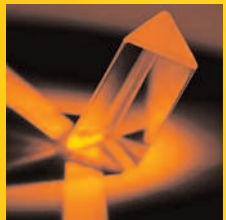
National Science Resources Center

THE NATIONAL ACADEMIES Smithsonian Institution

2005 ANNUAL REPORT

Delivering Excellence in Science Education



In Recognition

S. ANDERS HEDBERG
Director, Bristol Myers Squibb Foundation, Inc.

This report is dedicated to Anders Hedberg, whose six-year term as chair of the National Science Resources Center's National Advisory Board ended during 2005.

Dr. Hedberg's vision, dedicated leadership, and sustained commitment to reforming science education in the United States have inspired our staff, our Board, our parent institutions, and hundreds of educators and scientists. We would like to express our deepest gratitude to Dr. Hedberg for his work in advancing the NSRC's mission and for serving as an extraordinary ambassador for the organization.

TABLE OF CONTENTS

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, as well as an opportunity to engage and catalyze educators, business people, and scientists in all aspects of science education reform.

The Smithsonian Institution was established in 1846 with a mission of increasing and diffusing knowledge. For 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.

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

- Making their work accessible by translating research into products and services for education leaders.
- Building leadership capacity, especially within the science and engineering communities, to leverage change at the school district and state levels.
- Educating a broad constituency of practitioners about the important work of both institutions in science education.

"Freedom is the first-born daughter of science."

—Thomas Jefferson

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Message from D. Carr Thompson Chair of the NSRC Advisory Board

Who will be the future scientists of America? Will tomorrow's citizens have an adequate grasp of science for an increasingly technology- and knowledge-based world? These are important questions, given the widespread concern that the scientific and technological building blocks critical to the U.S. economy are eroding at a time when other nations are gaining strength ("Rising Above the Gathering Storm," National Academy of Sciences), and when an understanding of science is essential for effective participation in democratic institutions.

Children are natural-born scientists—but somehow their instinct to ask questions, touch objects, take things apart, and put them back together is suppressed in our schools. We must rekindle their natural instincts and reinvigorate their desire to "do" learning, particularly in science.

The National Science Resources Center continues to champion hands-on inquiry-based science learning for students. The NSRC's school reform initiatives are taking hold in several states, including Delaware, North Carolina, Oklahoma, Pennsylvania, and Washington, as well as in a number of foreign countries, including Chile, Germany, Mexico, and Sweden.

So how can the NSRC help to jump-start a revolution for change in how science is taught and learned? There is, of course, no magic bullet. Rather, we know that school reform in science education must be systemic—and it must be sustained. The NSRC uses a number of strategies. First, the staff works with education leaders and practitioners to broaden the awareness of the need for a scientifically literate workforce. Next, we help in developing comprehensive and challenging research-based programs of instruction for K–12 students that are benchmarked with other exemplary U.S. districts that have significantly improved student achievement, attitudes, and skills in science. The NSRC offers technical assistance to schools and districts—working in partnership with government, industry, the education community, and parents—to establish, sustain, and continuously improve the infrastructure needed to support high-quality science instruction for all students.

I am proud to be a part of the NSRC team. We already are seeing evidence that our school-reform strategies are being used—successfully. We encourage others groups and individuals, especially scientists, to learn about what works in primary and secondary schools and to get involved.

We all must take responsibility for educating the future scientists of America.

D. Carr Thompson
Chair, NSRC National Advisory Board

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Message from Sally Goetz Shuler Executive Director of the NSRC

Three key reports issued last year—"Rising Above the Gathering Storm" from The National Academies, "Tapping America's Potential" from the Business Roundtable, and "A Commitment to America's Future" from the Business-Higher Education Forum—reflect current serious concerns about the state of science education in the United States.

At first glance, it may seem that little has changed since publication of "A Nation at Risk," the report that led to the creation of the NSRC more than 20 years ago. But today's world is different in fundamental ways from the world of 1985. The awareness of shortcomings in science education is far broader. The rise of India and China as economic powers has altered our perception of our place in the world. The No Child Left Behind legislation has generated renewed calls for accountability in all aspects of public education, including science.

All of these factors have required us to re-examine our purpose and strategic business goals. At our annual staff retreat, we worked together to produce the revised mission and vision statements on page four of this report and helped reposition and refocus the NSRC to respond to new challenges. We reinvigorated our partnership efforts in many ways, such as helping states and regions move to scale in their efforts to provide all students with high-quality science programs.

During the past year, we have continued to work diligently to become a sustainable organization. To that end, we established endowments at both the National Academies and the Smithsonian to prepare for a more stable source of funding for our programs and operations in the future. We have continued to strengthen and expand our partnerships with Smithsonian units, states, academic institutions, corporations, foundations, and professional organizations. Our programs have been continuously improved to reflect current research and experiences working with practitioners in the field.

In all of this work, the staff has done a remarkable job in accomplishing ambitious goals and embracing change and new priorities. They are exceptional individuals, committed to excellence and dedicated to our mission and the nation's youth. We are indebted to our parent institutions—the National Academies and the Smithsonian—for their continued support, the members of the NSRC National Advisory Board for their sage and practical counsel, and our partners and sponsors for their sustained commitment to this important work.

Sally Goetz Shuler
Executive Director

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Mission—Our Primary Purpose

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

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.

Looking Back on 2005

The year 2005 marked the National Science Resources Center's 20th anniversary. This 20-year period saw the rise of new opportunities—such as the promulgation of the National Research Council's National Science Education Standards—and challenges—such as the rise of China and India as important competitors in the global marketplace.

Over the course of these two decades, the NSRC played an increasingly important role in the science education of our nation's youth. Our comprehensive program of science education—scaling up and sustaining effective science programs in schools, supporting the professional growth of teachers of science, and providing exemplary, research-based science instructional materials—has helped construct a sound platform upon which to improve science education for all children with districts and states.

The year 2005 was pivotal for the NSRC in many ways. An all-staff retreat in early October 2005 resulted in a thorough self-examination of NSRC products, services, and processes. The retreat produced the revised mission and values statements on the facing page and reinforced the organization's commitment to meeting its internal and external goals. The NSRC's business plan will help the organization maintain its focus on those goals in service of organizational sustainability, core products and services, and exemplary science programs for all students.

