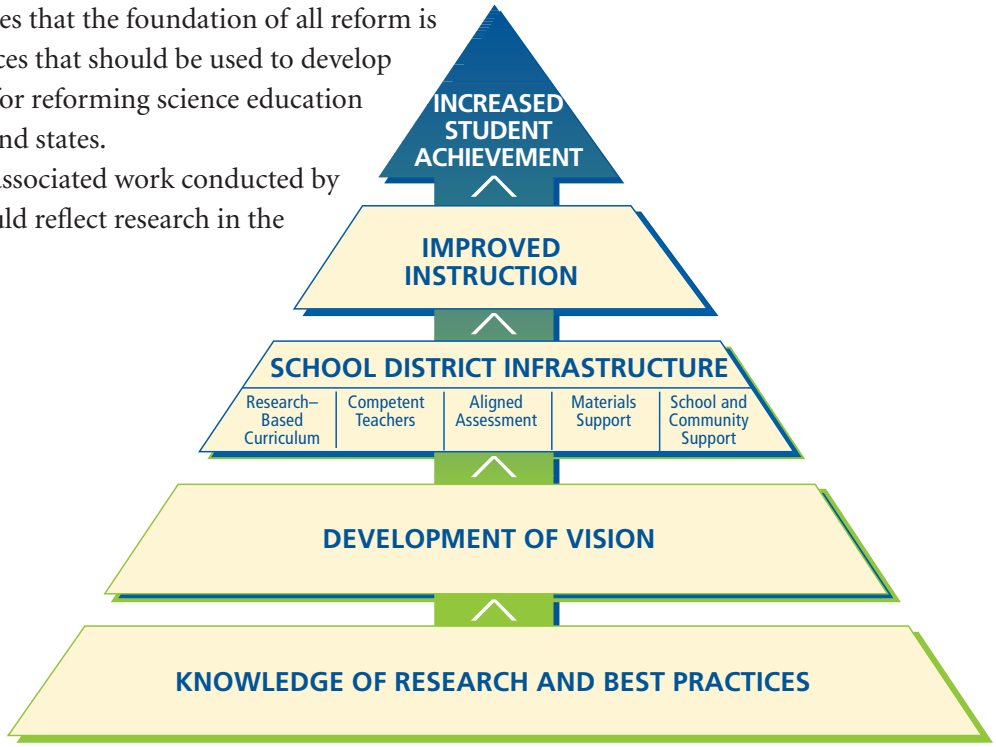
- **We deliver relevant, valuable products and services to our customers.**
- **We are passionate about our mission.**
- **We commit to delivering tangible, measurable results that matter to the world.**

NSRC Theory of Action

The NSRC's Theory of Action advocates that the foundation of all reform is knowledge of research and best practices that should be used to develop a shared vision and an infrastructure for reforming science education programs for all students in districts and states.

The design of the theory and the associated work conducted by informed leaders to implement it should reflect research in the following areas:

- Development of science concepts
- Learning and teaching
- Assessment of learning
- Evaluation of programs
- Systems thinking
- Accountability structures
- Introduction of interventions and the process of change
- Scaling-up principles
- Incentives
- Methods of ensuring sustainability



NSRC Stages of Leadership Development

Successful organizational change for establishing effective K–12 science education programs requires leaders to move through a continuum of knowledge from awareness to informed leadership.

Stage of Reform	Goal	Proposed Strategies
Awareness	Build awareness of research, policies, and best practices for reforming K–12 science education programs.	■ Arrange for presentations at professional meetings of scientists and engineers with the aim of engaging them in the educational reform process. ■ Sponsor annual national symposia to help leaders of business, foundations, government, media, academia, and K–12 education learn in-depth about exemplary district and state efforts for science education reform.
Initiation	Develop the initial knowledge and skills for creating an effective strategic plan for science education reform.	■ Recruit leadership teams for participation in professional development and leadership development experiences such as the NSRC strategic planning institutes. ■ Develop mechanisms for securing financial support for district, state, regional, and national team participation in institutes.
Implementation	Bring about organizational change through implementation of strategic plans.	■ Support full implementation of strategic plans through development of academies, networking opportunities, and related events and services.
Informed Leadership	Lead statewide and national efforts to bring reform to scale.	■ Recruit leaders to serve as faculty for leadership development events such as the NSRC strategic planning institutes. ■ Encourage leaders' active involvement in statewide, regional, and national efforts to improve science education.

Looking Back—Highlights from 2006

The year 2006 saw not only the continuation of existing NSRC programs and services but also new initiatives that promise to expand our role in science education in the coming years. In 2006, the NSRC's many accomplishments included the following:

- **Launched new research activities,** including a major initiative with Vanderbilt University to test the use of models as a way for students to develop conceptual understanding of biology. *See page* **7**.
- **Advanced the public understanding of science education** by building awareness among leaders throughout the public and private sectors in the United States of the need to redesign and improve K–16 science programs. *See page* **8**.
- **Expanded and sustained science education reform efforts** through initiatives for . . .

. . . **building leadership capacity** for science education reform in school districts by guiding leadership teams in strategic planning and by enhancing teachers' leadership skills. *See page* **9**.

. . . **engaging urban communities and new states**—notably in New York, North Carolina, and the storm-ravaged Gulf Coast region—in the implementation of best educational practices. *See page* **10**.

. . . **supporting the professional growth of teachers of science,** including an expansion of the NSRC's award-winning Smithsonian Science Education Academies for Teachers. *See page* **11**.

. . . **extending the NSRC's model for science education reform into high school** through partnerships for improving pre-service teacher preparation. *See page* **12**.

