



“STC units have helped me to completely change the way I teach science. They promote not only a hands-on, but also a minds-on approach to science. They have helped my students to learn to become better thinkers and problem solvers. I cannot imagine going back to a textbook approach to teaching science.”

—Sue Gunter, Teacher in Residence, Hands-on Activity Science Program (HASP),
University of Alabama in Huntsville, Alabama

“As a new teacher, without an extensive science background, I found the STC/MS program to be very easy to use. . . . The activities are thought provoking, yet easy to set up and manage. The lessons provide opportunities for constant assessment, which gives the teacher better understanding of how the students are progressing.”

—Ana Morris, Grade 8 Teacher, Sacajawea Middle School, Montana

“Scope and sequence are STC’s strengths. The program engages children in inquiry-based process skills and science concepts. STC has a really nice flow.”

—Ann Bower, Elementary Science Professional Development Coordinator, Capital Regional Board of Cooperative Education Services, Schenectady City School District, New York

“We liked the quality of the STC kits and the design of the instruction that comes with them. . . . The teacher’s guide is logically arranged, so teachers can go through the unit in sequence. The guide makes it pretty easy for teachers—even if they’re a little uncertain about science activities.”

—Eugene Hungate, Assistant Director, Curriculum and Instruction,
Elkhart Community Schools, Indiana

“We like the way units fit from one level to another—for example, the way Electric Circuits builds and then Magnets and Motors follows from that. . . . They blend so well and build on each other.”

—Henrietta Payne, Teacher, Westside Community School District, Omaha, Nebraska



The 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 Curriculum Development Center:

National Science Resources Center
Curriculum Development Center
901 D Street, SW, Suite 704-B
Washington, DC 20024
202.633.3005
NSRC_curriculum@si.edu

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

National Science Resources Center

THE NATIONAL ACADEMIES  Smithsonian Institution

PROVIDING RESEARCH-BASED INSTRUCTIONAL MATERIALS



Curriculum Development Center: Developing and disseminating innovative, research-based curriculum for improving science learning and teaching



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Making an Impact on Student Achievement:

An emerging body of research indicates that when quality instructional materials are fully implemented—that is, taught consistently, using all components—the result is enhanced student achievement, compared with the use of traditional curricula.

Gaston, G.; Wood, R.; Collette, J. Delaware Smithsonian Project Report: Building on Success to Improve Our Children's Future

Klentschy, M.; Garrison, L.; & Amaral, O.M. Valle Imperial Project in Science (VIPs): Four-Year Comparison of Achievement Data.

Research-based curriculum is an essential component of an effective science program. The NSRC's Curriculum Development Center develops research-based, inquiry-centered science education curricula that school districts can use to construct core instructional programs.

Research-Based Inquiry Science Instructional Materials

The NSRC has developed a comprehensive science curriculum program, the STC Program™, in two parts:

- ▶ Science and Technology for Children® (STC®), a 24-unit curriculum for students from kindergarten through grade 6
- ▶ Science and Technology Concepts for Middle Schools™ (STC/MS™), an eight-module curriculum for students in grades 6 through 9

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.

NSRC curricula are based on research which shows that children learn science best through concrete experiences. Educational activities should relate directly to children's understanding of the world, with youngsters investigating scientific phenomena firsthand. STC units provide students with opportunities to learn age-appropriate concepts and skills and to acquire scientific attitudes and habits of mind. Students work independently and cooperatively to do investigations; ask questions; make and test predictions; record, reflect on, and share their findings; and apply their new skills and knowledge.

The development of each unit involves extensive consultations with teachers, scientists, and evaluators. Prior to release, the NSRC field-tests its curriculum in urban, suburban, and rural classrooms nationwide and assembles an advisory panel of teachers, scientists, and science educators to evaluate and review all materials before publication.

Everything needed to teach NSRC science courses—teacher's guide, student books, and equipment and materials—is available from the NSRC's publisher, Carolina Biological Supply Company (www.carolinacurriculum.com).



NSRC Curriculum:

- ▶ Aligns with the National Science Education Standards of the National Research Council
- ▶ Was developed through a rigorous research process
- ▶ Has been field-tested with diverse student populations
- ▶ Provides age-appropriate opportunities for children to expand their conceptual understanding
- ▶ Offers students opportunities to apply newly learned concepts and skills to their everyday lives and to other curriculum
- ▶ Incorporates opportunities for reading and reflection, discussion and analysis, and writing and independent study
- ▶ Incorporates assessment tools and critical implementation needs
- ▶ Has been assessed by external evaluators and reviewed by master teachers, scientists, and engineers

Improving Literacy through Science Resources

The Science and Technology for Children BOOKS series provides a literacy complement to the 12 STC units appropriate for grades 4 through 6 (see chart for titles). These readers help teachers link students' science activities to other areas of the curriculum, particularly history, language arts, and social studies. They provide an excellent means of meeting the National Research Council's National Science Education Standards, as well as most state science standards. And they are unique in that they highlight work being done by scientists at the world's foremost museum complex—the Smithsonian Institution. These books are available from the National Academies Press (www.nap.edu) individually, in sets of eight of a single title, in a Life and Earth Science library of six titles, in a Physical Science and Technology library of six titles, or in a complete set of all 12 titles. They are also included as part of the appropriate STC unit materials from Carolina Biological Supply Company (www.carolina.com/stc).

The NSRC has begun development of readers to accompany the K–3 and middle school courses. Check the NSRC's Web site, www.nsrconline.org, for details on development of these books.

Other Useful Curriculum Resources from the NSRC

- ▶ *STC Meets the Standards* provides a complete analysis of the science content standards met by the various units in the Science and Technology for Children® program. Information regarding STC's alignment with the national standards is available at the Carolina Biological Supply Company Web site, www.carolinacurriculum.com; click on "Correlations."
- ▶ *The Guide to Probeware and Computer Applications for STC/MS* supplements the STC/MS curriculum. This guide contains probeware and computer technology applications that allow students to use equipment that is more sensitive during lab experiments. These applications may replace or enhance inquiries in individual STC/MS courses.
- ▶ *Annotated resource guides* on other research-based curricula evaluated by panels of teachers and scientists who used carefully developed criteria based on the National Science Education Standards: *Resources for Teaching Elementary School Science*, *Resources for Teaching Middle School Science*, and *Science for All Children* (Book and Video/CD). All of these guides are available from the National Academies Press (www.nap.edu).



The Learning Cycle

Each STC unit and STC/MS module is based on a four-stage learning cycle that is grounded in educational research and practice. Students:

1. *Focus* on what they already know about a topic.
2. *Explore* a scientific phenomenon or concept, following a well-structured sequence of classroom investigations.
3. *Reflect* on their observations, record them in science journals, draw conclusions, and share their findings with others.
4. *Apply* their learning to real-life situations and to other areas of the curriculum.

The STC Program™

STC®

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	Technology of Paper

* Under Development

STC/MS™

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	