NSRC Internal Goals

Sustaining Institutional Capacity and Management Excellence—by continuing to attract, cultivate, and retain highly skilled and innovative staff who can develop and deliver exceptional programs and services based on research and best or promising practices by 2010.

Hired new staff for the Leadership and Assistance for Science Education Reform (LASER) and Curriculum Development Centers . . . Promoted from within to fill the position of director of Communications and Publications . . . Initiated an NSRC Internship Program . . . Rewarded staff contributions with significant awards to two high-performing employees . . .

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Increasing Financial Strength—by sustaining and expanding the work of the NSRC through the increase, diversification, and sustainability of the NSRC's funding base from $3.3 million to at least $5.5 million annually in five years.

Established quasi-endowments at the National Academies and the Smithsonian Institution to provide partial support for NSRC core operations and programs beginning in 2011 . . . Founded the NSRC Corporate and Foundation Coalition to expand and diversify the involvement of the private sector in systemic reform efforts . . . Increased output of proposals for both federal and private sources of funding . . . Continued implementation of our business plan goal to sell the 12-volume, self-published children's book series Science and Technology for Children BOOKS™, which resulted in the recovery of our research and development investment of $600,000 . . .

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Looking Back on 2005: **NSRC Internal Goals, cont'd**

Leveraging Intellectual Capacity and Impact—through listening to customers, implementing continuous development practices, expanding strategic partnerships, recommending areas where research is required, and conducting research.

Surveyed school districts that have attended NSRC Science Education Strategic Planning Institutes to document their adoption of research-based instructional materials . . . Developed new partnerships with academic institutions and states to advance our work and to launch new research projects . . .

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NSRC External Goals

Increasing Public Understanding of Science Education—with at least 500 officials in the United States by 2010.

Engaged hundreds of leaders from business, foundations, academia, and government in numerous events, including the first annual National Symposium on Science Education for Business Leaders . . . Expanded the scope of the NSRC Web presence . . .

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Scaling Up Reform in Districts and States—by engaging school districts representing an additional 20% of the U.S. K–12 student population in the process of improving their science programs based on research and best practices by 2010.

Assisted 38 school districts that enroll approximately 400,000 K–8 students in developing plans for science education reform at the National K–8 Science Education Strategic Planning Institute and the Middle School Science Education Planning Symposia . . . Engaged leaders from business, foundations, academia, and government in the first annual National Symposium on Science Education for Business Leaders as a way of leveraging their involvement in science education . . .

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Supporting Sustainability—by assisting school districts representing 20% of the U.S. K–12 student population to sustain the implementation of their science programs based on research and best practices.

Sponsored the first Smithsonian Science Education Academy for Teachers to improve the content knowledge and teaching skills of nearly 50 teachers of science . . . Hosted special events for more than 500 school district and community leaders. . .

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Looking Back on 2005: NSRC External Goals, cont'd

Building Leadership Capacity—by sustaining and expanding the leadership development program of the NSRC to prepare an additional 300 diverse leaders to contribute to science education reform by 2010.

Provided 48 school district and community leaders with professional development as faculty at national and regional NSRC institutes . . . Provided networking opportunities for NSRC partners in conjunction with the National Science Teachers Association Annual Convention . . .

* * * * *

Developing and Strengthening International Capacity—by working, as a part of the InterAcademy Panel program, with other countries to develop scientific and leadership capacity in the establishment of research-based science programs.

Worked in partnership with the InterAcademy Panel and the Royal Swedish Academy of Sciences to conduct an international conference on "Evaluation of Inquiry-Based Science Education Programmes" for representatives of 27 countries . . . Worked in partnership with Chile and Colombia to conduct strategic planning institutes for South American educators and scientists . . . Hosted visiting leadership teams from Colombia, the Philippines, and Trinidad and Tobago at strategic planning institutes in the United States . . . Made presentations on science education to African education leaders in Uganda and Senegal . . . Continued close working relationship with science reform efforts in Chile, Mexico, and Sweden . . .

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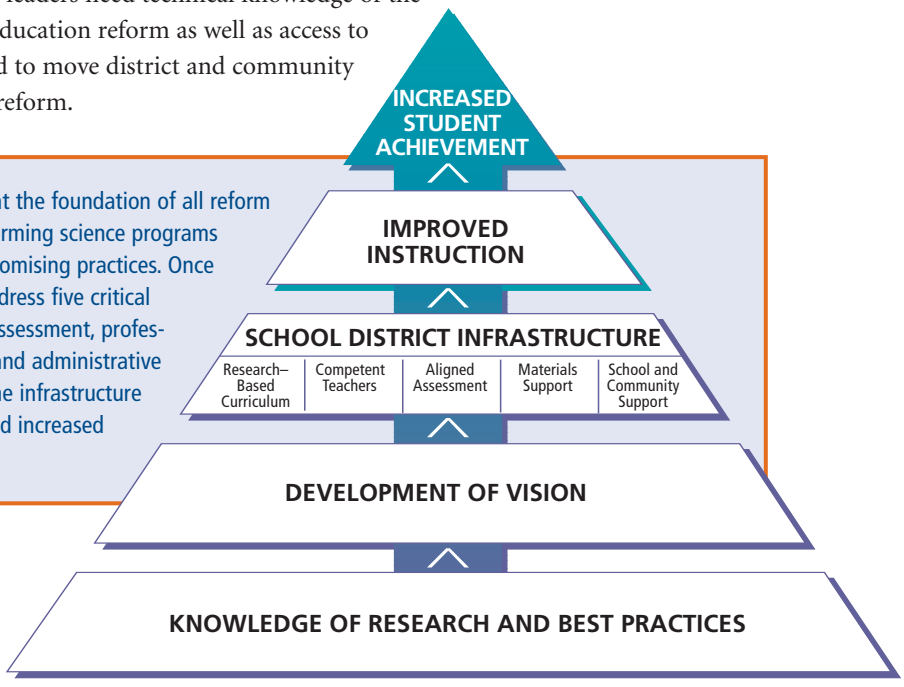
Improving Public Understanding of Science Education

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 or involving them in active reform movements. To that end, the NSRC's Leadership and Assistance for Science Education Reform (LASER) Center held a National Symposium on Science Education for Business Leaders in September 2005 to focus on ways to leverage the involvement of business and industry in the education of our nation's youth through K–12 science education reform efforts. In addition, the NSRC established a new Corporate and Foundation Coalition to accelerate the improvement of science instruction by engaging more corporations and foundations in the work of science education reform. The first two meetings of the Coalition were held in conjunction with the semi-annual NSRC National Advisory Board meetings in Washington, D.C. The NSRC has established an ambitious goal to bring together more than 40 foundations and corporations that will scale up science education in the country.

