2005 NSRC

Inquiry-Based Science Education Programs

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- NSF-supported curriculum
- Professional development for teachers
- Science education outreach programs
- NEW—Teacher's Guides and STC BOOKS™

National Science Resources Center

THE NATIONAL ACADEMIES Smithsonian Institution

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THE NATIONAL SCIENCE RESOURCES CENTER

An organization of the Smithsonian Institution and the National Academies

"I view the National Science Resources Center as a major national and international resource for empowering teachers, scientists, and school districts."

—Bruce Alberts, President, National Academy of Sciences, Chair, National Research Council

In 1985, the leaders of the Smithsonian Institution and the National Academies established the **National Science Resources Center (NSRC)** to address the critical problem identified by the *A Nation at Risk* report. The report called attention to how far American students lagged behind the rest of the developed world in science and math education. The NSRC was created with a mission to improve the teaching and learning of science and to actively promote science education reform.

The National Science Resources Center offers a unique advantage to teachers and students by its ability to access the knowledge and expertise of two of the most prestigious scientific institutions in the world. The National Academies and the Smithsonian Institution provide the NSRC with research and scientific and engineering expertise to inform its services and products. The National Academies is comprised of the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council. These national academies combine to work outside the framework of government to ensure independent advice on matters of science, technology, and medicine. Knowledge of research and application of best practices are critical to the development of effective NSRC programs.

The NSRC offers regional, national, and international science education programs, as well as technical assistance, through its three integrated Centers of Excellence. These research-based programs help school districts throughout the nation and the world implement effective inquiry-centered science programs for all students. These centers include the Curriculum Development Center, the Leadership and Assistance for Science Education Reform (LASER) Center, and the Professional Development Center.

CURRICULUM DEVELOPMENT CENTER

Through its Curriculum Development Center and in partnership with its publisher, Carolina Biological Supply Company, the NSRC developed two comprehensive science curriculum programs for K–8 students: Science and Technology for Children® (STC®), for grades K–6; and Science and Technology Concepts for Middle Schools™ (STC/MS™), for grades 6–8. The NSRC designed these research-based and inquiry-centered curriculum programs to align with the National Science Education Standards of the National Research Council. In 2004, the NSRC self-published 12 science books (STC BOOKS™) to add a literacy component to the 4th through 6th grade STC units.

LEADERSHIP AND ASSISTANCE FOR SCIENCE EDUCATION REFORM (LASER) CENTER

The LASER Center was established with support from the National Science Foundation to leverage a decade of NSRC experience in working with school districts in reforming their K–8 science education programs. Through LASER Center strategic planning institutes, ongoing programs, and networking opportunities, local leaders get access to national expertise, tools, and resources that help them improve the quality of science for their children

PROFESSIONAL DEVELOPMENT CENTER

The NSRC's professional development courses provide teachers with the opportunity to learn science content and practice the skills needed to create supportive classroom environments for student inquiry. These courses move teachers through all levels of the teaching proficiency continuum from novice to expert.

For more information on the NSRC visit www.nsrconline.org.

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Introduction to the STC and STC/MS Curricula

Science and Technology for Children® (STC®) is a comprehensive, research-based K–6 science curriculum consisting of 24 instructional units that explore the life, earth, and physical sciences and technological design. Developed by the National Science Resources Center (NSRC) and published by Carolina Biological Supply Company, STC lays the groundwork for **Science and Technology Concepts for Middle Schools™ (STC/MS™),** an eight-module research-based science program developed by the NSRC for students in grades 6–8. Both programs were developed with major support from the National Science Foundation. Each STC unit is based on a four-stage learning cycle that is grounded in educational research and practice (see sidebar).

During STC's extensive research and development process, scientists and educators, including experienced elementary schoolteachers, acted as consultants to teacher-developers who wrote the units. Each STC unit was trial taught in classrooms in the Washington, D.C., area, then field-tested in ethnically diverse school districts across the nation. In addition, the assessment section in each unit was evaluated by the Program Evaluation and Research Group of Lesley College, Cambridge, Massachusetts. The final editions of the units incorporate teacher and student feedback and technical reviews by leading scientists and science educators on the STC Advisory Panel.

The STC program is based on research that 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 first-hand. STC units provide students with opportunities to learn age-appropriate concepts and skills and to acquire scientific attitudes and habits of mind. The curriculum's design allows students to work independently as well as cooperatively to do investigations; ask questions; make and test predictions; record, reflect on, and share their findings; and apply the skills and knowledge they have gained to new situations. Students continue through a progression of experiences that culminate in the 6th grade with the design of controlled experiments.

Since publication of the first STC units in 1991, the program has gained widespread recognition as an exemplary science curriculum with strong content and pedagogy. However, STC offers other strengths as well. The 24 units in the STC program were designed to accommodate a variety of learning styles and to appeal to students from diverse cultural backgrounds. As a result, STC units are being used in thousands of elementary school classrooms throughout the United States.

THE GOALS OF THE PROGRAM

The primary goals of the STC program are to:

- contribute to students' conceptual understanding of science at a level that is appropriate to their stage of cognitive development
- help children develop scientific attitudes and habits of mind, such as curiosity, respect for evidence, the capacity for critical reflections, flexibility, and respect for living things
- develop students' scientific reasoning and critical thinking

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

- First, students **focus** on what they already know about a topic.
- Next, students **explore** a scientific phenomenon or concept, following a well-structured sequence of classroom investigations.
- Third, students **reflect** on their observations, record them in science journals, draw conclusions, and share their findings with others.
- Finally, students **apply** their learning to real-life situations and to other areas of the curriculum.

Science and Technology Concepts for Middle Schools™ (STC/MS™) is an 8-module, inquiry-centered, middle school science curriculum developed by the National Science Resources Center (NSRC). Each STC/MS module provides opportunities for students to experience scientific phenomena firsthand. A comprehensive, research-based curriculum, STC/MS is aligned with the National Science Education Standards (NSES) of the National Research Council (NRC). Each STC/MS module is based on a four-stage learning cycle that is grounded in educational research and practice (see pg. 2, sidebar).

The STC/MS program builds on the skills and knowledge developed in the STC® curriculum, with content balanced among the life sciences, earth sciences, physical sciences, and technology. The development of each module involved working with teachers, scientists, and evaluators and were field-tested in urban, suburban, and rural classrooms nationwide. The materials are professionally evaluated and reviewed by an advisory panel of teachers, scientists, and science educators before publication. A rigorous evaluation resulted in the following statement by Joseph Pedulla, Ph.D., of The Center for the Study of Testing, Evaluation, and Education Policy (CSTEEP) at Boston College: "*…Students exposed to the STC/MS curriculum…outperformed the national and international groups.*"

The modules can be sequenced as two one-year courses, each year consisting of a module from each of the four science strands, or as four one-semester courses for earth science, life science, physical science, and technology. Everything needed to teach an STC/MS module—teacher's guide, student books, and the equipment and materials to conduct each lesson's inquiries—is available from Carolina Biological Supply Company.

Use of the STC and STC/MS programs is not limited to American schools. STC units have been translated into other languages, allowing them to be taught abroad in countries such as Sweden, Mexico, and Brazil. STC/MS is being used in Chile. The NSRC also offers a suite of learning opportunities for teachers of the STC and STC/MS curricula. For details on the NSRC's Professional Development Center, see pages 48-49.

"Consistent, statistically significant differences provided evidence to support the contention that the…curriculum units were more effective in teaching the scientific concepts assessed than were the more traditional instructional approaches….Students exposed to the STC/MS curriculum…outperformed the nation and international groups."

—Joseph Pedulla, Ph.D., The Center for the Study of Testing, Evaluation, and Education Policy (CSTEEP) at Boston College

The NSRC's K–8 Science Education Curriculum program

Curriculum	Grade Level*	Life and Earth Sciences		Physical Sciences and Technology	
Science and Technology for Children® (STC®)	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**
	6	Experiments with Plants**	Measuring Time**	Magnets and Motors**	The Technology of Paper**
Science and Technology Concepts for Middle Schools™ (STC/MS™)	6–8	Human Body Systems	Catastrophic Events	Properties of Matter	Energy, Machines, and Motion
		Organisms—From Macro to Micro	Earth in Space	Light	Electrical Energy and Circuit Design
	* Indicates *suggested* grade level. ** Indicates an STC unit for which there is currently a corresponding STC BOOK (see pgs.14–15).				