. . . **making exemplary, research-based science education resources available** for classroom use. *See page* **13**.

Scaling Up and Sustaining Effective Science Education Programs in School Districts and States

The NSRC has developed processes, services, and products to help districts, states, and regions build and sustain effective science programs. These efforts require local leadership that will champion systemic change, be committed to a long-term process, base their work on research and promising practices, and use evidence to evaluate the impact of their work.

During 2006, the NSRC continued to base its work on research on learning and teaching, expanded its outreach program for building awareness among leaders for a new way of learning and teaching science in schools, continued developing leadership capacity for science education reform in school districts and for teacher professional development, disseminated exemplary science instructional materials, and worked internationally to improve the learning and teaching of science in all corners of the globe.

Supporting and Disseminating Research to Advance Best Practices

The basis for all of the NSRC's work is rigorous research on how children learn and on theories of organizational change. The NSRC applies research and best practices to the development and continuous improvement of all its programs and services, from its theory of action for systemic science education reform, to its award-winning professional development offerings, to its exemplary K–8 curriculum.

The NSRC is committed to developing a robust body of literature on the effectiveness of research-based science programs and materials, and on leadership development. Ongoing evaluation of NSRC programs and activities complements the research, informs decisions by NSRC leadership on the development and delivery of activities, and provides data on program impact and progress.

Following are brief summaries of two research activities supported by the NSRC, and plans for expansion of this activity.

Surveyed School District Curriculum Adoption Practices

The NSRC contracted with Georgetown University to conduct a survey on science curriculum use among the more than 700 U.S. school districts that have participated in NSRC strategic planning institutes. The research team found that the overwhelming majority of the participating school districts adopted and continue to use exemplary research-based science instructional materials.

Entered into a Research Partnership with Vanderbilt University

Vanderbilt University is nationally recognized for its research in the learning and teaching of science. In 2006, the NSRC entered into a four-year partnership with Vanderbilt on a study that will test the use of models as a way for students to develop conceptual understanding of biology, using the biology strand of the NSRC's curriculum. The project,

"Development of Model-Based Reasoning," is funded by the National Science Foundation.

Researchers will be working with test sites in Walla Walla, Washington, and Nashville, Tennessee. The NSRC will support this effort by providing:

- NSRC staff expertise in terms of planning, facilitating, and conducting project activities;
- NSRC instructional materials and consultation on professional development opportunities and student activities;
- Professional development for participating teachers at the test sites; and
- Dissemination of results to the NSRC's broad network of science education leaders.

Looking Forward

In 2007, the NSRC will commission research on the implem entation of the statewide science education reform effort in North Carolina. The study will examine administrator and teacher attitudes necessary for successful systemic reform. The NSRC will also initiate research partnerships with the goal of completing a randomized control study of the efficacy of the NSRC's STC PROGRAM™ materials. In addition to expanding its capacity to support research, in 2007 the NSRC will strengthen the research section of its Web site.

Improving Public Understanding of Science Education

A broad base of support for science education is essential for successfully establishing and sustaining research-based science programs in schools. The NSRC seeks to increase public understanding of science education by engaging wide-ranging communities of stakeholders—educating them about the importance of science education and involving them in active reform movements that will change the course of science education.

Engaged Key Stakeholders in Science Education Reform

During 2006, the NSRC strengthened its series of conferences designed to increase awareness of a new paradigm for science education. These conferences will foster increased involvement of a broad spectrum of leaders in science education programs at the local, statewide, regional, and national levels. Conducted under the theme "Changing the Course of Science Education," these conferences will engage leaders from business, foundations, government, higher education, and K–12 education. The NSRC is committed to holding, at a minimum, two such conferences annually.

The first conference in this series, "Changing the Course of Science Education: 2006 Symposium for Key Stakeholders in America's Future," attracted more than 100 leaders to Washington, D.C., in October 2006.

Expanded the Reach of the NSRC Web Site

The NSRC Web site, ***www.nsrconline.org***, is maintained by the NSRC's Communications and Publications Division. The site highlights research and science education resources for a wide audience, including school districts, teachers, students, parents, corporations, and foundations. It provides details on the impact of the NSRC's work; links to the National Academies Web site, including specific research studies related to science learning and teaching; and links to the Smithsonian Institution and other museums, science centers, and other resources.

During 2006, the NSRC's Web site received almost 650,000 site visits, more than double the number from the previous year. About 23 percent of the visits were international, more from China than any other nation. The pages most visited beyond the site's home page were for information on curriculum and professional development.

Told the NSRC's Story by Exhibiting at Conferences

The NSRC's Communications and Publications Division took the lead again in 2006 in exhibiting at major national and regional events. Between the NSRC booth at the April 2006 National Science Teachers Association National Conference on Science Education in Anaheim, California, and its exhibit at the October 2006 Smithsonian Teacher's Night in Washington, D.C., the NSRC provided information and materials to more than 1,000 teachers and school administrators. Many of these visitors have remained in contact with the NSRC, and several have begun to work with the NSRC as a result of the contact.

Looking Forward

During 2007, the NSRC plans to establish a new center of excellence dedicated to improving public understanding of science education. As part of this initiative, the NSRC is planning to hold two or more national "Changing the Course of Science Education" conferences during 2007. One of these will be a special conference in the Gulf Coast with major support from the Shell Exploration & Production Company. The NSRC, Shell, and other partners are planning a major initiative to engage science-based organizations in rebuilding science education programs in the Gulf Coast region following the devastating storms of 2005. A broad coalition of corporations and organizations is expected to support the initiative. In addition, the Public Understanding Committee of the NSRC National Advisory Board has taken an active role in an initiative to engage leaders in professional organizations and business in science education reform efforts.