Scaling Up and Sustaining Effective Science Education Programs

The NSRC's LASER Center staff has developed processes, services, and products over the past two decades to help districts, states, and regions scale up and sustain effective science programs. These efforts require leaders to employ a theory of action, implement a systemic approach to science education, be committed to a long-term process, base their work on research and promising practices, and use evidence to evaluate their impact. As a part of the process, these leaders need technical knowledge of the five essential components of science education reform as well as access to products and services that can be used to move district and community leaders through the various stages of reform.

The NSRC's **Theory of Action** posits that the foundation of all reform and the development of a vision for reforming science programs should be research and knowledge of promising practices. Once the vision is in place, leaders need to address five critical elements simultaneously—curriculum, assessment, professional development, materials support, and administrative and community support—to establish the infrastructure that will lead to improved instruction and increased student achievement.



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Engaged New School Districts in Reform. This past year, the NSRC's LASER Center engaged 77 leadership teams in NSRC science education strategic planning institutes, including 45 teams from districts that had not previously attended an institute. Total student enrollment in these "new" school districts is nearly one percent of the U.S. public school student population. Participating teams learned about research and best practices, and they drafted five-year strategic plans for improving the science programs in their local communities. The table at left provides information on the school districts that attended an NSRC strategic planning institute for the first time, including total student enrollment in the district and the percentage of those students who are eligible for free or reduced-price lunch programs.

Initiation of Reform

EVENT	NO. OF NEW TEAMS	TOTAL K–12 STUDENT ENROLLMENT	LUNCH ELIGIBILITY
December 2004 National LASER Middle School Science Education Planning Symposium; Atlanta, GA	11	147,297	43%
June 2005 Washington State LASER K–8 Science Education Strategic Planning Institute; Everett, WA	23	48,166	31%
July 2005 National LASER K–8 Science Education Strategic Planning Institute; Washington, DC	6	45,455	45%
December 2005 National LASER Middle School Science Education Planning Symposium; St. Louis, MO	5	84,592	57%
Total	45	325,510	45%

Developed Leadership Capacity in Schools and Districts. The NSRC has provided more than 200 leaders with a minimum of 100 hours each of professional development experience related to science education reform through opportunities to serve as faculty for NSRC strategic planning institutes. In this position, they advise and mentor planning teams and become leaders in a nationwide learning network of science education professionals. In 2005, 48 leaders were afforded this unique opportunity to begin or build on their experience in this role at national and regional strategic planning institutes.

In addition, many school districts develop their internal leadership capacity by sending teams to more than one strategic planning institute. In 2005, 32 of the 77 leadership teams represented school districts or special groups that had attended previous institutes and in this way built upon and expanded the local reform effort.

Showcase of New Science Education Resources. The NSRC hosted the annual Showcase of New Science Education Resources during the National Science Teachers Association Conference in Dallas, Texas, on March 30, 2005. The event, jointly sponsored by the Merck Institute for Science Education and the National Science Resources Center, was attended by more than 170 teachers, teacher leaders, school district administrators, representatives from state departments of education, university leaders, and business and industry leaders. Participants learned about the most current resources from eight prestigious science education organizations, and received print resources representing current research on how people learn and how students learn science, plus additional cutting-edge work from the National Research Council, the operating arm of the National Academies.

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Providing Research-Based Science Instructional Materials

Research-based science instructional materials are a critical component of effective science programs. The NSRC Curriculum Development Center researches, develops, and disseminates inquiry-centered science instructional materials that school districts can use to construct core educational programs. The NSRC has spent 18 years developing and updating a comprehensive science program for children in kindergarten through grade nine (the STC Program™). The STC Program consists of the 24-unit Science and Technology for Children® (STC®) curriculum for kindergarten through grade six and the eight-module Science and Technology Concepts for Middle Schools™ (STC/MS™) curriculum for grades six through nine.

STC Program™
Elementary Science

Science and Technology for Children®

Grade Level	Life and Earth Sciences		Physical Sciences and Technology	
K–1	Organisms	Weather	Solids and Liquids	Comparing and Measuring
2–3	The Life Cycle of Butterflies	Soils	Changes	Balancing and Weighing
	Plant Growth and Development	Rocks and Minerals	Chemical Tests	Sound
4–5	Animal Studies	Land and Water	Electric Circuits	Motion and Design
	Microworlds	Ecosystems	Food Chemistry	Floating and Sinking
5–6	Experiments with Plants	Measuring Time	Magnets and Motors	The Technology of Paper

STC BOOKS™ Literacy Supplement

	Life and Earth Sciences		Physical Sciences and Technology	
3	Plant Growth and Development*	Rocks and Minerals*	Chemical Tests*	Sound*
4–5	Animal Studies	Land and Water	Electric Circuits	Motion and Design
	Microworlds	Ecosystems	Food Chemistry	Floating and Sinking
5–6	Experiments with Plants	Measuring Time	Magnets and Motors	The Technology of Paper

* Under Development

Provided a Literacy Component for Science Teachers. The 12-title Science and Technology for Children BOOKS™ provide a literacy complement to the upper elementary curriculum. The STC BOOKS™ series, originally released in 2004, are becoming widely used by teachers who are using the NSRC's elementary science program. These books are providing important informational texts not only to help children learn more about science, social studies, and history, but also to enhance their reading and comprehension skills. By the end of 2005, eight of the 12 titles in the series—*Animal Studies, Ecosystems, Electric Circuits, Floating and Sinking, Food Chemistry, Land and Water, Microworlds,* and *Motion and Design*—had been reprinted at least once. The NSRC has begun development of books to accompany its grade three science units, the next step in completing the series for kindergarten through grade nine.