"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

STC® K–3 Grade Units Correlated to the NSES K–4 Science Content Standards

Developed for Grades	K/1	K/1	K/1	K/1	2	2	2	2	3	3	3	3
Unit Titles	Organisms	Weather	Solids and Liquids	Comparing and Measuring	The Life Cycle of Butterflies	Soils	Changes	Balancing and Weighing	Plant Growth and Development	Rocks and Minerals	Chemical Tests	Sound
Science as Inquiry												
Abilities necessary to do scientific inquiry	●	●	●	●	●	●	●	●	●	●	●	●
Understandings about scientific inquiry	●	●	●	●	●	●	●	●	●	●	●	●
Physical Science												
Properties of objects and materials		●	●	●		●	●	●		●	●	●
Position and motion of objects			●	●				●				●
Light, heat, electricity, and magnetism			●				●			●	●	
Life Science												
Characteristics of organisms	●				●	●			●			●
Life cycles of organisms	●				●				●			
Organisms and environments	●		●		●	●			●			●
Earth and Space Science												
Properties of earth materials			●			●	●		●	●	●	
Objects in the sky		●										
Changes in earth and sky		●	●				●			●		
Science and Technology												
Abilities of technological design				●		●	●	●	●			●
Understandings about science and technology	●	●	●	●	●	●	●	●	●	●	●	●
Abilities to distinguish between natural objects and objects made by humans	●	●							●	●	●	
Science in Personal and Social Perspectives												
Personal health		●	●		●		●				●	●
Characteristics and changes in populations												
Types of resources	●				●					●	●	
Changes in environments	●		●		●					●		
Science and technology in local challenges		●	●					●	●			●
History and Nature of Science												
Science as a human endeavor	●	●	●	●	●	●	●	●	●	●	●	●
Unifying Concepts and Processes												
Systems, order, and organization	●	●	●	●		●	●	●	●	●	●	●
Evidence, models, and explanation	●	●	●	●	●	●	●	●	●	●	●	●
Constancy, change, and measurement	●	●	●	●	●	●	●	●	●	●	●	●
Evolution and equilibrium								●		●		
Form and function	●		●	●	●	●		●	●	●		●

STC® 4–5 Grade Units Correlated to the NSES K–4 Science Content Standards

Developed for Grades	4	4	4	4	5	5	5	5
Unit Titles	Animal Studies	Land and Water	Electric Circuits	Motion and Design	Microworlds	Ecosystems	Food Chemistry	Floating and Sinking
Science as Inquiry								
Abilities necessary to do scientific inquiry	●	●	●	●	●	●	●	●
Understandings about scientific inquiry	●	●	●	●	●	●	●	●
Physical Science								
Properties of objects and materials		●	●	●	●	●	●	●
Position and motion of objects		●		●				●
Light, heat, electricity, and magnetism			●		●			
Life Science								
Characteristics of organisms	●				●	●	●	
Life cycles of organisms	●				●	●		
Organisms and environments	●	●				●		
Earth and Space Science								
Properties of earth materials		●				●		
Objects in the sky								
Changes in earth and sky		●						
Science and Technology								
Abilities of technological design	●	●	●	●		●		●
Understandings about science and technology	●	●	●	●	●	●	●	●
Abilities to distinguish between natural objects and objects made by humans	●	●			●	●	●	
Science in Personal and Social Perspectives								
Personal health			●				●	●
Characteristics and changes in populations								
Types of resources	●	●	●			●	●	
Changes in environments	●	●				●		
Science and technology in local challenges		●	●	●	●	●	●	●
History and Nature of Science								
Science as a human endeavor	●	●	●	●	●	●	●	●
Unifying Concepts and Processes								
Systems, order, and organization	●	●	●	●	●	●	●	●
Evidence, models, and explanation	●	●	●	●	●	●	●	●
Constancy, change, and measurement	●	●	●	●		●	●	●
Evolution and equilibrium	●	●		●		●		●
Form and function	●	●	●	●	●	●	●	●

STC® 4–6 Grade Units Correlated to the NSES 5–8 Science Content Standards

Developed for Grades	4	4	4	4	5	5	5	5	6	6	6	6
Unit Titles	Animal Studies	Land and Water	Electric Circuits	Motion and Design	Microworlds	Ecosystems	Food Chemistry	Floating and Sinking	Experiments with Plants	Measuring Time	Magnets and Motors	The Technology of Paper
Science as Inquiry												
Abilities necessary to do scientific inquiry	●	●	●	●	●	●	●	●	●	●	●	●
Understandings about scientific inquiry	●	●	●	●	●	●	●	●	●	●	●	●
Physical Science												
Properties and changes of properties in matter		●	●				●	●			●	●
Motions and forces		●		●				●		●	●	
Transfer of energy			●	●	●					●	●	
Life Science												
Structure and function in living systems	●				●	●			●			
Reproduction and heredity	●				●	●			●			
Regulation and behavior	●	●			●	●			●		●	
Populations and ecosystems						●						
Diversity and adaptations of organisms	●				●				●			
Earth and Space Science												
Structure of the earth system		●				●						
Earth's history		●										
Earth in the solar system		●							●	●		
Science and Technology												
Abilities of technological design	●	●	●	●				●		●	●	●
Understandings about science and technology	●	●	●	●	●	●	●	●		●	●	●
Science in Personal and Social Perspectives												
Personal health	●		●			●	●	●			●	
Populations, resources, and environments		●				●						
Natural hazards		●				●						●
Risks and benefits		●				●	●					
Science and technology in society	●	●	●	●	●	●	●	●		●	●	●
History and Nature of Science												
Science as a human endeavor	●	●	●	●	●	●	●	●	●	●	●	●
Nature of science	●	●	●	●	●	●	●	●	●	●	●	●
History of science		●	●	●	●		●	●	●	●	●	●
Unifying Concepts and Processes												
Systems, order, and organization	●	●	●	●	●	●	●	●	●	●	●	
Evidence, models, and explanation	●	●	●	●	●	●	●	●	●	●	●	●
Constancy, change, and measurement	●	●	●	●		●	●	●	●	●	●	●
Evolution and equilibrium	●	●		●		●		●				
Form and function	●	●	●	●	●	●	●	●	●	●	●	●

STC/MS™ 6–8 Grade Modules Correlated to the NSES Science Content Standards

Developed for Grades	6–8	6–8	6–8	6–8	6–8	6–8	6–8	6–8
Module Titles	Human Body Systems	Catastrophic Events	Properties of Matter	Energy, Machines, and Motion	Organisms From Macro to Micro	Earth in Space	Light	Electrical Energy and Circuit Design
Science as Inquiry								
Abilities necessary to do scientific inquiry	●	●	●	●	●	●	●	●
Understandings about scientific inquiry	●	●	●	●	●	●	●	●
Physical Science								
Properties and changes of properties in matter		●	●					
Motions and forces				●		●		
Transfer of energy		●		●		●	●	●
Life Science								
Structure and function in living systems	●				●			
Reproduction and heredity					●			
Regulation and behavior	●							
Populations and ecosystems					●			
Diversity and adaptations of organisms	●				●	●		
Earth and Space Science								
Structure of the earth system		●				●		
Earth's history		●				●		
Earth in the solar system						●		
Science and Technology								
Abilities of technological design	●	●		●		●		●
Understandings about science and technology	●	●	●	●		●	●	●
Science in Personal and Social Perspectives								
Personal health	●	●	●	●			●	
Populations, resources, and environments					●			
Natural hazards		●	●			●	●	
Risks and benefits	●	●		●	●			
Science and technology in society		●	●	●	●	●	●	●
History and Nature of Science								
Science as a human endeavor	●	●	●	●	●	●	●	●
Nature of science	●	●	●	●	●	●	●	
History of science	●	●	●	●	●	●	●	●
Unifying Concepts and Processes								
Systems, order, and organization	●	●	●	●	●	●		●
Evidence, models, and explanation	●	●	●	●	●	●	●	●
Constancy, change, and measurement	●	●	●	●	●	●	●	●
Evolution and equilibrium	●	●		●	●	●		
Form and function	●	●	●	●	●	●	●	●

Integrating STC and STC/MS with Non-Science Curricula

Research about how the brain functions and how students learn has given momentum to the curriculum integration approach to instruction—teaching subject areas according to their natural connections rather than in isolation from one another. Teaching across the disciplines connects subjects in ways that reflect the real world, which in turn improves student understanding. Science and Technology for Children® provides an instructional program that teachers can use as a framework for integrating other areas of the curriculum, such as reading, writing, math, and social studies. Science and Technology Concepts for Middle Schools™ teacher's guides provide extensions that integrate each lesson with other curriculum areas.

LANGUAGE ARTS

All facets of a language arts program may be incorporated into the STC and STC/MS classroom. Children develop their reading, writing, speaking, and listening skills as they complete record sheets, maintain science notebooks, read stories about topics that they are studying in science class, and share findings in both formal and informal settings. Reading, however, is given special emphasis in STC because students who read well and widely build a strong foundation for learning in all areas of life.

Educational studies indicate that children are more likely to engage in a reading exercise when the literature is related to an activity in which they have just participated. Each STC and STC/MS unit's hands-on investigations provide a natural transition to literacy activities and each unit offers a variety of literacy methods and materials that give students opportunities to practice their reading skills and improve their reading comprehension.

The newest literacy component in the STC program is the Science and Technology for Children BOOKS™ series, which helps teachers link students' science activities to learning in other areas of the curriculum, particularly language arts, history, and social studies. The books provide an excellent means of meeting the National Science Education Standards as well as the state science standards. In addition, the entire series of books uniquely highlights work being done by scientists at one of the world's foremost museum complexes—the Smithsonian Institution. Many of these scientists assisted with the development of the stories in the STC BOOKS.

MATH AND OTHER SUBJECTS

The integration of mathematics with science activities occurs seamlessly within the STC and STC/MS units. Students develop math skills as they measure, weigh, compare, design data tables, perform calculations, and create graphs and charts. Stimulating ideas for the integration of other subjects (such as social studies and the arts) with science appear as extensions in every lesson. The extensions offer ideas for field trips, visits from local experts, ways to relate science to art and music, and a host of other activities. Each Teacher's Guide includes a bibliography that provides information on science trade books.

"Teachers are able to link science with other academic areas to capitalize on skills students have acquired as readers, writers, and mathematicians."
—D. Gail Sosa, Science Specialist, Alief Independent School District, Houston, Texas

INQUIRY-BASED SCIENCE: EVIDENCE OF IMPACT

"In high-quality teaching, the process of* inquiry, *not merely 'giving instruction,' is the very heart of what teachers do. Inquiry not only tests what students know, it presses students to put what they know to the test.... It teaches students not only what to learn but how to learn."