Using Systems Thinking and Strategic Planning to Advance Best Practices

The NSRC works with school district leaders to help them develop the expertise and support needed to develop five-year strategic plans for establishing comprehensive and challenging K–12 science programs for all students. The NSRC then provides follow-up technical assistance in partnership with government, industry, the education community, and parents to help school districts establish, sustain, and continuously improve the infrastructure needed to support high-quality instruction for all students.

Guided School Districts in Strategic Planning for Science Education Reform

The NSRC conducted three national strategic planning institutes between late 2005 and the end of 2006. These institutes, the NSRC's signature events for initiating science education reform programs, guide school district leadership teams through the process of developing tailored strategic plans for initiating research-based science programs.

Two institutes aimed at middle schools were conducted. Ten leadership teams from five states and Trinidad and Tobago participated in an institute in St. Louis, Missouri, in December 2005, and 11 teams from nine states participated in an institute in Birmingham, Alabama, in December 2006.

In addition, the National LASER K–8 Science Education Strategic Planning Institute, held in Arlington, Virginia, in July 2006, hosted 11 U.S. teams plus international teams from Indonesia, Thailand, and the United Kingdom. Total enrollment in the U.S. school districts and independent schools that attended the institute is approximately 275,000 students.

Established New Partnerships for Reform

New York. In September 2006, the NSRC began an 18-month agreement with the New York State Education Department to provide consultation services to the school districts of the five largest school districts in the state (New York City, Buffalo, Rochester, Syracuse, and Yonkers). The NSRC is assisting these school districts in all aspects of science education reform.

North Carolina. The NSRC entered into an agreement with the Burroughs Wellcome Fund and the North Carolina Science, Mathematics, and Technology Education Center to provide, over the next ten years, planning and follow-up assistance to all North Carolina school districts. This initiative was made possible through a generous $1 million gift from the Burroughs Wellcome Fund.

New Orleans and Houston. Supported by the Shell Exploration & Production Company, the NSRC initiated partnerships to strengthen the science education programs of public schools in New Orleans and Houston. These efforts build on the long-standing commitment of Shell to its communities, and to the rebuilding of the Gulf Coast after Hurricanes Katrina and Rita.

Pennsylvania. With assistance from the NSRC, Pittsburgh-based ASSET Inc., a long-time partner with the NSRC, conducted two strategic planning institutes for Pennsylvania school districts—in Pittsburgh in August for the western part of the state, and in King of Prussia in October for the eastern part. These institutes are part of a statewide reform strategic plan, supported by the governor, to reach every school district in the state has participated.

Initiation and Implementation of Science Education Reform

Initiation of Reform		Implementation of Reform and Building Learning Networks
NATIONAL	**REGIONAL**	**NATIONAL**
December 2005 National LASER Middle School Science Education Planning Symposium St. Louis, MO	**June 2006** Washington State LASER K–8 Science Education Strategic Planning Institute Everett, WA	**April 2006** NSRC Leadership Working Symposium Anaheim, CA
July 2006 National LASER K–8 Science Education Strategic Planning Institute Arlington, VA	**August 2006** Pennsylvania LASER K–8 Science Education Strategic Planning Institute Pittsburgh, PA	**April 2006** NSRC/NSTA Professional Development Institute: Developing Leadership Capacity to Sustain Change Anaheim, CA
October 2006 Changing the Course of Science Education: A Symposium on Science Education for Key Stakeholders in America's Future Washington, DC	**October 2006** Pennsylvania LASER K–8 Science Education Strategic Planning Institute King of Prussia, PA	**April 2006** NSRC/Merck Institute for Science Education Annual Showcase of New Science Education Resources Anaheim, CA
December 2006 National LASER Middle School Science Education Planning Symposium Birmingham, AL	**October 2006** New York State LASER PreK–12 Science Education Building Awareness Leadership Conference Albany, NY	

Enhanced Teachers' Leadership Skills

The NSRC was invited to present a professional development institute during the National Science Teachers Association National Conference on Science Education in Anaheim, California, in April 2006. The NSRC program focused on developing leadership capacity to sustain change. During the institute, participants looked closely at the competencies needed for leadership in championing a transition to an inquiry science program and learned how to create an environment for implementing, nurturing, and sustaining change. Approximately 40 science teachers and administrations from throughout the United States attended the program.

Looking Forward

During 2007, the NSRC will continue statewide and regional reform programs in New York State, Pennsylvania, North Carolina, and the Gulf Coast. In addition, the NSRC will offer strategic planning to individual school districts from across the country and around the world at its annual National K–8 Strategic Planning Institute.

Employing Best Practices to Support the Professional Growth of Teachers

High-quality professional development for all teachers of science is essential for effective science education. As teachers' understanding of science and pedagogy increases, they become more able to engage young minds in the sciences. Research supports the hypothesis that professional development contextualized to the curriculum that teachers are using will be more effective in contributing to student learning.

Conducted Two Summer Academies for Science Teachers

In July 2006, the NSRC's Professional Development Center conducted two Smithsonian Science Education Academies for Teachers—a physical science academy, *Energy and Motion,* and a life science academy, *Biodiversity.* The academies guided teachers through focused investigations reinforced with behind-the-scenes visits with curators and research scientists from the Smithsonian and other local science organizations. Each of the 63 teachers who attended developed a greater appreciation for the science education resources of the Smithsonian and will affect the learning of an estimated 125 students per teacher every year.