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Enhanced Web-Based Resources. The NSRC is implementing a Web-based reading complement, the Electronic Literacy Supplement (ELS), to its Science and Technology Concepts for Middle Schools (STC/MS) curriculum module *Properties of Matter.* The goal of the project is to enhance student learning and interest in science by providing online reading selections and links to Web-based Smithsonian and other resources, while promoting science literacy and presenting practical, real-world application of science concepts. Planning has begun to develop ELSs for the remaining seven STC/MS titles.

Collaborated with STRI. The NSRC and the Smithsonian Tropical Research Institute (STRI) signed a memorandum of understanding that will lead to the joint development and production of a unique series of science educational products. The first product of the collaboration will be the *Smithsonian Series of Biodiversity*, a bilingual (Spanish and English) educational initiative for elementary school children in Panama, the United States, and the world. These books about key themes of biodiversity will be based on the results of the scientific research carried out in Panama by STRI researchers, and the books will be developed using the NSRC's research and development processes. This project will demonstrate how two Smithsonian science units can effectively collaborate to produce a new and exciting resource that will contribute to the goals articulated in the Institution's Science Strategic Plan.

Conducted a Survey of Science Curriculum Adopters. Georgetown University conducted a yearlong pilot study to determine which science curricula have been adopted by school districts that have participated in NSRC leadership development programs since 1989. These programs advocate the use of research-based science curriculum, including but not limited to the NSRC's STC program materials. Results are being analyzed with plans to release findings in 2006.

STC Program™
Secondary Science

Secondary Science Semester Courses

Grade Level	STC/MS Module Semester 1	STC/MS Module Semester 2	Option A
6	Organisms—From Macro to Micro	Human Body Systems	Life Sciences
7	Catastrophic Events	Earth in Space	Earth Sciences
8	Energy, Machines, and Motion	Properties of Matter	Physical Sciences and Technology
9	Electrical Energy and Circuit Design	Light	

Grade Level	STC/MS Module Semester 1	STC/MS Module Semester 2	Option B
6	Organisms—From Macro to Micro	Catastrophic Events	Life and Earth Sciences
7	Human Body Systems	Earth in Space	
8	Properties of Matter	Energy, Machines, and Motion	Physical Sciences and Technology
9	Light	Electrical Energy and Circuit Design	

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Supporting the Professional Growth of Teachers of Science

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.

Developed the First Smithsonian Science Education Academy for Teachers. The NSRC's Professional Development (PD) Center held the first Smithsonian Science Education Academy for Teachers in July 2005 involving 50 teachers and trainers, representing 14 states and two foreign countries, Canada and South Korea. The participants were engaged in inquiry-based science lessons based on the NSRC middle school curriculum and "behind-the-scenes" interactions with Smithsonian Institution scientists, curators, and collections. This successful program will continue in 2006.

Reached Out to D.C.-Area School Principals. The NSRC's PD Center conducted a presentation to approximately 52 Washington, D.C., school principals on inquiry science and the nature of the Smithsonian NSRC curriculum modules. This presentation provided an opportunity for the school principals to learn more about inquiry-based science programs and the skills needed to create a supportive classroom environment for student inquiry.

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Supported In-Service Teacher Programs. The NSRC's PD Center began a program of support of two University Centers for Science Teaching and Learning at Rider and Montclair State Universities in New Jersey. Both centers are funded by the Bristol-Myers Squibb (BMS) Foundation. The PD Center will continue to provide teacher support and training workshops for the BMS centers in 2006. In addition, the PD Center conducted workshops for middle school teachers and teacher-leaders at the Oklahoma State University Center for Science Literacy.

Provided Training for Summer Program Instructors. The NSRC provided training to 22 summer instructors for Washington, D.C., children in grades 2–5, through a grant provided by the DC Children and Youth Investment Trust Corporation. Participants estimated that about 25 students attended from each of seven organizations. This program will continue in 2006.

Prepared Graduate-Level Content Courses for Science Teachers. With support from a National Academies' W.K. Kellogg Endowment Fund grant, the PD Center worked in partnership with teams of scientists to prepare eight graduate-level science content courses based on the STC/MS curriculum. Drafts of those courses are now complete. The NSRC has formed partnerships with 15 academic institutions that have committed to field-testing the course with middle school teachers in their regions.

Coordinated Training for Middle School Science Teachers. The NSRC provided the trainers and curriculum materials for three, seven-day professional development experiences for the first round of a mathematics, science, and technology initiative for Alabama teachers in June and July 2005. More than 100 Alabama middle school teachers received training in one of three STC/MS modules: *Human Body Systems, Organisms—From Macro to Micro,* or *Earth in Space.*

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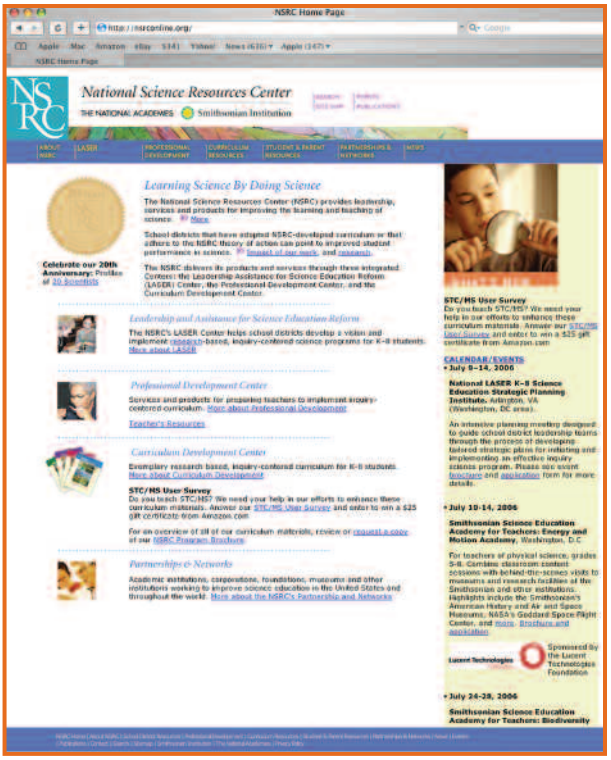
Improving Access to Science Education Resources through Communications and Publications

The NSRC's Communications and Publications Division helps provide the public face of the NSRC. This division supports all other units of the NSRC by maintaining the organizational Web site; disseminating information on events; developing, producing, and disseminating publications about the products, services, and programs offered by the NSRC; representing the organization at Smithsonian-sponsored events for teachers; and coordinating the exhibit at the annual National Science Teachers Association annual conference on science education. The division also maintains the integrity of the design elements associated with the NSRC "brand."