—Glenn Commission Report. Official citation: U.S. Department of Education. 2000. *Before It's Too Late: A Report to the Nation from The National Commission on Mathematics and Science Teaching for the 21st Century.* Washington, DC: U.S. Government Printing Office.

Many educators have long been convinced that inquiry-based learning and teaching of science promotes students' active involvement in their learning experiences. The inquiry approach helps students develop and retain scientific concepts and skills better than the traditional science textbook approach. Until recently, however, educators have had to base this assumption mostly on anecdotal evidence or experience in the classroom. Now, an emerging body of research is beginning to quantify the improvements in student achievement that result when quality inquiry instructional materials are fully implemented.

Evidence suggests that inquiry science—*teaching* science in the way that scientists *do* science—is the best way for students to *learn* science. The following examples provide evidence of the effectiveness of inquiry science learning and teaching.

California: Students in El Centro public schools who took inquiry science classes had average scores on the science section of the Stanford Achievement Test, 9th Edition, Form T, almost double the average of those of students who were not participating in such classes. Students with four years of participation scored well over twice as high as nonparticipants. Eighty-nine percent of students participating in inquiry science classroom work passed the California Writing Proficiency Assessment, compared to only 58% of nonparticipating students. Again, students' scores increased as their classroom experience with inquiry science increased.

Delaware: Since 1996, Delaware elementary students have learned science through inquiry-based instruction steeped in the principles of the NSRC. The program has been successful: Eighty-seven percent of Delaware public school fourth graders and 70% of sixth graders met or exceeded state science standards in the 2001 Delaware State Testing Program. In the 2003 assessments, 89% of fourth graders and 74% of sixth graders met or exceeded the standards. Another encouraging note: Although the scores of minority students still lag behind those of others, the gap is narrower in science than in any other academic area. In nearly half of the grade 4 science classrooms, there is essentially no achievement gap between white and African-American students.

Pennsylvania: A sample of Pittsburgh-area elementary students who had been taught using inquiry methods in their science classrooms performed as well as or better than a national/international sample of students in a sample of the Third International Mathematics and Science Study (TIMSS). Their test results were comparable to those of students from nations (Czech Republic, Hungary, Japan, Korea, and Singapore) whose students outperformed U.S. middle school students in the aggregate. The Pittsburgh-area inquiry students also significantly outperformed local students who had been taught science through a traditional textbook approach.

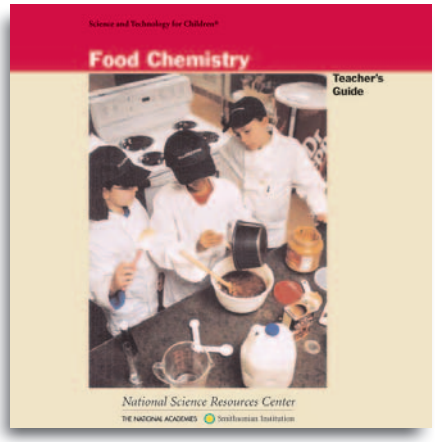
Chile: A group of Chilean educators has inaugurated an inquiry science education pilot program in several elementary schools in the Santiago area. The program uses seven units of the STC curriculum, with training of teachers in inquiry instructional methodologies, school-based science materials refurbishment centers, support from both school administration and the community, and continuous assessment. Teachers participating in the program report positive changes in classroom atmosphere, student motivation, the autonomy of learning, achievement of learning-disabled students, teachers' skills and knowledge, and collaboration between administration and teachers.

STC/MS Field Testing: It is standard operating procedure during curriculum development for the NSRC to submit each curriculum unit to field testing in classrooms and to have an independent evaluation conducted on each unit prior to final release of the product. The evaluation showed that all of the modules were more effective than conventional instruction in the same topic—that is, the students who participated in the field tests outperformed students who did not.

Improving Performance through Inquiry Science Education: Effective inquiry science programs are based on five elements of reform:

1. Inquiry-centered science curriculum units that have gone through a rigorous research and review process
2. Professional development programs that prepare teachers to support students in inquiry science
3. Cost-effective support systems for supplying science materials and apparatus to classrooms
4. Assessment methods consistent with the goals of, and aligned with, the instruction of an inquiry-centered science program
5. Strategies for building administrative and community support for science education reform.

STC and STC/MS Materials



STC Materials

Each STC kit come in a sturdy plastic container and provides the teacher materials, science supplies, and student materials needed to present a unit to a class of 30.

TEACHER'S GUIDE

The Teacher's Guide, bound in a sturdy three-ring binder, provides a wealth of information divided into the following sections.

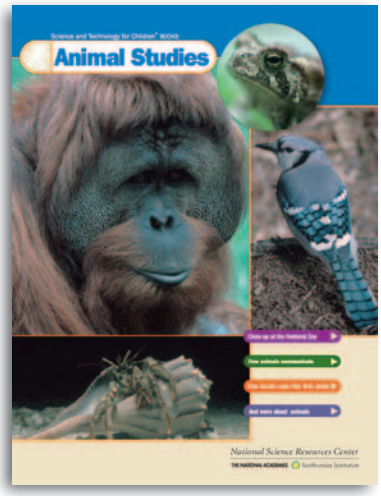
- STC Program Overview
- Unit Overview
- Materials Management and Safety
- Unit Investigations and Blackline Masters
- Student Assessment
- Student Notebooks and Writing
- Student Reading Resources
- Additional Learning Resources

STUDENT INVESTIGATION BOOKS

STC units for grades 3–6 include reusable Student Investigations books (formerly called Student Activity Books), which contain information to guide students through the activities in each lesson, reading selections, additional ideas to explore, and a glossary (the same one found in the Teacher's Guide). Student pairs can share the 15 Student Investigations books that come with the kit, or additional books may be purchased so each student has a copy. Spanish translations of these books are available on the *STC® en español* CD-ROM.

TEACHER RESOURCE VIDEOS

The kit for each STC unit also includes a teacher resource videotape. In the 30- to 45-minute tape, an STC master teacher demonstrates how to set up and use the materials in the unit's science kit. Interspersed with the teacher demonstrations are classroom scenes showing students engaged in unit activities. The tapes are also available for separate purchase.



SCIENCE AND TECHNOLOGY FOR CHILDREN BOOKS™

A new addition to the STC curriculum is the Science and Technology for Children BOOKS™ program, developed to address a growing concern in the education community: students' difficulty in gaining meaning from what they read. By presenting exciting ideas in an age-appropriate way, the books aim to help students improve their reading comprehension. To ensure the literacy component has been addressed, all books in the series are reviewed by a nationally recognized reading specialist. Each book presents topics designed to reinforce concepts in the units and expand and deepen students' understanding. Currently the STC BOOKS series includes books for the 4th to 6th grade STC units; books for the units from kindergarten to 3rd grade will be developed in the near future. A Teacher's Guide was developed to accompany each book in the series.

STC SCIENCE KIT

All STC kits contain the science equipment and materials to carry out classroom investigations. With the exception of a few commonly available materials, each kit includes everything the teacher needs. Teachers order any live organisms needed for a unit by returning to Carolina (via phone call, fax, or mail) an order sheet that is enclosed in the kit. The NSRC worked closely with Carolina to ensure that all materials in the STC kits meet high standards of performance and durability. Many of the STC kit components last through repeated uses. Consumable items can be replaced quickly and easily by purchasing from Carolina a prepackaged refurbishment set, or by line-item ordering (in small quantities or in bulk).

STC/MS Materials

Each STC/MS module comes in a sturdy plastic container and provides the teacher materials, science supplies, and student materials needed to present a unit to a class of 32.

TEACHER'S GUIDES

The Teacher's Guide, bound in a sturdy three-ring binder, provides a wealth of information divided into the following sections.

- Introduction to STC/MS Program
- Teaching Strategies
- Module Overview
- Lessons and Investigations

STUDENT GUIDE AND SOURCE BOOKS

The reusable student guides contain background information, step-by-step instructions that guide students through their classroom inquiries, reading selections, safety tips, and a glossary.

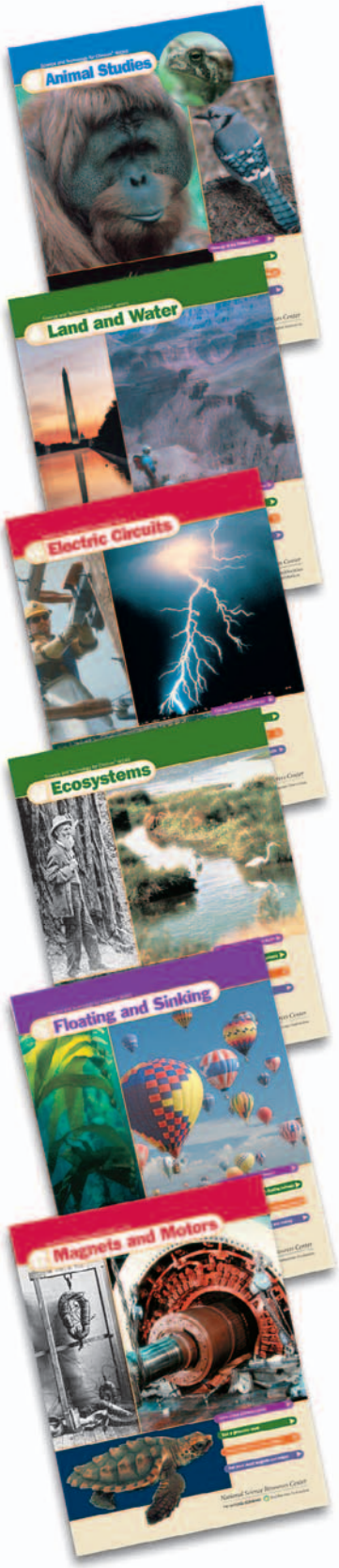
STC/MS BOOKS

STC/MS BOOKS for the 7th and 8th grades will be developed in the future.

