



“High-quality, content-driven professional development has a significant effect on student performance.”

—*Rising Above the Gathering Storm*
The National Academies, 2005

“Students learn best from teachers who have strong content knowledge and pedagogical skills.”

—National Research Council, 2002

Comments from Participants at Smithsonian Science Education Academies for Teachers

“The Energy and Motion science academy was an awesome professional development and social experience for me. I was truly impressed with the variety of experiences and presentations.”

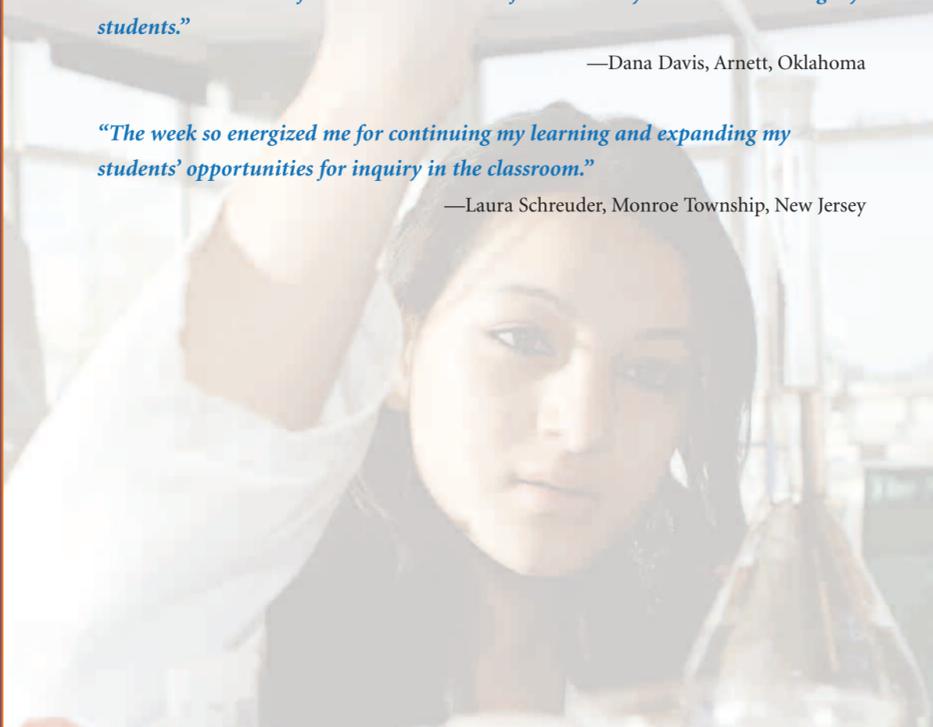
—Shirley Allan, West Windsor Township, Plainsboro, New Jersey

“A 10+. I have never been so excited about teaching after leaving another PD! I learned so much and feel so much more comfortable in my classroom teaching my students.”

—Dana Davis, Arnett, Oklahoma

“The week so energized me for continuing my learning and expanding my students’ opportunities for inquiry in the classroom.”

—Laura Schreuder, Monroe Township, New Jersey



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 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 developing professional development programs and resources that bridge research and practice for leaders in districts, academia, business, and science.
- ▶ 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.

Contact the Professional Development Center:

National Science Resources Center
Professional Development Center
901 D Street, SW, Suite 704-B
Washington, DC 20024
202.633.2970
nsrcpdcenter@si.edu

The NSRC’s Web site, www.nsrconline.org, maintains current information about the Professional Development Center’s program offerings as well as information about the NSRC’s other products and services.

THE NSRC IS AN ORGANIZATION OF:



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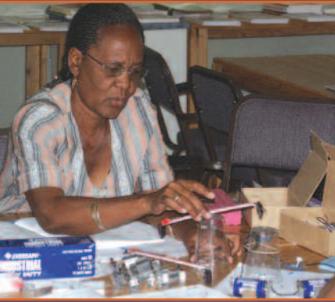
THE NATIONAL ACADEMIES  Smithsonian Institution

IMPROVING THE QUALITY OF SCIENCE INSTRUCTION



Professional Development Center:
Supporting the professional growth of teachers of science





Supporting the Professional Growth of Teachers of Science

As teachers' understanding of science content and pedagogy increases, they become more able to engage young minds in the sciences. A focused program of professional development helps teachers not only understand science better but also teach it more effectively. The National Science Resources Center's Professional Development Center offers courses, academies, and tailored workshops to help:

- ▶ **Teachers** become experts in delivering inquiry science courses, with a special emphasis on NSRC-developed curriculum
- ▶ **Teacher-leaders** become proficient in guiding other education professionals in teaching courses developed by the NSRC
- ▶ **Science specialists** implement comprehensive, engaging science programs
- ▶ **Education leaders** make thoughtful and informed science curriculum adoption decisions

Through the Center's work, teachers and professional development providers will gain a conceptual understanding of the science content and pedagogical knowledge needed to teach science effectively. Teachers at all levels of experience will learn how to assess what they know, how to confront their preconceptions about science, how to become lifelong learners, and how to solve problems based on evidence.

The Professional Development Center offers a wide variety of experiences that help teachers progress through a continuum of expertise, from beginner to expert. A professional development program that includes the content and pedagogy of science will help most teachers advance through this continuum.

Beginner → Intermediate → Proficient → Expert

Research indicates that 80 hours of professional development is a key milestone in the progression of teachers from beginners to experts in the classroom.