Improved Web Resources. The NSRC Web site, ***www.nsrconline.org***, highlights research and science education resources for school districts, teachers, students, parents, corporations, and foundations. The site provides details on the impact of the NSRC's work and links to the Smithsonian Institution and the National Academies, as well as other museums, science centers, and other organizations with quality resources.

To mark its 20th anniversary, the NSRC significantly modified Web content including the addition of profiles of 20 scientists who have helped shape our world, 30 links for student resources, and 66 links for parents, all showcasing Smithsonian resources. During FY 2005, visits to the Web site increased significantly; 85 percent of the hits were from visitors in the United States and 15 percent were from abroad. The NSRC also established additional Web sites in support of the Smithsonian Science Education Academies for Teachers (***www.science-teachers-academies.si.edu***) and the *Properties of Matter* Electronic Learning Supplement, which will go live during 2006.

Supported NSRC Programs. The Communication and Publications Division coordinates a campaign approach to the promotion of NSRC events. This approach involves working with other units of the NSRC in the identification of target audiences, development of mail and electronic mailing lists, and the preparation, production, and dissemination of materials in print and electronic formats. During 2005, the division supported:

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- Several NSRC events at the National Science Teachers Association national science education convention in Dallas, Texas
- The LASER Center's National Science Education Strategic Planning Institute in July, the new National Symposium on Science Education for Business Leaders in September, and the Middle School Science Education Planning Symposium in December (see page 8)
- The Professional Development Center's inaugural Smithsonian Science Education Academy for Teachers in July (see page 12)

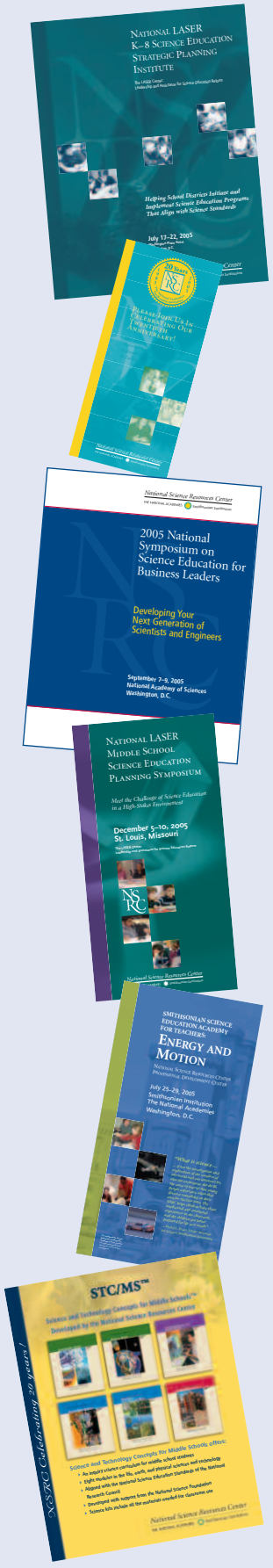
Developed and Disseminated Publications. In addition to materials in support of specific NSRC events, the division coordinated the production and publication of all NSRC materials for public release. These materials included:

- The revision and reprinting of eight of the 12 titles in the Science and Technology for Children BOOKS™ series (see page 10)
- The revision and reprinting of "2005–06 NSRC Inquiry-Based Science Education Programs" brochure, a catalog of the NSRC's programs, products, and services
- The development and production of a brochure on the Science and Technology Concepts for Middle Schools™ (STC/MS) curriculum
- The development and production of the 2004 NSRC *Annual Report*

Reached Out to Teachers. The NSRC joined the Smithsonian Center on Education and Museum Studies and other Smithsonian museums and educational organizations at the annual Smithsonian Teachers Night expo in Washington. This yearly event provides teachers a great opportunity to learn more about how to incorporate Smithsonian resources into their classroom. The NSRC disseminated 300 packets of information on our products and services and collected contact information on 259 teachers mainly from the Washington, D.C., metropolitan area. This initiative will further improve the goals and mission of both the NSRC and the Smithsonian to impact outside sources for outreach.

In collaboration with the Smithsonian Center for Education and Museum Studies, the NSRC presented to a special audience of board-certified teachers at a meeting of the National Board for Professional Teaching Standards. The NSRC presentation, "Translating Research and Best Practices into Quality K–8 Science Programs," provided insight on how two prestigious scientific institutions, the Smithsonian Institution and the National Academies, are working together through the NSRC to advance science learning and teaching in school districts throughout the United States and around the world. The NSRC also disseminated packets of information to conference attendees during the exhibit portion of the conference.

The NSRC also collaborated with other Smithsonian units on a day-long Science Day program of interactive presentations in conjunction with the National Science Teachers Association national convention in Dallas, Texas. This well-attended event provided convention attendees with insights into science resources throughout the Smithsonian.



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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 network of 90 national science academies that play an important role in the global effort to reform science education. 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
- Identify strategies for international cooperation in this endeavor

Helped Expand International Awareness and Extend the Reach of Research-Based Science Programs. In support of the IAP worldwide science education evaluation initiatives and inquiry-based science curriculum programs, the NSRC conducted presentations in Senegal (February 2005) and Uganda (October 2005) to help foster the adoption of inquiry science in Africa. In addition, the NSRC participated in IAP conferences in Stockholm, Sweden, in September 2005, and Edmonton, Alberta, Canada, in October 2005. In Sweden, the NSRC Executive Director was part of the U.S. delegation that worked in partnership with the InterAcademy Panel and the Royal Swedish Academy of Sciences to conduct an international conference on "Evaluation of Inquiry-Based Science Education Programmes" for representatives of 27 countries.