The Smithsonian Women's Committee awarded the 2006 Smithsonian Education Innovation Award to the Professional Development Center in recognition of the creativity, excellence, and commitment to serving the nation through this unique professional development program.

Continued Support for University-Based Professional Development Opportunities

Centers for Science Teaching and Learning. The NSRC continued its support for two university Centers for Science Teaching and Learning, at Rider and Montclair State Universities in New Jersey. Both centers are funded by Bristol-Myers Squibb. One highlight of this work, in March 2006 at Rider University, was an NSRC-conducted seminar on building awareness of inquiry science. This event attracted 38 teachers and school administrators, who left the training with improved knowledge of science, enhanced teaching skills, and a deeper understanding of inquiry science education programs. Through improved teacher classroom performance, this workshop alone affects 90 children per teacher annually.

New University Partnership for High School Science. In 2006, the NSRC's Professional Development Center entered into a partnership with the American Society of Human Genetics and the National Association of Biology Teachers on an initiative to strengthen the capacity of university faculty to participate in K–12 education. Through professional development products and services, the Center will help create a sustainable infrastructure for supporting exemplary high school genetics education. This work, which will begin in 2007, is made possible through a grant from the National Science Foundation.

Looking Forward

The NSRC will double the number of its award-winning summer science academies for teachers in 2007. In collaboration with other Smithsonian units, it will add *Ecological Field Studies* and *Electricity and Magnetism* academies to its program mix. In addition, the NSRC's Professional Development Center will continue or initiate educational projects with the Smithsonian's National Museum of Natural History, Smithsonian National Zoological Park, and the Smithsonian Associates.

Supporting the Development and Dissemination of Research-Based Science Instructional Materials

Research-based science instructional materials (see R&D Process chart at right) are the foundation of effective science programs. The NSRC spent 18 years developing and updating a comprehensive science program for children in kindergarten through grade nine (the STC PROGRAM™). Additionally, the NSRC disseminates other exemplary science curricula that meet the highest standards of research and development.

Developed Web-Based Supplemental Materials for Students

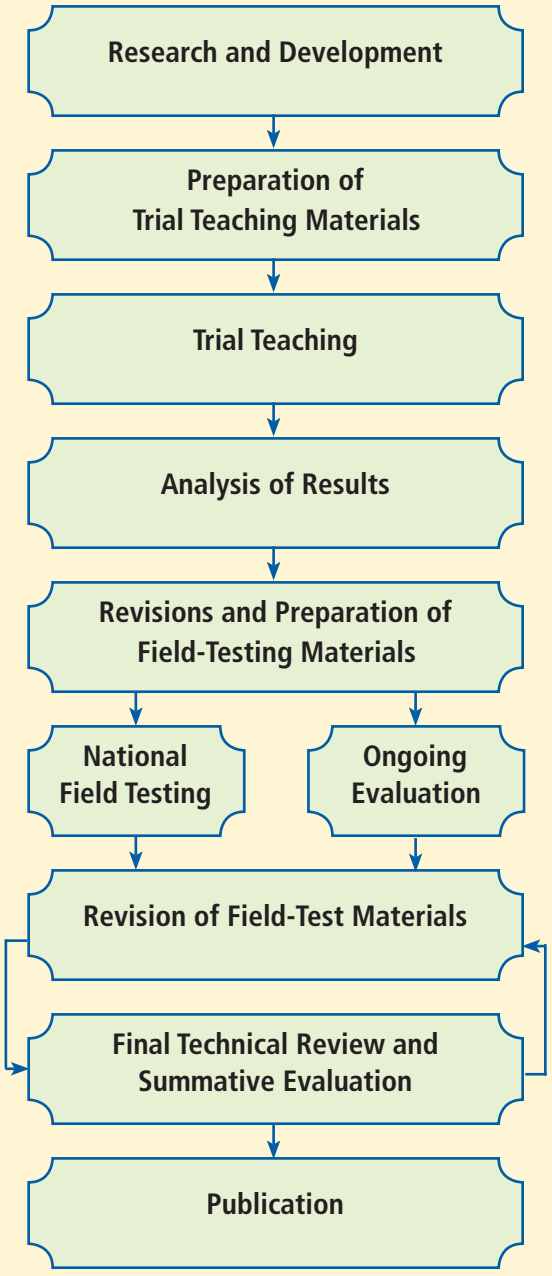
The NSRC completed trials for its new Internet-based reading complement to its middle school curriculum module *Properties of Matter.* The trials, conducted in two public school districts in Oklahoma, indicated that students who had access to the Web-based resources outperformed those who did not on several standardized tests. The study suggests that linking student class activities directly to interactive reading may engage students successfully in meaningful and purposeful reading.

The goal of this new product—the Electronic Literacy Supplement—is to enhance student learning and interest in science by providing online reading selections and links to Web-based resources from the Smithsonian and other sources, all the while promoting science literacy and presenting practical, real-world application of science concepts. These materials will provide home access for students to reading materials, and will accommodate different learning styles, including English-language learners. This project was developed under a Smithsonian Innovation grant.

Disseminated Research-Based Instructional Materials

STC PROGRAM Courses. Of the 22 states that have statewide textbook adoption requirements, 14 states now include STC PROGRAM materials in their list of approved curricula. Three states—Alabama, Oklahoma, and West Virginia—added STC to their approved list in 2006. The NSRC's publisher, Carolina Biological Supply Company, reports that between October 1, 2005, and December 31, 2006, the courses most purchased for use in elementary classrooms were the fourth-grade physical science unit *Motion and Design* and the second-grade life science unit *The Life Cycle of Butterflies.* At the secondary level, the life science module *Organisms—From Macro to Micro* and the earth science module *Catastrophic Events* were the most purchased.