STC/MS SCIENCE KITS

All STC/MS kits contain the science equipment and materials to carry out classroom investigations. With the exception of a few commonly available materials, each kit includes everything the teacher needs. Teachers order any live organisms needed for a unit by returning to Carolina (via phone call, fax, or mail) an order sheet that is enclosed in the kit. The NSRC worked closely with Carolina to ensure that all materials in the STC/MS kits meet high standards of performance and durability. Many of the STC/MS kit components last through repeated uses. Consumable items can be replaced quickly and easily by purchasing from Carolina a prepackaged refurbishment set, or by line-item ordering (in small quantities or in bulk).

Science and Technology for Children BOOKS™



According to the *National Assessment of Education Progress* report, "There is a serious need to improve our children's ability to read and understand complicated information. These skills are important to success in school, college, and the workplace." To meet this challenge, the National Science Resources Center has launched a new series, *Science and Technology for Children BOOKS*™, to add a literacy component to an NSF-funded curriculum program for elementary students. Each book is designed to be used in conjunction with a *Science and Technology for Children*® unit or as a stand-alone resource that conveys topics in a way that makes science interesting and relevant.

The *STC BOOKS* help teachers link students' science activities to learning in other areas of the curriculum, particularly history, language arts, and social studies. And the entire series of books provides a unique means of highlighting work being done by scientists at one of the world's foremost museum complexes—the Smithsonian Institution.

Each of the twelve *STC BOOKS* in the series is 64 pages long and colorfully illustrated with drawings and photographs, and each has been reviewed by a nationally recognized reading specialist. The books are available individually, or grouped as a classroom set of eight of the same title, as a science library set of all 12 books, as a Life and Earth Science library set of six books, or as a Physical Science and Technology library set of six books. All books in the series have an accompanying Teacher's Guide.

Written for 4th and 5th graders, ***Animal Studies*** presents stories on the diversity of animal life, from amphibians and sea creatures to birds and land mammals. Several stories focus on examples of animal behaviors and on how those behaviors help animals survive and thrive. One story will help students learn to recognize different animals by the trails they leave behind. The book also includes the story of a keeper at the Smithsonian's National Zoo in Washington, D.C., as well as stories about pioneering animal scientists, such as Charles Darwin and Jane Goodall. *(Life and Earth Science) ISBN 1-933008-00-8*

Land and Water tells 4th and 5th graders the story of how the Earth formed and how it continues to change, imperceptibly but inexorably, through the action of earthquakes and volcanoes, rivers and oceans. It includes stories on the importance of water in our lives, not only for drinking but also what happens to our crops when we don't have enough of it. There is also a story on the aesthetics of water, told through an ancient Chinese painting of a river scene. The final section of this book highlights scientists' investigations of natural phenomena, including a history of weather forecasting. *(Life and Earth Science) ISBN 1-933008-01-6*

Electric Circuits gives 4th and 5th graders an overview of electricity—how it was discovered, how people put it to work, how it works in living organisms, and what scientists are still learning about it. The book opens with the time-honored story of Benjamin Franklin and his experiments that proved that lightning is a form of electricity. Another story tells of the American inventor Thomas Edison, whose practical application of electricity has helped shape the modern world. One section of this book outlines the path that electricity takes from a power plant to the living room. Finally, the book looks at electricity in nature, from electric eels in the water to lightning in the skies. *(Physical Science and Technology) ISBN 1-933008-02-4*

Motion and Design contains stories about how the structure of organisms helps them function in nature, and how scientists and inventors develop and refine the design of devices we use every day. The book is written for 4th and 5th graders. In the first section of the book, students will learn how birds and insects fly and how creatures as different as flying squirrels and dolphins have unique features that help them move swiftly and efficiently in search of food and safety. There are also stories on how scientists and inventors—from the innovations of Leonardo da Vinci to the technological spoofs of Rube Goldberg—have developed an array of machines to help us move around on earth and in space. *(Physical Science and Technology) ISBN 1-933008-03-2*

Before the microscope was invented in the 1500s, people were unaware of the tiny world of microorganisms that exists all around us—and inside of us. Students in 4th and 5th grades can learn about the microscope when they read the stories in ***Microworlds***—and they can find instructions in the book on how to make a simple microscope of their own. There are enlarged pictures of microscopic creatures—from bacteria to worms—and a story on the role of microorganisms in making flamingos pink. Students will learn that microorganisms—harmful and helpful—are an important part of our world. *(Life and Earth Science) ISBN 1-933008-04-0*

Ecosystems gets 4th and 5th graders thinking of ecosystems—what they are, what threatens them, and what scientists and others are doing to keep them in balance. The first section of the book introduces students to basic concepts about ecosystems, from a brief ecological vocabulary lesson to information about the interrelationships of animals with the land and plants in their range. One story presents the theory that a global catastrophe led to the extinction of dinosaurs. Other stories discuss threats to Earth's ecosystems and ways that people can minimize those threats. The final section of the book relates the stories of three environmental pioneers: Henry David Thoreau, John Muir, and Rachel Carson. *(Life and Earth Science)*
ISBN 1-933008-05-9

Food Chemistry, appropriate for 4th and 5th graders, offers a comprehensive overview of how food influences our health. Students learn about balanced diets by exploring the differences among carbohydrates, protein, and fats; the interaction between food and the body during digestion; and special diets. One story discusses what astronauts eat while they spend long stretches of time in space, why astronauts' food is packaged as it is, and how the space program has influenced our daily diet. The book also includes a healthy seafood recipe collected and published by Smithsonian scientists. *(Physical Science and Technology) ISBN 1-933008-06-7*

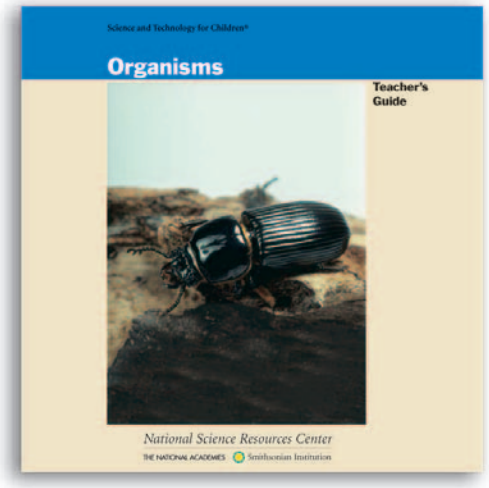
The stories in ***Floating and Sinking*** introduce 4th and 5th grade students to the science behind why objects float and sink in air and water. Part 1 discusses the study of floating and sinking, including a story about the only president to have been awarded a U.S. patent. Several of the stories describe how scientists and engineers have put science to use in inventions such as ships, submarines, and balloons; others include descriptions of the ways that the uses of boats determine how they are designed and built. The final series of stories in the book explores floating and sinking in nature, including ways that children can determine their capacity to float or sink in water. *(Physical Science and Technology) ISBN 1-933008-07-5*

Experiments with Plants introduces 5th and 6th graders to the world of plants—what they are, how they reproduce and grow, how they add to scientific knowledge, and how they have influenced history. The book includes instructions on how students can grow plants without soil—hydroponically. One part of the book tells about other animals—not just bees—that pollinate plants, and why some plant and animal species team up better than others to facilitate pollination. Other stories relate the contributions of pioneering plant geneticist Gregor Mendel, horticulturist and inventor George Washington Carver, and horticulturist Luther Burbank, as well as those of Thomas Jefferson. *(Life and Earth Science) ISBN 1-933008-08-3*

Measuring Time, for 5th and 6th graders, covers the history of measuring time and the evolution of timekeeping. And although we've become used to having clocks help us structure our lives, accurate clocks are new inventions, the result of the need for sailors to be able to know where they were at sea. Looking backward in time, the book tells how geologists can tell the age of landforms such as the Grand Canyon and from that can determine the ages of other places as well. Other stories show how nature's creatures—including people—regulate their lives though internal "clocks." *(Life and Earth Science)*
ISBN 1-933008-09-1

Magnets and Motors is about electricity and magnetism and how they work together. This basic relationship has made possible the invention of many useful devices, including electric motors and generators. Students in 5th and 6th grades learn how people discovered the force of magnetism and how some animals—the loggerhead turtle, for example—use this force to navigate great distances. Students will also read about how scientists and inventors harnessed the power of magnetism to help bring electricity to broad areas—and about what happens when this power fails. *(Physical Science and Technology)*
ISBN 1-933008-10-5

Paper is everywhere, so we tend to take it for granted. But although paper is essential to our way of life, it is a relatively new invention, produced in quantity only since the 1600s. ***Technology of Paper*** tells 5th and 6th graders about paper—what people used before paper was invented, how it is produced, the many uses that people have discovered for it, and how it can be preserved and recycled. One of the stories in this book tells how conservators at the National Archives protect the Declaration of Independence, the Constitution, the Bill of Rights and other historic national documents from damage due to light, moisture, insects, and time. Another story explores how paper is used in many surprising ways including making furniture. *(Physical Science and Technology) ISBN 1-933008-11-3*



Organisms

Science and Technology for Children®

Organisms (catalog #971101B) is a 16-lesson unit designed for elementary students in grades K–1. Each classroom-tested unit gives children the opportunity to discover the similarities and differences between plants and animals as they become more aware of the diversity of life. By observing and taking care of a number of different plants and animals, students begin to develop positive attitudes and sensitivity towards living things.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

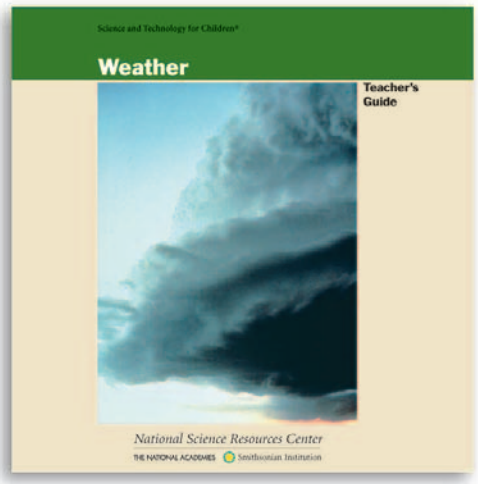
NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES K–1

For ordering information, see page 56.