Developed International Capacity for Reform. NSRC leadership worked in partnership with Chile and Colombia to conduct strategic planning institutes in those countries. In October 2004, eight leadership teams and three special guests (40 participants altogether) attended a strategic planning institute in Santiago, Chile. Teams represented Argentina, Brazil, Chile, Colombia, and Venezuela, with special guests representing Bolivia, Canada, and Mexico. A second international strategic planning institute was held in Bogotá, Colombia, in May 2005. This institute included 20 leaders representing the Colombia Academy of Sciences, the

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Colombia Ministry of Education, professors from the University of Los Andes, and project leaders from not only Colombia but also Argentina, Ecuador, Peru, and El Salvador. Participants were in different stages of reforming their science education programs and learned critical strategies about how to initiate, implement, and scale up their efforts.

During 2005, the NSRC hosted visiting leadership teams from Colombia, the Philippines, and Trinidad and Tobago at strategic planning institutes in the United States. These teams drafted strategic plans for improving science education in their home countries.

In addition, an educator from Chile served as a faculty member at the July 2005 National Strategic Planning Institute, further developing her leadership capacity for reform in Chile. Educators from Canada and South Korea sharpened their physical science knowledge at the 2005 Smithsonian Science Education Academy for Teachers.

Continued Support of Ongoing Science Programs in Other Countries. The NSRC continues to work in partnership with the Chilean Ministry of Education, the United States-Mexico Foundation for Science, and the Royal Swedish Academy of Sciences. All three countries have initiated projects to translate the NSRC curriculum and implement the NSRC reform model.

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Sustaining Our Financial Health

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 over time. NSRC gifts, grants, fee-for-service revenues, curriculum royalties and publication sales activities plus contributions from the Smithsonian and the National Academies—and the NSRC's commitment to the careful stewardship of all its resources—are aimed at creating and sustaining a stable funding base.

Looking Back

During the past two decades, the investments by the Smithsonian and the National Academies have been critical to advancing program efforts and support. For each dollar invested by its parent institutions, the NSRC has been able to raise an average of four dollars or more to support the program efforts required to achieve the goals and mission of the organization.

With support from numerous federal agencies, private foundations, and corporations, the NSRC has secured more than $40 million of support to advance science education in the country and around the world. Our financial health during this period has required the staff to build enduring partnerships and be innovative, entrepreneurial, and flexible during changing economic times.

Planning for Our Future

National Academies' Quasi-Endowment. In October 2004, the NSRC invested $3.4 million of its existing royalties to establish a quasi-endowment at the National Academies. For seven years, the NSRC plans to make an annual deposit of $500,000 with the goal of having more than $10 million in this fund by 2011. At that time, the NSRC plans to begin withdrawing 5 percent of the balance annually to provide partial support for NSRC core operations and development activities.

	Year	Deposits	Interest Earned	Ending Balance
	2004	$3,395,238	$383,843	$3,779,081
	2005	$584,106	$444,294	$4,807,481
Projections	2006	$500,000	$424,598	$5,732,079
Projections	2007	$500,000	$498,566	$6,730,646
Projections	2008	$500,000	$578,452	$7,809,098
Projections	2009	$500,000	$664,728	$8,973,825
Projections	2010	$500,000	$757,906	$10,231,731
Projections	2011	$500,000	$817,612	*$11,037,756

* Reflects withdrawal of $511,587 for partial support of core operations and development activities.

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Fiscal Year 2005 Operations

NSRC Administrative Oversight and Financial Operations. In FY 2005, the NSRC received $781,000 from the Smithsonian and the National Academies to provide staff and related expenses needed for administrative oversight and financial operations. Of the four sources of funding received, the Smithsonian provided resources from two: Smithsonian General Trust—$305,000; and Smithsonian Trust Indirect—$66,000 from general and administrative rates charged against grants received. In addition to the Smithsonian sources, the National Academies supported the NSRC with $410,000 from two sources: National Academies Indirect Fund—$80,000; and NSRC royalty funds at the National Academies—$330,000, which transferred to the Smithsonian as a part of a formal approval process.

NSRC Communications and Publications Division. This past year the NSRC Communications and Publications Division received $437,000 from two funding sources to support staff and related expenses. The Smithsonian provided $141,000 from the federal budget for core operations of this division. However, at the end of FY 2005, the NSRC was required to eliminate its Smithsonian federal source of funding. In the future, the NSRC will have to support these costs from other revenue sources. The NSRC also used $296,000 of its curriculum royalties for this division. These funds were transferred from the National Academies to the Smithsonian as a part of the overall budget approval process by the NSRC Executive Committee.

For FY 2006, this division will be using a new source of funding to provide partial support for its operations and program work with the three NSRC Centers of Excellence. This source will be the net profits derived from the sale of the NSRC Science and Technology for Children BOOKS™ for grades four through six. The NSRC published this series of 12 books in 2004.

NSRC Development Division. During its first 17 years, the NSRC did not have a development division. All development responsibilities were undertaken by the NSRC Deputy Director, who did not have a budget or staff for this purpose. Beginning in 2003, the NSRC restructured this work to create this division. One staff member was promoted to NSRC Development Associate, and several consultants were hired who worked to build development capacity with the NSRC senior staff and to expand and diversify activities. For FY 2005, a total of $110,000 of support from the NSRC's royalty funds were used to support this new work. In FY 2006, plans are underway to hire a Director of Development to continue to strengthen and expand our accomplishments and achieve our strategic business goals for the next five years.

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NSRC's Three Centers of Excellence. During FY 2005, the NSRC received a total of $1,564,000 in support of program activities. Support was obtained from four sources:

- Grants awarded by federal and state agencies
- Gifts and private grants
- National Academies' royalty funds
- Fees from school districts and teachers for professional development services

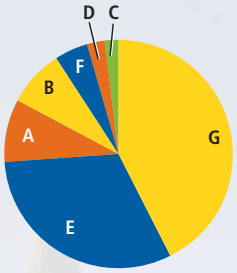
NSRC Leadership and Assistance for Science Education Reform Center. The LASER Center received total financial support of $881,335 during FY 2005 from three sources of funding: federal grants—$526,000, which included a grant from the National Science Foundation; gifts and private grants—$270,000, including $175,000 from the Bristol-Myers Squibb Foundation, $20,000 from the Shell Exploration and Production Company, $25,000 from the Merck Institute for Science Education, and $50,000 from Hewlett-Packard; and school district registration fees for NSRC events—$85,335.