The STC PROGRAM Research and Development Process



NSRC-Supported Curriculum Programs That Meet the NSRC's Criteria

BSCS CENTERS FOR CURRICULUM DEVELOPMENT PROFESSIONAL DEVELOPMENT RESEARCH AND EVALUATION

Biological Sciences Curriculum Study of Colorado Springs, Colorado, publishes the K–16 BSCS science curricula.

FOSS

SEPUP Issue-Oriented Science

Lawrence Hall of Science at the University of California, Berkeley, publishes the K–12 Full Option Science System (FOSS) and the K–6 Science Education for Public Understanding Project (SEPUP).

Science & Technology STC for Children

Science & Technology Concepts STC/MS for Middle Schools

Carolina Biological Supply Company, Burlington, North Carolina, publishes the K–6 Science and Technology for Children (STC®) and the 6–8 Science and Technology Concepts for Middle Schools (STC/MS™) curricula.

Other Research-Based Curricula. Under its original grant from the National Science Foundation (NSF), the NSRC's LASER Center partnered with other NSF-funded projects and curriculum developers to disseminate curriculum that exemplified best practices of learning and teaching. Although the LASER Center is no longer supported by the NSF, the NSRC ensures that all materials it showcases (see chart at left) meet the following criteria.

- Does the material address the important goals of elementary science teaching and learning?
- Does the material focus on inquiry and activity as the basis of learning experiences?
- Are the modes of instruction developmentally appropriate?
- Is the science content accurate and current, and does it lead to an understanding of basic principles?
- Is the material interestingly presented, and does it facilitate understanding?
- Is the material well organized, and is it easy and safe for both teacher and students to use?
- Is the material free of cultural, racial, ethnic, gender, and age bias?

Disseminated Children's Books. By the end of 2006, the NSRC had reprinted ten of the 12 titles in its grade four through six STC BOOKS series. The series, originally released in 2004, complements the NSRC's upper elementary science curriculum and provides a strong literacy component to the NSRC's curriculum portfolio. The series is unique in that many of the articles in each book feature Smithsonian scientists, research, and collections. Use of these books in the classroom links science reading selections with other areas of the curriculum, especially history, social studies, and language arts. An additional four titles targeted to third graders are expected to be available for classroom use during 2007.

Looking Forward

Prior to developing additional children's books, the NSRC conducted a study with teachers and students in lower elementary school to determine their needs and interests. The new books, like the existing books for grades four through six, will highlight the collections, scientists, and research of the Smithsonian Institution. Look also for the NSRC to move forward with preparation of science instructional materials for high schools.

Developing and Strengthening International Capacity

The NSRC extends its work internationally through the National Academies and the InterAcademy Panel (IAP). The IAP is a global consortium of 95 national science academies. Its core function is to build the capabilities of science academies in all countries, especially in the developing world. Through the IAP, the NSRC works with international groups to:

- Build awareness for a new vision of effective science learning and teaching, and for the required support systems;
- Share national and international experiences;
- Highlight the responsibilities and roles of scientists and engineers;
- Explore the role of science academies in science education reform; and
- Identify strategies for international cooperation in this endeavor.

Science education is an important issue that transcends national boundaries. Because science underpins much economic prosperity globally, it is in our national interest to engage with other countries in creating a shared knowledge base that will lead to economic prosperity and increased innovation for all. Thomas Jefferson once said, "Freedom is the first-born daughter of science;" by promoting better science education, we are building a foundation for freedom everywhere.

During this past year, the NSRC played a leadership role in improving K–16 science education throughout the world in three ways.

Improved Public Understanding of Science Education in Other Countries

The NSRC's Executive Director, Sally Goetz Shuler, addressed more than 500 leaders on the role of women in science education and on human rights at the Third Science and

Technology in Society Forum, held in Kyoto, Japan, during September 2006. She emphasized the importance of making science education accessible to all students, regardless of gender, to strengthen democracy and national economic well-being.

Developed Leadership Capacity for Science Education Reform Abroad

Europe. The NSRC helped plan and participated in the Second European Conference on Primary Science and Technology Education, "Science is Primary II." This conference, held at the Royal Swedish Academy of Sciences in Stockholm in September 2006, built upon a similar conference held in October 2005, also in Stockholm. At the 2006 conference, the NSRC's Executive Director made a presentation on lessons learned from two decades of systemic science education reform.

Central America. This past year, the NSRC conducted a K–8 Science Education Strategic Planning Institute in Hidalgo, Mexico, for teams representing 11 Mexican states. The institute was conducted in partnership with the U.S.-Mexico Foundation for Science.

Africa. Plans are underway to work with the IAP to hold a leadership development

conference in Nairobi, Kenya, for teacher leaders from ten African countries in April 2007.

Middle East. The NSRC is working with the Qatar Institute and the Qatar Foundation on the possibility of conducting an NSRC K–8 Science Education Strategic Planning Institute in the summer of 2007.

Australia. During the summer of 2007, the NSRC will begin working with leaders from Queensland, Australia, to help them advance science education. Richard Johns, Associate Professor of Analytical and Environmental Chemistry at Griffith University, Queensland, will join the NSRC staff as a Smithsonian/Queensland fellow for six months.

Strengthened Other Countries' Evaluation Capabilities

The NSRC's participation in the 2005 International Conference on the Evaluation of Inquiry-Based Science Education Programmes in Stockholm, Sweden, helped lay the groundwork for further work with the IAP by the National Research Council's Board on Science Education (BOSE). BOSE prepared an evaluation framework for use in countries committed to science education and present its final document at an international meeting held in Santiago, Chile, during which the NSRC presented its perspectives and recommendations.