Weather

Science and Technology for Children®

In *Weather* (catalog #971201B), students in grades K–1 are introduced to the concept of weather and how it affects our lives. Using a variety of tools, students observe, discuss, measure, and record data on cloud cover, precipitation, wind, and temperature. They learn how to read a thermometer and construct a rain gauge to measure precipitation. They also study cloud formations and use a wind scale to estimate the speed of wind. To apply their new skills and knowledge, students compare their own weather predictions with an actual weather forecast.

UNIT LENGTH

Eight weeks of instruction

NEW

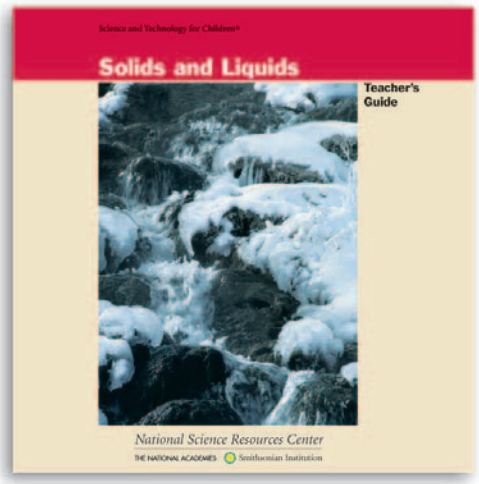
UNIT COMPONENTS

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES K–1

For ordering information, see page 56.



Solids and Liquids

Science and Technology for Children®

In *Solids and Liquids* (catalog #971401B), students in grades K–1 investigate the similarities and differences in a variety of common solids and liquids. First, they observe, describe, and compare a collection of solid objects, focusing on such properties as color, shape, texture, and hardness. They also perform tests to determine whether the objects roll or stack and float or sink, as well as whether they are attracted to a magnet. Investigations of liquids focus on how various liquids look and feel, their viscosity, how they mix with water, and their degree of absorption. In a final lesson, students compare the properties of solids and liquids and identify how they are similar and different.

GRADES K–1

UNIT LENGTH

Eight weeks of instruction

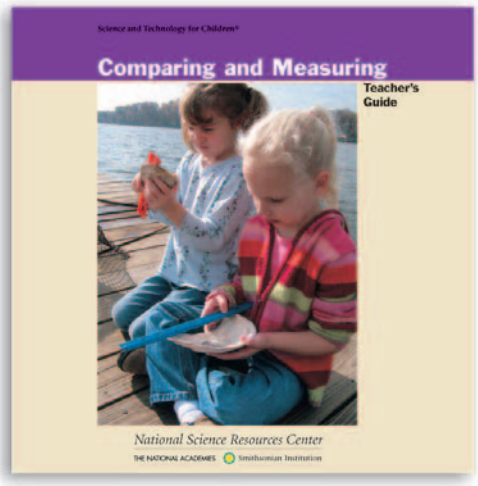
UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

For ordering information, see page 56.



Comparing and Measuring

Science and Technology for Children®

GRADES K–1

In *Comparing and Measuring* (catalog #971301B), children in grades K–1 explore the concepts that underlie the science skills of comparing and measuring. Initially, students compare lengths by matching measuring tape to their own heights and the lengths of their arms and legs. They make the transition from matching to measuring length by quantifying nonstandard units of measure (in this case, their own feet) and discover that using nonstandard units of measure produces varied results. Finally, students use standard units of measure, such as Unifix® cubes and measuring strips, to measure height, width, and distance. In so doing, students begin to understand key measuring concepts, such as using beginning and ending points, a common starting line, and standard units of measure.

UNIT LENGTH

Eight weeks of instruction

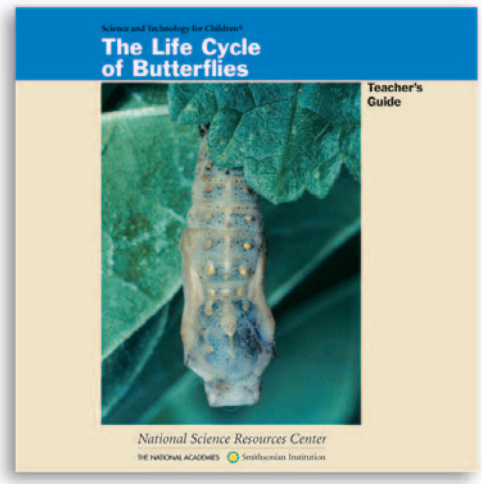
UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

For ordering information, see page 56.



The Life Cycle of Butterflies

Science and Technology for Children®

In *The Life Cycle of Butterflies* (catalog #971501B), children in grades 2–3 are introduced to the concept of life cycles by investigating one organism—the Painted Lady butterfly *(Vanessa cardui)*. During an eight-week period, students observe, record, and describe the metamorphosis from caterpillar to chrysalis and from chrysalis to butterfly. In many cases, they watch the butterfly lay eggs. The butterfly ultimately dies a natural death, thereby completing students' observations of the life cycle. The children compare the life cycle of the butterfly with that of other organisms, an experience that deepens their understanding of the diversity of life and the patterns that characterize animal life cycles.

GRADES 2–3

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

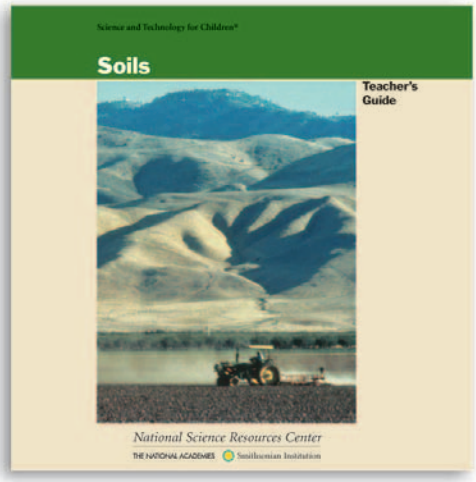
- New ©2005 Teacher's Guide
- Teacher Instructional Videotape
- *STC en español* CD-ROM
- Hands-on Materials Kit

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

"STC is hands-on but it's also minds-on. I like to use the example of* The Life Cycle of Butterflies. *I tell parents, don't be surprised if your child becomes the resident butterfly expert. Second to none after this unit because of its richness of content."

— Peggy Willcuts, Elementary Science Education Specialist, Walla Walla School District, Walla Walla, Washington

For ordering information, see page 56.



Soils

Science and Technology for Children®

In *Soils* (catalog #971601B), children in grades 2–3 investigate the chief components of soil—sand, clay, and humus—and explore the relationship between soil and plant growth. Early in the unit, they create their own compost bags. This activity enables them to observe the decomposition of organic materials over time. Students observe and read about earthworms to learn about their connection to plant roots and soil. The students also conduct tests that enable them to observe and compare such properties of soil as odor, appearance, and texture. Phenomena such as settling, water content, and soil consistency are also explored. These observations are then related to plant growth as students plant cucumber seeds in a clear plastic tube. By observing root growth, students learn about the role of roots in keeping the plant anchored and upright. In a final activity, students apply what they have learned as they investigate a sample of local garden soil.

GRADES 2–3

UNIT LENGTH

Eight weeks of instruction

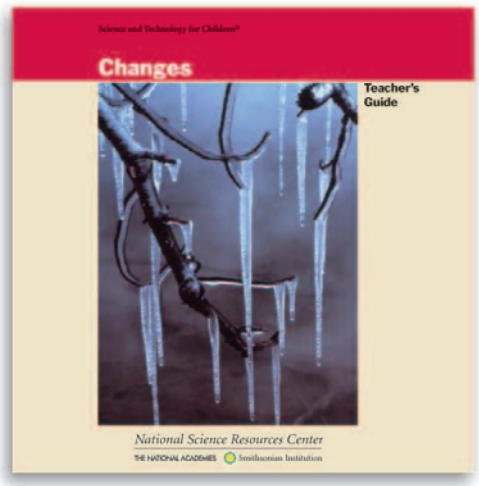
UNIT COMPONENTS

NEW

- New ©2005 Teacher's Guide
- Teacher Instructional Videotape
- *STC en español* CD-ROM
- Hands-on Materials Kit

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

For ordering information, see page 56.



Changes

Science and Technology for Children®

In *Changes* (catalog #971801B), students in grades 2–3 expand their understanding of solids, liquids, and gases by exploring changes in state. They investigate freezing, melting, evaporation, and condensation of water. In a sequence of lessons, students produce a mixture of two solids and a mixture of solids with liquids and observe the results. They work through several methods to separate mixtures: sieving, filtration, evaporation, and chromatography. The students set up races that involve sugar dissolving in water and observe the effects of particle size and water temperature on the rate at which the sugar dissolves. They also observe crystals formed as a result of evaporation. Students observe some changes that occur immediately and some that occur over time, and they begin to recognize the characteristics of chemical reactions. They investigate rusting, and they observe and collect the gas formed by mixing an effervescent tablet in water. Students have several opportunities to practice their new skills in lessons in which they devise ways of separating a mystery mixture and plan and carry out investigations that involve other changes.