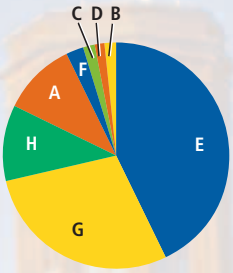
NSRC Curriculum Development Center. During FY 2005, the Curriculum Development Center received a total of $115,000 from two sources: NSRC royalties of $65,000 and a National Academies' Kellogg Grant of $50,000 to produce children's books for grades one through three.

NSRC Professional Development Center. The Professional Development Center received a total of $402,440 of financial support during FY 2005 from three funding sources: gifts and grants—$224,440, including $180,000 from the Lucent Technologies Foundation, $1,000 from the Smithsonian Lemelson Fund, and $43,440 as a Smithsonian Innovation grant; NSRC royalty funds—$100,000; and event fees—$78,000.

International Division. In FY 2005, the NSRC initiated an International Division to develop scientific and leadership capacity for research-based science programs. As a part of this effort, the NSRC received a $20,000 gift from Bruce Alberts, President Emeritus of the National Academy of Sciences, to support an InterAcademy Panel conference at the Royal Swedish Academy of Sciences in Stockholm in partnership with the NSRC.

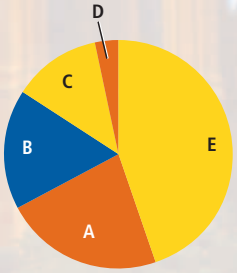
Sources of Funding

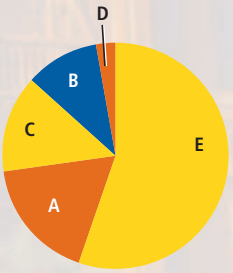




	Actual, FY 2005		Projected, FY 2006	
A. Smithsonian General Trust	$305,000	9%	$552,000	10%
B. Smithsonian Federal	$287,000	8%	$78,000	1%
C. Smithsonian Indirect	$66,000	2%	$87,000	2%
D. National Academies Indirect	$80,000	2%	$80,000	2%
E. Gifts and Grants	$1,090,000	31%	$2,276,000	43%
F. Event Fees	$163,000	5%	$136,000	3%
G. Royalties	$1,485,000	43%	$1,509,000	28%
H. Sale of Publications	$0	0%	$575,000	11%
TOTAL	**$3,476,000**	**100%**	**$5,293,000**	**100%**

Allocation of Resources





	Actual, FY 2005		Projected, FY 2006	
A. Administrative Oversight and Financial Operations	$781,000	22%	$916,000	17%
B. Savings Deposit	$584,000	17%	$557,000	11%
C. Communications & Publications	$437,000	13%	$736,000	14%
D. Development	$110,000	3%	$146,000	3%
E. Programs	$1,564,000	45%	$2,938,000	55%
TOTAL	**$3,476,000**	**100%**	**$5,293,000**	**100%**

NSRC Core Operations

NSRC SAVINGS: ENDOWMENT DEPOSITS

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
Deposits for Smithsonian Institution Endowment	N/A	N/A	N/A	N/A	N/A	N/A	57
National Academies							
Royalty Fund Deposit for NAS Endowment	N/A	N/A	N/A	N/A	3,395	584	500
Subtotal	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 3,395**	**$ 584**	**$ 557**

ADMINISTRATIVE OVERSIGHT & FINANCIAL OPERATIONS

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
General Trust (1)	274	290	287	279	292	305	318
Indirect Cost Budget (2)	311	320	403	410	466	66	87
National Academies							
Indirect	93	103	77	81	80	80	80
Royalty Fund	N/A	36	120	20	68	330	431
Subtotal	**$ 678**	**$ 749**	**$ 887**	**$ 790**	**$ 906**	**$ 781**	**$ 916**

COMMUNICATIONS & PUBLICATIONS DIVISION

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
Federal	230	153	161	167	171	141	78
General Trust	N/A	N/A	N/A	N/A	N/A	N/A	83
Indirect	138	146	63	59	N/A	N/A	N/A
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A
National Academies							
Royalty Fund	N/A	N/A	43	162	342	296	N/A
Sale of Publications	N/A	N/A	N/A	N/A	N/A	N/A	575
SCIENCE & TECHNOLOGY FOR CHILDREN® CURRICULUM REVISIONS							
National Academies							
Royalty Fund	N/A	N/A	N/A	193	110	N/A	N/A
SCIENCE & TECHNOLOGY CONCEPTS FOR MIDDLE SCHOOL™ CURRICULUM DEVELOPMENT PROJECT							
Smithsonian Institution							
Federal & State Grants	83	99	187	N/A	N/A	N/A	N/A
SCIENCE & TECHNOLOGY FOR CHILDREN BOOKS™ DEVELOPMENT PROJECT							
Smithsonian Institution							
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A	N/A
National Academies							
Kellogg Grant	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Royalty Fund	N/A	N/A	N/A	500	N/A	N/A	N/A
Subtotal	**$ 451**	**$ 398**	**$ 454**	**$ 1,081**	**$ 623**	**$ 437**	**$ 736**

DEVELOPMENT DIVISION

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
National Academies							
Royalty Fund	N/A	N/A	N/A	99	105	110	146
Subtotal	**$ 0**	**$ 0**	**$ 0**	**$ 99**	**$ 105**	**$ 110**	**$ 146**
TOTAL SUPPORT	**$ 1,129**	**$ 1,147**	**$ 1,341**	**$ 1,970**	**$ 5,029**	**$ 1,912**	**$ 2,355**

(1) During FY 2000–FY 2002, the NSRC Deputy Director was responsible for development with no staff or budget.
(2) These funds were derived from general and administrative rates charged against National Science Foundation grants that will be completed in FY 2006.