Looking Forward

In April 2007, Ms. Shuler will address the U.S.–Mexico Foundation for Science Board of Governors on the importance of investing in science education at their meeting in Washington, D.C. The NSRC is also working with the U.S.–Mexico Foundation for Science to plan the fourth biennial international conference on science education—"Science and Well-Being . . . From Amazement to Citizenship"—in Monterrey, Mexico, to be held in November 2007.

Managing for Excellence—Administration and Finance

Transparent management and a stable funding base for NSRC programs and operations will help the organization maintain and expand its portfolio of products and services for science education. Gifts, grants, fee-for-service revenues, curriculum royalties, publication sales, and contributions from the National Academies and the Smithsonian—and the NSRC's commitment to careful stewardship of all its resources—will allow the organization to grow during the years to come.

Management Initiatives

Reported to National Research Council Governing Board. In February 2006, the NSRC made its first report to the National Research Council Governing Board on past activities and future plans. The report provided an opportunity not only to inform the Board about the NSRC's work but also to receive feedback and direction that will improve the NSRC's management and focus its strategic planning. The NSRC looks forward to its next opportunity to report to the board.

Invited to Join Smithsonian Science Executive Committee. Recognizing the important and growing role of science education within the mission of the Smithsonian Institution, the heads of the Smithsonian science units—museums and research facilities—asked the NSRC Executive Director, Sally Goetz Shuler, to join the Institution's Science Executive Committee. The invitation gives the NSRC a place at the table during pan-institutional science discussions.

Expanded Intern Program. During fiscal year 2006, the NSRC employed 13 high school, undergraduate, and graduate students in internship positions throughout the staff—more than ever before. The students received mentoring from the NSRC's professional staff and contributed significantly to achievement of NSRC goals. The names of these interns are included in the staff list on page 24.

NSRC Quasi-Endowments

The NSRC made substantial progress in building a funding base for core operations and development activities through the existing quasi-endowment at the National Academies and the addition of a new quasi-endowment at the Smithsonian. In early 2006, the NSRC deposited $56,500 in the newly created Smithsonian account while the National Academies account grew to more than $6.2 million. The NSRC is on pace to reach its goal of surpassing $10 million in these funds by 2011.

During fiscal year 2007, the NSRC plans to open a third quasi-endowment with its $1 million grant from the Burroughs Wellcome Fund and a matching $1 million transfer from the quasi-endowment at the National Academies. Earnings from this new account will not only support K–12 program activities in North Carolina public schools over a ten-year span but also build a program reserve fund.

Projections in the tables on the next page are based on an annual return of eight percent on investment.

National Academies Quasi-Endowment

	Year	Deposits	Interest Earned	Withdrawals	Ending Balance
Actual	2004	$3,395,238	$383,843	$0	$3,779,081
	2005	584,106	444,294	0	4,807,481
	2006	500,000	929,762	0	6,237,243
Projections	2007	507,130	459,550	1,000,000	6,203.923
	2008	500,000	536,314	0	7,817,262
	2009	500,000	619,219	0	8,982,643
	2010	500,000	708,756	0	10,241,255
	2011	500,000	766,837	478,411	11,600,555

Smithsonian Institution Quasi-Endowment

	Year	Deposits	Interest Earned	Ending Balance
Actual	2006	$56,500	$4,509	$61,009
Projections	2007	150,000	10,550	221,560
	2008	300,000	26,078	547,638
	2009	600,000	57,382	1,205,020
	2010	1,000,000	110,251	2,315,271
	2011	1,000,000	165,764	3,481,034

Smithsonian Institution Quasi-Endowment, North Carolina Public Schools K–12 Science Education Initiative

	Year	Deposits	Interest Earned	Withdrawals	Ending Balance
Projections	2007*	2,000,000	$80,000	$0	$2,080,000
	2008		166,400	0	2,246,400
	2009		179,712	100,000	2,326,112
	2010		186,089	100,000	2,412,201
	2011		192,976	100,000	2,505,177
	2012		200,414	100,000	2,605,591
	2013		208,447	100,000	2,714,038
	2014		217,123	100,000	2,831,162
	2015		226,493	100,000	2,957,655
	2016		236,612	100,000	3,094,267

*Account is expected to be established midway through the fiscal year. Therefore, earnings will be less than the normal 8% projection.

Fiscal Year 2006 Operations

The NSRC received $3.9 million for FY 2006 from the Smithsonian and the National Academies; the National Science Foundation; private foundations, corporations, and individuals; fees from school districts; royalties from the sale of its curriculum materials; and revenues from the sale of its children's books. See the table on pages 21 and 22 for details.

Operations

The NSRC received slightly more than $2.5 million to support operations during FY 2006, including $557,000 in deposits to the NSRC quasi-endowments and $1,067,000 for administrative oversight and financial operations. **The Communications and Publications Division** received $161,000 from the federal budget and Smithsonian Trust funds plus $575,000 from the sale of publications. **The Development Division** used $146,000 from the royalty fund at the National Academies to support staff salaries and related expenses.

NSRC Centers of Excellence

The LASER Center received $814,000 in gifts, grants, and registration fees in FY 2006. Gifts from corporations and foundations included $500,000 from the Shell Exploration & Production Company for use in FY 2006 and FY 2007, $75,000 from Bristol-Myers Squibb, and $25,000 from the Merck Institute for Science Education. The LASER Center was awarded $10,000 from the Education Development Center (EDC) for their part of an NSF-funded program to explore lessons learned from NSF's former Implementation and Dissemination Centers. The LASER Center also received a $70,000 grant from ASSET Inc. for strategic planning services, of which $11,666 was received during FY 2006. Finally, the LASER Center completed negotiations on an 18-month, $606,000 contract with the New York State Education Department, which will begin in FY 2007. The Center will receive a $1 million grant from the Burroughs Wellcome Fund during FY 2007 to support program activities in North Carolina public schools.