GRADES 2–3

UNIT LENGTH

Eight weeks of instruction

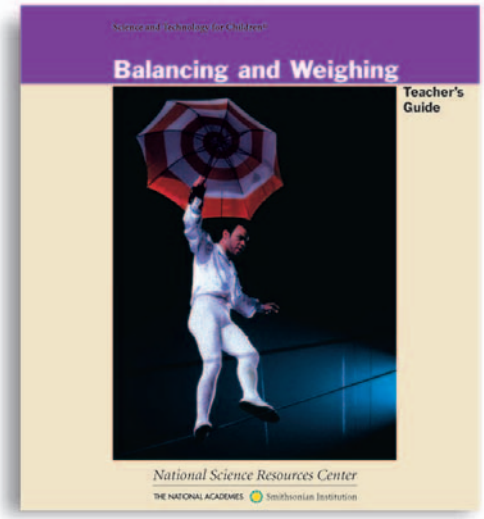
UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

For ordering information, see page 56.



Balancing and Weighing

Science and Technology for Children®

Balancing and Weighing (catalog #971701B) introduces students in grades 2–3 to the relationship between balance and weight. Experiences with a beam balance introduce students to the concept that balance is affected by amount of weight, position of weight, and position of the fulcrum. Working with an equal-arm balance challenges students to place objects in serial order on the basis of weight and to appreciate that weighing is the process of balancing an object against a certain number of standard objects. In the final lessons, students turn to a series of problem-solving investigations with the equal-arm balance and cupfuls of four different foods.

GRADES 2–3

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

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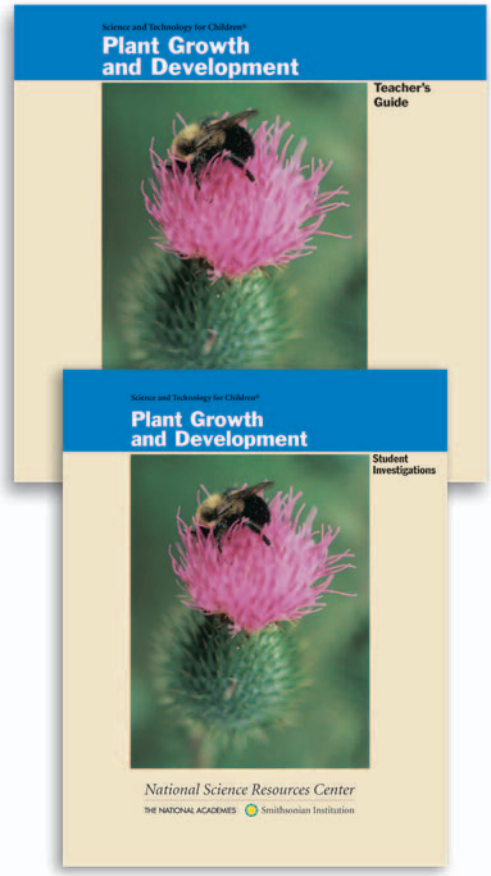
For ordering information, see page 56.



Plant Growth and Development

Science and Technology for Children®

Plant Growth and Development (catalog #971901B) is a 16-lesson unit designed for elementary students in grades 2–3. This unit gives students an opportunity to observe every stage in the life cycle of a simple plant. Working with Wisconsin Fast Plants™ *(Brassica rapa)*, which germinate, mature, and go to seed within a 40-day period, students plant seeds and watch the seedlings emerge. As they watch their plants grow, students learn that plants need nutrients from the soil, as well as water and light, to thrive. These experiences deepen students' understanding of the characteristics of living organisms and their relationship with and dependence on their environment.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES 2–3

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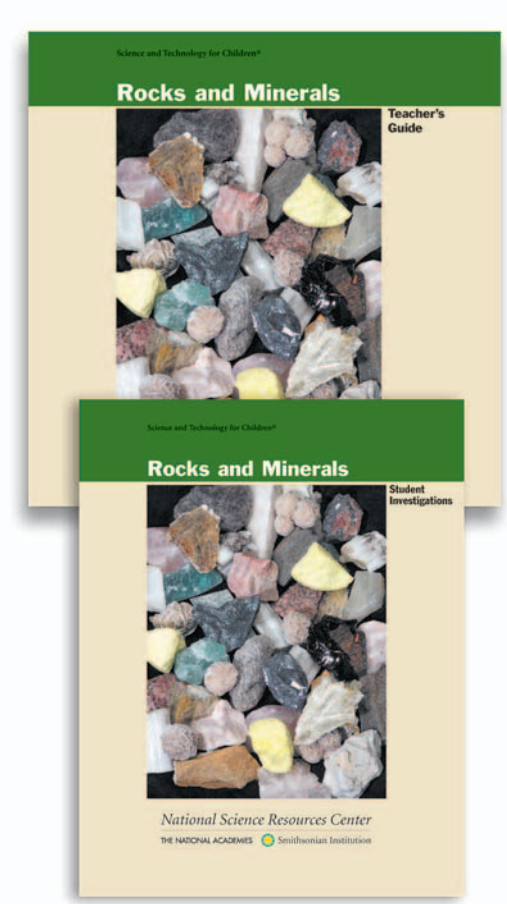


Rocks and Minerals

Science and Technology for Children®

Rocks and Minerals (catalog #972001B) is a 16-unit lesson designed for students in grades 2–3. This unit gives students an opportunity to explore the differences and similarities between rocks and minerals by investigating samples of these earth materials, performing a series of tests similar to geologists' field tests, and reading about rocks and minerals and how they are used. In a culminating activity, they are challenged to apply their knowledge and skills to identify new minerals. They then report on how rocks and minerals are used.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

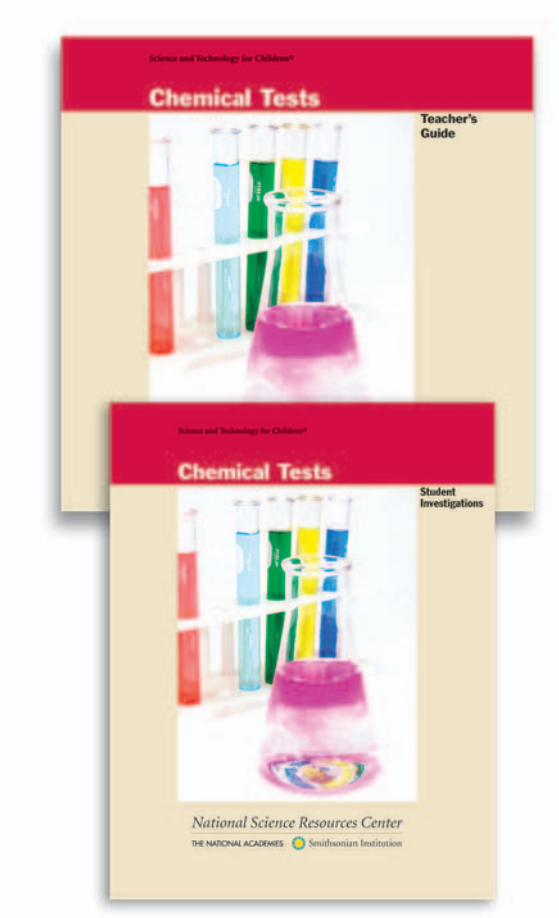
NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES 2–3

For ordering information, see page 56.



Chemical Tests

Science and Technology for Children®

Chemical Tests (catalog #972101B), a 16-unit lesson, is designed to introduce students in grades 2–3 to the science of chemistry by challenging them to explore and determine the identity of five common household chemicals: sugar, alum, talc, baking soda, and cornstarch. A series of tests enables students to explore phenomena such as crystallization and to observe the processes of evaporation and filtration. As a result of conducting these investigations, students develop scientific skills such as observing and recording results, forming conclusions on the basis of experience, communicating results, and applying their knowledge to solve problems.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

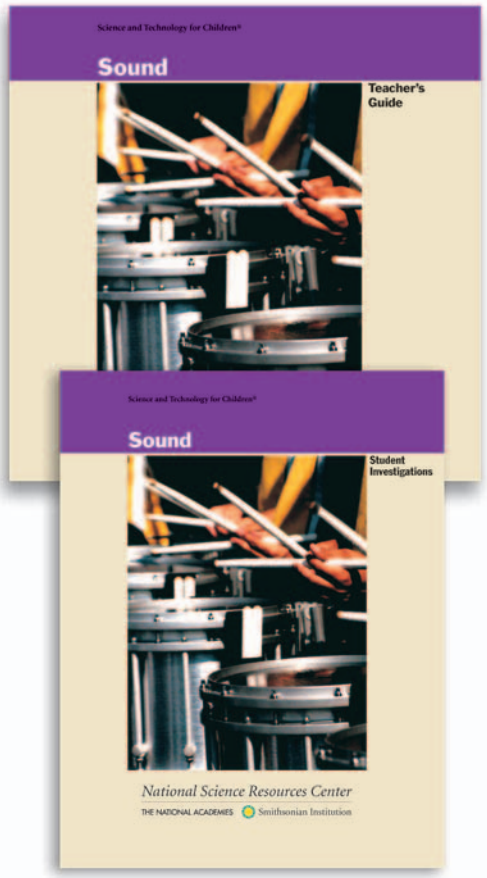
NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **Hands-on Materials Kit**

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES 2–3

For ordering information, see page 56.