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NSRC Three Centers of Excellence

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PROGRAM OVERSIGHT & MANAGEMENT

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
Federal	N/A	N/A	N/A	N/A	N/A	146	N/A
General Trust	N/A	N/A	N/A	N/A	N/A	N/A	151
Subtotal	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**$ 146**	**$ 151**

NSRC LEADERSHIP AND ASSISTANCE FOR SCIENCE EDUCATION REFORM (LASER) CENTER

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
Federal & State Grants	1,213	1,267	1,318	628	774	526	568
Gifts & Non-Federal & State Grants	636	748	615	647	331	270	1,525[3]
Event Fees	513	369	293	145	61	85	71
National Academies							
National Research Council Grant	N/A	35	N/A	N/A	N/A	N/A	N/A
Royalty Fund	105	221	177	N/A	N/A	N/A	N/A
Subtotal	**$ 2,467**	**$ 2,640**	**$ 2,403**	**$ 1,420**	**$ 1,166**	**$ 881**	**$ 2,164**

NSRC CURRICULUM DEVELOPMENT CENTER

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
SCIENCE & TECHNOLOGY FOR CHILDREN® CURRICULUM REVISIONS							
National Academies							
Royalty Fund	N/A	N/A	N/A	376	199	N/A	N/A
SCIENCE & TECHNOLOGY FOR CHILDREN BOOKS™ DEVELOPMENT PROJECT							
Smithsonian Institution							
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	N/A	30	N/A	N/A
National Academies							
Kellogg Grant	N/A	N/A	N/A	N/A	N/A	50	N/A
Royalty Fund	N/A	N/A	N/A	N/A	360	65	111
SCIENCE & TECHNOLOGY CONCEPTS FOR MIDDLE SCHOOL™ CURRICULUM DEVELOPMENT PROJECT							
Smithsonian Institution							
Federal & State Grants	829	857	133	N/A	N/A	N/A	N/A
Gifts & Non-Federal & State Grants	375	501	295	N/A	N/A	N/A	N/A
SCIENCE & TECHNOLOGY CONCEPTS FOR MIDDLE SCHOOL™ CURRICULUM REVISIONS PROJECT							
National Academies							
Royalty Fund	N/A	N/A	N/A	N/A	N/A	N/A	100[4]
Subtotal	**$ 1,204**	**$ 1,358**	**$ 428**	**$ 376**	**$ 589**	**$ 115**	**$ 211**

NSRC PROFESSIONAL DEVELOPMENT CENTER

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution							
Federal & State Grants	N/A	N/A	N/A	N/A	N/A	N/A	14
Gifts & Non-Federal & State Grants	N/A	N/A	N/A	25	80	224	169
Event Fees	N/A	N/A	N/A	5	45	78	65
National Academies							
Kellogg Endowment Fund	N/A	N/A	N/A	149	N/A	N/A	N/A
Royalty Fund	N/A	N/A	N/A	300	200	100	N/A
Subtotal	**$ 0**	**$ 0**	**$ 0**	**$ 479**	**$ 325**	**$ 402**	**$ 248**

NSRC INTERNATIONAL DIVISION

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
Smithsonian Institution	N/A	N/A	N/A	N/A	N/A	N/A	N/A
National Academies	N/A	N/A	N/A	N/A	N/A	20	64
Subtotal	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 20**	**$ 64**

RESEARCH & EVALUATION

All amounts in $000s	FY00 (Actual)	FY01 (Actual)	FY02 (Actual)	FY03 (Actual)	FY04 (Actual)	FY05 (Actual)	FY06 (Projected)
National Academies							
Royalty Fund	N/A	N/A	N/A	N/A	N/A	N/A	100
Subtotal	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 0**	**$ 100**

TOTAL PROGRAM SUPPORT	**$ 3,671**	**$ 3,998**	**$ 2,831**	**$ 2,275**	**$ 2,080**	**$ 1,564**	**$ 2,938**
OVERALL TOTAL	**$ 4,800**	**$ 5,145**	**$ 4,172**	**$ 4,245**	**$ 7,109**	**$ 3,476**	**$ 5,293**

(3) *Includes $1 million from the Burroughs Wellcome Fund. Funds will be received in FY 2006 and used by the LASER Center to support a ten-year K-12 science education reform initiative in North Carolina beginning in 2007.*

(4) *Represents one-third of salaries for the Professional Development Center Co-Directors to begin the process of revising the NSRC middle school curriculum (STC/MS).*

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*Board member's term ended during the period January 2005 through December 2005.

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John Wright
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Program Consultant for Physical Sciences

Ian MacGregor
Program Consultant for Earth and Space Sciences

INTERNATIONAL DIVISION

Smith Holt
Senior Scientist

Caitlin Kaufmann
Intern

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TWO DECADES OF PARTNERSHIPS

The challenge of reforming science education requires dedicated leadership and a long-term commitment to quality science education on the part of our staff, our parent institutions, our Board, and numerous federal agencies, private foundations, corporations, and other non-profit organizations. We thank those who have contributed to the NSRC's efforts over the past twenty years.

Federal Agencies

National Science Foundation
U.S. Department of Defense
U.S. Department of Education

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- Smithsonian Innovation Award
- Smithsonian Latino Initiatives
- Smithsonian Women's Committee

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* Leadership and Assistance for Science Education Reform (LASER)

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Highline School District, WA
Lesley University, Cambridge, MA
Mesa Public Schools, AZ
Montclair State University, Montclair, NJ
Multnomah County Public School Schools, OR
National Science Teachers Association
National Youth Science Foundation
Northeastern University, Boston, MA
Oklahoma State University, Stillwater, OK
Rider University, Lawrenceville, NJ
Schaumberg School District #54, IL

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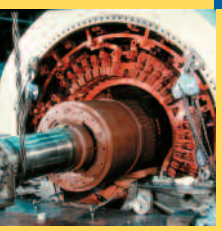

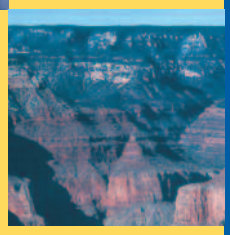

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