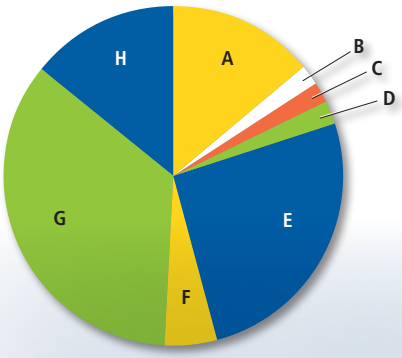
The Professional Development Center received $275,000 in gifts, grants, and registration fees. Gifts from corporations and foundations included $75,000 from the Lucent Technologies Foundation, $75,000 from Bristol-Myers Squibb, and $5,000 from the DC Youth Investment Trust Corporation. The Professional Development Center received $7,500 from the Smithsonian Institution as a recipient of the Institution's 2006 Education Innovation Award competition. The Center also received notice of a $222,593 award from the National Science Foundation for a three-year collaborative project with the American Society of Human Geneticists (ASHG) and the National Association of Biology Teachers (NABT). This project, "Geneticist-Educator Network of Alliances" (GENA), will begin in FY 2007.

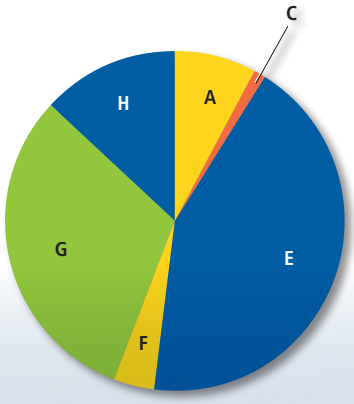
The Curriculum Development Center withdrew $211,000 from the NSRC royalty fund at the National Academies to support the STC BOOKS development project and revisions to the STC/MS curriculum.

The NSRC received $23,621 from Vanderbilt University as part of its NSF-funded "Development of Model-Based Reasoning" initiative, the first installment of an anticipated total of $153,000 for this four-year project. The NSRC also received $5,500 of support from individuals.

Looking Forward

In 2007, the NSRC will seek to fill three critical positions: Deputy Director, Assistant Director for Administration and Finance, and Director of Development. Filling these three positions will streamline the NSRC's management and improve the organization's financial stability. The NSRC plans to continue building its quasi-endowment fund to provide future support for core operations.





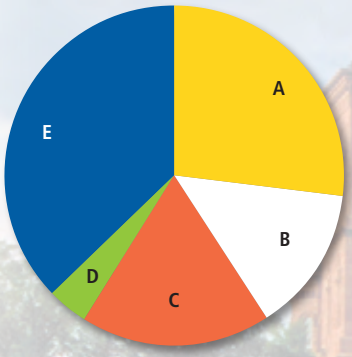
Sources of Funding

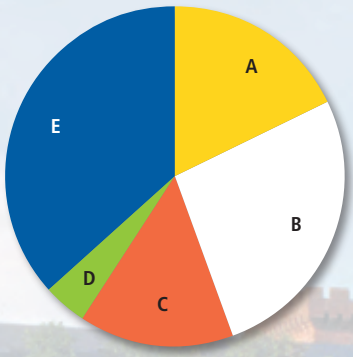
Actual, FY 2006

$552,000	14%	
78,000	2%	
87,000	2%	
80,000	2%	
1,016,000	26%	
194,000	5%	
1,388,000	35%	
575,000	14%	
$3,970,000	**100%**	

Projected, FY 2007

460,000	8%	**A.** Smithsonian General Trust
0	0%	**B.** Smithsonian Federal
66,000	1%	**C.** Smithsonian Indirect
0	0%	**D.** National Academies Indirect
2,510,000	43%	**E.** Gifts and Grants
212,000	4%	**F.** Event Fees
1,841,000	31%	**G.** Royalties
775,000	13%	**H.** Sale of Publications
$5,864,000	**100%**	**TOTAL**





Allocation of Resources

Actual, FY 2006

$1,067,000	27%	
557,000	14%	
736,000	18%	
146,000	4%	
1,464,000	37%	
$3,970,000	**100%**	

Projected, FY 2007

1,029,000	18%	**A.** Administrative Oversight and Financial Operations
1,574,000	27%	**B.** Savings Deposit
889,000	15%	**C.** Communications and Publications
219,000	4%	**D.** Development
2,153,000	37%	**E.** Programs
$5,864,000	**100%**	**TOTAL**