Sound

Science and Technology for Children®

Sound (catalog #972201B) is a 16-lesson unit designed for students in grades 2–3. Using tuning forks, slide whistles, strings, and other sound-producing objects, students investigate the characteristics of sound. They learn that sound is caused by vibrations, and they explore how sound travels. They learn about the relationship of pitch and volume to the frequency and amplitude of vibrations. They apply what they learn in the unit by designing and building musical instruments or other sound-producing devices.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

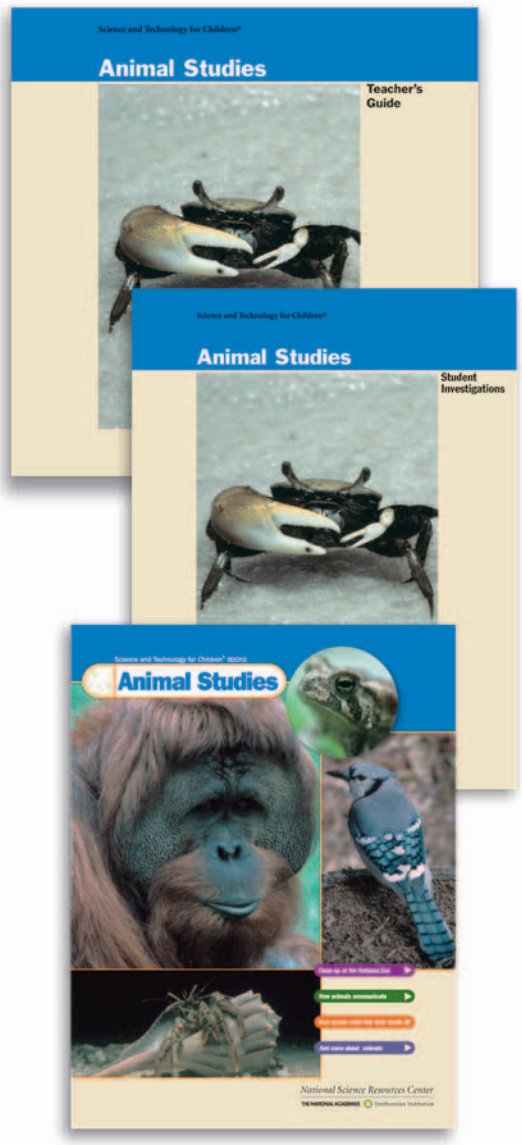
NEW

- New ©2005 Teacher's Guide
- Teacher Instructional Videotape
- Student Investigations
- *STC en español* CD-ROM
- Hands-on Materials Kit

Each unit kit equips one class of 30 and comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

GRADES 2–3

For ordering information, see page 56.



Animal Studies

Science and Technology for Children®

In *Animal Studies* (catalog #972401B), students in grades 4–5 care for and study three animals from different habitats—the dwarf African frog, the fiddler crab, and the millipede. Students learn about what animals need to survive, the main features of their anatomical structure, and the ways in which they are suited for life in a particular environment. Students create and maintain individual logs in which they record their observations of each animal over time, focusing on behavior, including eating, movement, and protection. Toward the end of the unit, students apply what they have learned about structure, habitat, survival needs, and behavior to study a fourth classroom animal: the human. They also conduct an animal research project and decide how they will present their findings to the class.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Animal Studies***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

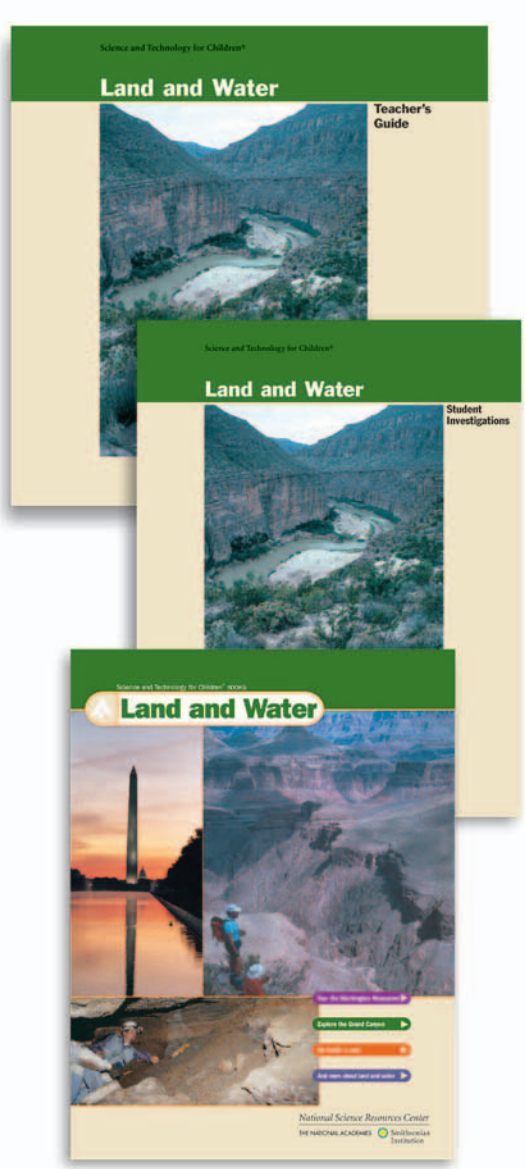
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Animal Studies*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Animal Studies*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Animal Studies* (ISBN 1-933008-00-8) presents stories on the diversity of animal life, from amphibians and sea creatures to birds and land mammals. Several stories focus on examples of animal behaviors, and on how those behaviors help animals survive and thrive. One story will help students learn to recognize different animals by the trails they leave behind. The book also includes the story of a keeper at the Smithsonian's National Zoo in Washington, D.C., as well as stories about pioneering animal scientists, such as Charles Darwin and Jane Goodall.

GRADES 4–5

For ordering information, see page 56.



Land and Water

Science and Technology for Children®

In *Land and Water* (catalog #972301B), students in grades 4–5 investigate the interactions between land and water. Using a stream table as their model, students observe how runoff causes stream formation; how groundwater forms; how soil is eroded, transported, and deposited; and how water shapes land. Through observing the model, manipulating certain parts of it, and testing interactions under various conditions, students discover how water changes the shape of land and how land formations, in turn, affect the flow of water.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Land and Water***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

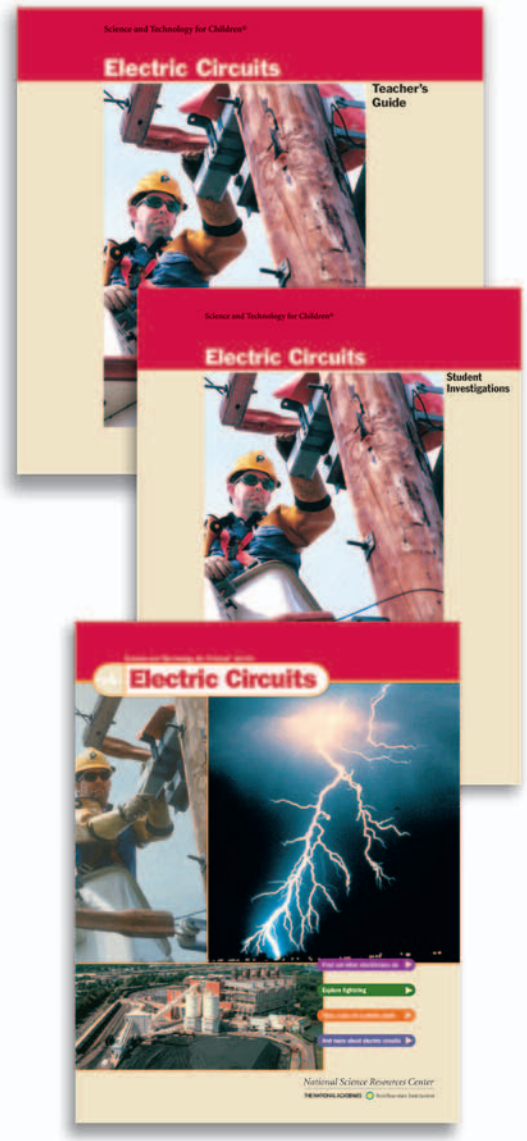
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Land and Water*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Land and Water*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Land and Water* (ISBN 1-933008-01-6) tells the story of how the Earth formed and how it continues to change through the action of earthquakes and volcanoes, rivers and oceans. It includes stories on the importance of water in our lives, not only for drinking but also what happens to our crops when we don't have enough of it. The final section of this book highlights scientists' investigations of natural phenomena, including a history of weather forecasting.

GRADES 4–5

For ordering information, see page 56.