Partnerships for Science Education

The NSRC works with other educators to form science learning communities that link the Professional Development Center with established centers for science education. Among the Professional Development Center's partners are Smithsonian museums and National Zoo and the Bristol-Myers Squibb-sponsored Centers for Science Teaching and Learning at Rider University (Lawrenceville, New Jersey) and Montclair State University (Montclair, New Jersey). The Professional Development Center works through these centers to deliver courses for science teachers.



Supporting Your Professional Development Event

The Professional Development Center welcomes the opportunity to develop working relationships with your math-science partnership, school district, professional association, or corporate professional development initiative, and to customize its services to the unique needs of school districts and educational coalitions. You identify the specific needs of your teachers, your school, or your district. You choose the location for the training. The NSRC will arrange combinations of courses or develop programs that fit into your professional development event.

NSRC Professional Development Courses

Most professional development courses offered through the NSRC focus on the NSRC's research-based, inquiry-centered science curricula: Science and Technology for Children® (STC) for students through grade six, and Science and Technology Concepts for Middle Schools™ (STC/MS) for students in grades six through nine. A summary of courses offered by the NSRC's Professional Development Center is provided in the table below.

NSRC Professional Development Program: Courses for Advancing Teacher Quality in Science

Course	Audience	Description
Level 1 Introductory		
STC & STC/MS Curriculum Showcase (5 Hours)	Administrators, science content specialists, and teachers new to STC & STC/MS	<ul style="list-style-type: none"> • Introduction: "Why Use Inquiry" • An overview of the philosophy and goals of the STC and STC/MS program • Hands-on experience with typical investigations used in STC units and STC/MS modules • Evidence of effectiveness of STC and STC/MS
Implementation Courses for STC (6 hours)	Teachers (grades 1–6) new to STC	Prepare teachers unfamiliar with STC to implement an STC unit in their classrooms. Each course is specific to one unit and guides teachers through all lessons. (Can be extended to 12 hours to include more science content.)
Implementation Courses for STC/MS (3 days/18 hours)	Teachers (grades 6–9) new to STC/MS	Prepare teachers unfamiliar with STC/MS to implement an STC/MS unit in their classrooms. Each course is specific to one unit and guides teachers through all lessons. (Can be extended to 12 hours to include more science content.)
Level 2 Intermediate		
Level 2 Implementation Courses for STC/MS (3 days/18 hours)	Teachers with at least 1 year teaching experience with the STC/MS module	Focus on content and pedagogy instruction for current users of STC/MS modules
Short courses that support the inquiry approach to learning and teaching science	Teachers and teacher-leaders who are engaged in organizing or teaching inquiry-based science curricula	One-day courses that focus on specific areas of science education, such as: <ul style="list-style-type: none"> • Following conceptual strands in a K–9 science curriculum—STC and STC/MS; • Showcasing STC and STC/MS curriculum materials; • Using notebooks in inquiry science; • Using probeware in grades six through nine science classrooms; and • Understanding the nature of inquiry science.
Level 3 Advanced		
STC/MS 3-Day Curriculum Implementation Courses—Train the Trainers	Teachers and teacher-leaders with good presentation skills and over 2 years experience with teaching an STC/MS module	Prepare education professionals to deliver the implementation courses or train them as NSRC-certified consultants



The STC Program: K–through–9 Science Curriculum

The NSRC has developed two comprehensive science curriculum programs:

- ▶ Science and Technology for Children® (STC), a 24-unit curriculum for students from kindergarten through grade six
- ▶ Science and Technology Concepts for Middle Schools™ (STC/MS), an eight-module curriculum for students in grades six through nine

Both programs address content and pedagogy appropriate for the young learner. They engage children in inquiry-based learning. They stimulate curiosity. And they foster a sense of responsibility in children for their own learning.



Professional Development Center courses are:

- ▶ Presented by NSRC Professional Development Center-certified trainers
- ▶ Based on research and best practices in science education and teacher professional development
- ▶ Conducted at a venue in your school district or offered nationally
- ▶ Designed for groups of as many as 50 educators

Educators learn:

- ▶ The science content and pedagogy needed to implement inquiry science curriculum effectively
- ▶ Effective implementation of STC and STC/MS with their students
- ▶ Classroom management for the kits of materials and equipment

Teachers will:

- ▶ Gain an understanding of the nature of scientific inquiry and its central role in science
- ▶ Use the skills and processes of scientific inquiry
- ▶ Gain an understanding of the fundamental concepts that underlie the major science disciplines
- ▶ Become adept at identifying and clarifying student misconceptions
- ▶ Make conceptual connections within and across science disciplines, as well as with mathematics, technology, and other content areas

Smithsonian Science Education Academies for Teachers

Each summer, in the Washington, D.C., area, the Professional Development Center conducts residential academies for grades five-through-twelve science teachers. Each academy provides participating teachers with a unique experience based on selected concepts in life science, earth science, or physical science supported by the unparalleled resources of the Smithsonian Institution's museums and research facilities.

At the academies, teachers will:

- ▶ Earn college credit and/or a certificate of participation for professional development hours;
- ▶ Experience and learn pedagogical approaches that facilitate hands-on, inquiry science teaching;
- ▶ Develop a broader and deeper understanding of science concepts in the National Science Education Standards for grades five through twelve;
- ▶ Improve their understanding of the work of Smithsonian scientists and curators through exciting tours and unique behind-the-scenes experiences at the world's largest and best-known museum complex and other local venues—experiences that will be available only to a select few teachers; and
- ▶ Form a learning community with fellow science teachers and Smithsonian staff through dialogue and shared experiences that extend beyond the Academy.

Want to find out more about the NSRC's professional development program? Visit www.nsrconline.org for information about course availability and fee structure.