NSRC Operations and Programs

All amounts in $000s

NSRC Savings: Endowment Deposits	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Actual)	FY07 (Projected)
Smithsonian Institution						
Deposits for Smithsonian Institution Endowment	N/A	N/A	N/A	N/A	57	67
Deposits for Burroughs Wellcome Fund Endowment	N/A	N/A	N/A	N/A	N/A	1,000
National Academies						
Royalty Fund Deposit for NAS Endowment	N/A	N/A	3,395	584	500	507
Subtotal	**$0**	**$0**	**$3,395**	**$584**	**$557**	**$1,574**
Administrative Oversight & Financial Operations						
Smithsonian Institution						
Federal	N/A	N/A	N/A	146	N/A	N/A
General Trust (2)	287	279	292	305	469	371
Indirect Cost Budget	403	410	466	66	87	66
National Academies						
Indirect	77	81	80	80	80	N/A
Royalty Fund	120	20	68	330	431	592
Subtotal	**$887**	**$790**	**$906**	**$927**	**$1,067**	**$1,029**
Communications & Publications Division						
Smithsonian Institution						
Federal	161	167	171	141	78	N/A
General Trust	N/A	N/A	N/A	N/A	83	89
Indirect	63	59	N/A	N/A	N/A	N/A
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A
National Academies						
Royalty Fund	43	162	342	296	N/A	N/A
Sale of Publications	N/A	N/A	N/A	N/A	575	775
Science and Technology for Children® Curriculum Revisions						
National Academies						
Royalty Fund	N/A	193	110	N/A	N/A	25
Science and Technology Concepts For Middle Schools™ Curriculum Development Project						
Smithsonian Institution						
Federal & State Grants	187	N/A	N/A	N/A	N/A	N/A
Science and Technology For Children BOOKS™ Development Project						
Smithsonian Institution						
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A
National Academies						
Kellogg Grant	N/A	N/A	N/A	N/A	N/A	N/A
Royalty Fund	N/A	500	N/A	N/A	N/A	N/A
Subtotal	**$454**	**$1,081**	**$623**	**$437**	**$736**	**$889**
Development Division						
National Academies						
Royalty Fund	N/A	99	105	110	146	219
Subtotal	**$0**	**$99**	**$105**	**$110**	**$146**	**$219**
Total Support	**1,341**	**1,970**	**5,029**	**2,058**	**2,506**	**3,711**

All amounts in $000s

NSRC Center for Building Awareness	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Actual)	FY07 (Projected)
Smithsonian Institution						
Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	N/A	200
Subtotal	**$0**	**$0**	**$0**	**$0**	**$0**	**$200**
NSRC Leadership and Assistance for Science Education Reform (LASER) Center						
Smithsonian Institution						
Federal & State Grants	1,318	628	774	526	568	474
Gifts & Non-Federal & State Grants	615	647	331	270	144	515
Event Fees[1]	293	145	61	85	102	117
National Academies						
National Research Council Grant	N/A	N/A	N/A	N/A	N/A	N/A
Royalty Fund	177	N/A	N/A	N/A	N/A	100
Subtotal	**$2,403**	**$1,420**	**$1,166**	**$881**	**$814**	**$1,206**
NSRC Curriculum Development Center						
Science and Technology for Children® Curriculum Revisions						
National Academies						
Royalty Fund	N/A	376	199	N/A	N/A	N/A
Science and Technology for Children BOOKS™ Development Project						
Smithsonian Institution						
Gifts & Non-Federal & State Grants	N/A	N/A	30	N/A	N/A	N/A
National Academies						
Kellogg Grant	N/A	N/A	N/A	50	N/A	N/A
Royalty Fund	N/A	N/A	360	65	111	148
Science and Technology Concepts for Middle Schools™ Curriculum Development Project						
Smithsonian Institution						
Federal & State Grants	133	N/A	N/A	N/A	N/A	N/A
Gifts & Non-Federal & State Grants	295	N/A	N/A	N/A	N/A	N/A
Science and Technology Concepts for Middle Schools™ Curriculum Revisions Project						
National Academies						
Royalty Fund	N/A	N/A	N/A	N/A	100	100
Subtotal	**$428**	**$376**	**$589**	**$115**	**$211**	**$248**
NSRC Professional Development Center						
Smithsonian Institution						
Federal & State Grants	N/A	N/A	N/A	N/A	14	97
Gifts & Non-Federal & State Grants	N/A	25	80	224	169	133
Event Fees	N/A	5	45	78	92	95
National Academies						
Kellogg Endowment Fund	N/A	149	N/A	N/A	N/A	N/A
Royalty Fund	N/A	300	200	100	N/A	100
Subtotal	**$0**	**$479**	**$325**	**$402**	**$275**	**$425**
NSRC International Division						
Smithsonian Institution	N/A	N/A	N/A	N/A	N/A	N/A
National Academies Gift	N/A	N/A	N/A	20	64	N/A
Subtotal	**$0**	**$0**	**$0**	**$20**	**$64**	**$0**
NSRC Center for Research & Evaluation						
National Academies						
Federal & State Grants	N/A	N/A	N/A	N/A	N/A	24
Royalty Fund	N/A	N/A	N/A	N/A	100	50
Subtotal	**$0**	**$-**	**$-**	**$-**	**$100**	**$74**
Total Program Support	**2,831**	**2,275**	**2,080**	**1,418**	**1,464**	**2,153**
Overall Total	**4,172**	**4,245**	**7,109**	**3,476**	**3,970**	**5,864**

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An asterisk (*) next to a board member's name indicates that his or her term on the board ended during the period October 2005 through December 2006.

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The challenge of redesigning and improving science education programs for all children requires dedicated leadership and a long-term commitment to quality science education on the part of our staff, our parent institutions, our National Advisory Board, and numerous sponsors and partners who have contributed materially and substantially to the NSRC's efforts.

Sponsors

The following organizations and individuals have contributed financial and in-kind support for NSRC programs and services during the past three years.

Public Sector Agencies

National Science Foundation

Corporations and Foundations

Diane and Norman Bernstein Foundation
Bristol-Myers Squibb
Burroughs Wellcome Fund
Carolina Biological Supply Company
DC Children and Youth Investment Trust Corporation
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The following organizations have worked closely with the NSRC in the delivery of programs and services over the past three years.

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www.nsrconline.org

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Smithsonian Institution