Electric Circuits

Science and Technology for Children®

In *Electric Circuits* (catalog #972601B), students in grades 4–5 are first introduced to the basic properties of electricity through studying electric circuits and the parts of a light bulb. Next, students learn about conductors and insulators and about the symbols used to represent the parts of a circuit in circuit diagrams. Students also explore different kinds of circuits, learn about switches, construct a flashlight, and investigate the properties of diodes. Finally, students apply their knowledge and skills to wire a cardboard house.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Electric Circuits***
- **Hands-on Materials Kit**

NEW

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

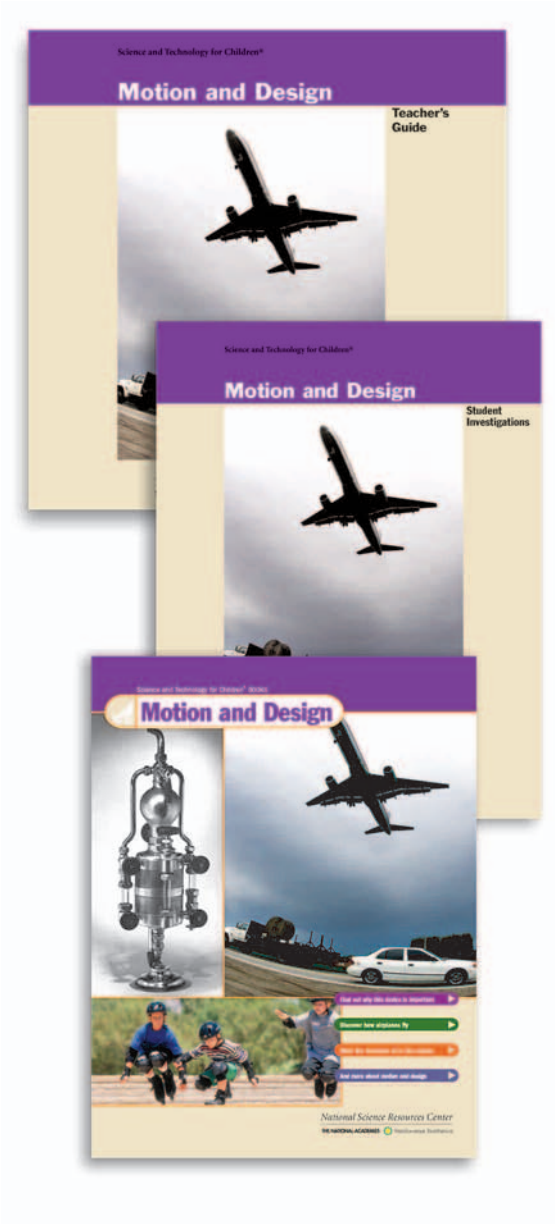
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Electric Circuits*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Electric Circuits*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Electric Circuits* (ISBN 1-933008-02-4) gives students an overview of electricity—how it was discovered, how people put it to work, how it works in living organisms, and what scientists are still learning about it. The book opens with the time-honored story of Benjamin Franklin and his experiments that proved that lightning is a form of electricity. One section of this book outlines the path that electricity takes from a power plant to the living room. Finally, the book looks at electricity in nature, from electric eels in the water to lightning in the skies.

GRADES 4–5

For ordering information, see page 56.



Motion and Design

Science and Technology for Children®

In *Motion and Design* (catalog #973001B), students in grades 4–5 explore the physics of motion and apply these concepts to technological design. Using plastic construction materials, weights, rubber bands, and propellers, students design and build vehicles. Students record their designs using technical two-view and three-view drawings. They test how fast the vehicles move and use their findings to redesign the vehicles to make them move more efficiently. As students design their vehicles, they intuitively apply concepts such as friction and kinetic and potential energy. They also explore the effect of gravity on motion. The unit concludes by challenging students to solve a design challenge and to present their findings to the class.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Motion and Design***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

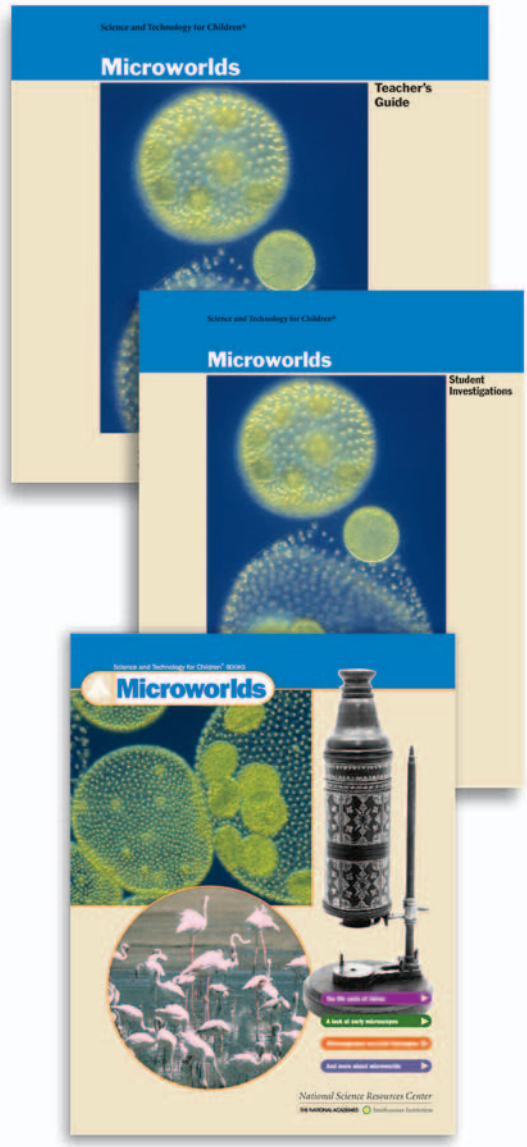
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Motion and Design*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Motion and Design*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Motion and Design* (ISBN 1-933008-03-2) contains stories about how the structure of organisms helps them function in nature, and how scientists and inventors develop and refine the design of devices we use every day. In the first section of the book, students will learn how birds and insects fly and how creatures as different as flying squirrels and dolphins have unique features that help them move swiftly and efficiently in search of food and safety. There are also stories on how scientists and inventors—from the innovations of Leonardo da Vinci to the technological spoofs of Rube Goldberg—have developed an array of machines to help us move around on earth and in space.

GRADES 4–5

For ordering information, see page 56.



Microworlds

Science and Technology for Children®

Microworlds (catalog #972701B) gives students in grades 4–5 an opportunity to examine everyday objects as well as microorganisms with a variety of magnifying devices. They begin by investigating several common objects with the unaided eye. Using a variety of lenses they learn that a magnifying lens must be transparent and curved. Next, students use a microscope to view inanimate objects. They learn proper focusing and lighting techniques, as well as how to prepare slides. Students prepare a section of onion and observe its cells. Students' attention then turns to living specimens. Using a microscope, they view three microorganisms—*Volvox, Blepharisma,* and the vinegar eel worm. They study the cell structure of these organisms and observe how the organisms feed, grow, and reproduce. In a final challenge, students use the microscope to examine cultures they have grown from hay and grass infusions.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Microworlds***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

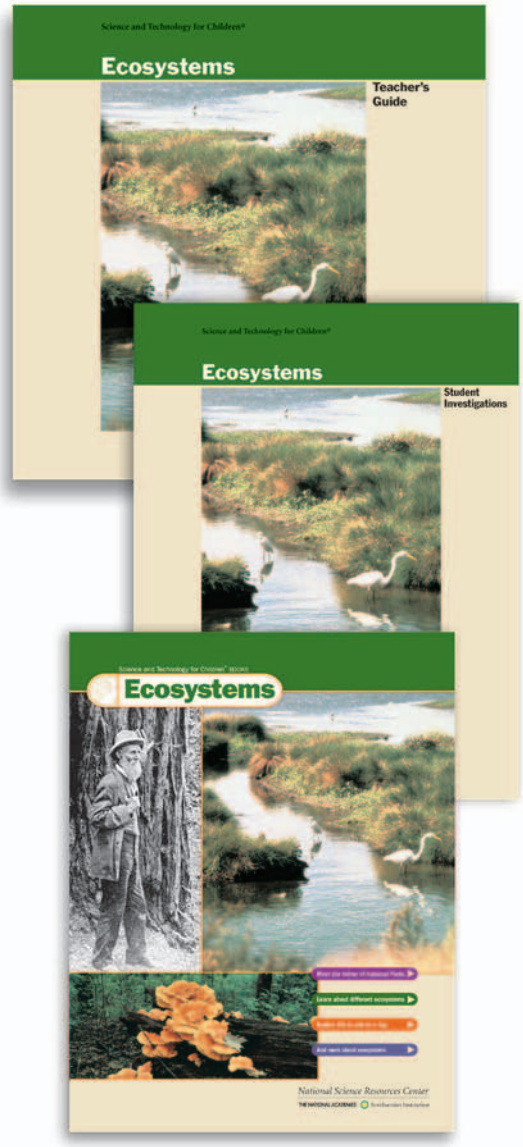
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Microworlds*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Microworlds*

The STC BOOK™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. In *Microworlds* (ISBN 1-933008-04-0) students can find instructions in the book on how to make a simple microscope of their own. There are enlarged pictures of microscopic creatures—from bacteria to worms—and a story on the role of microorganisms in making flamingos pink. Students will learn that microorganisms—harmful and helpful—are an important part of our world.

GRADES 4–5

For ordering information, see page 56.



Ecosystems

Science and Technology for Children®

In *Ecosystems* (catalog #972801B), students in grades 4–5 begin the unit by setting up a terrarium in which they grow grass, mustard, and alfalfa plants. They then add crickets and isopods. They also set up an aquarium into which they introduce snails, guppies, elodea, algae, and duckweed. By connecting the terrarium and aquarium bottles to create an "ecocolumn," students are able to observe the relationship between the two environments and the organisms living within them. Using test ecocolumns that contain only plants, students simulate the effects of pollutants on an environment. Students then use a food chain wheel to see the effects these pollutants might have on their own miniature ecosystems. Later, students read about, explore, and discuss the Chesapeake Bay as a model ecosystem. They analyze this ecosystem from the viewpoint of various users—waterman, dairy farmer, land developer, recreational boater, and resident—and present their findings to the class.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Ecosystems***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

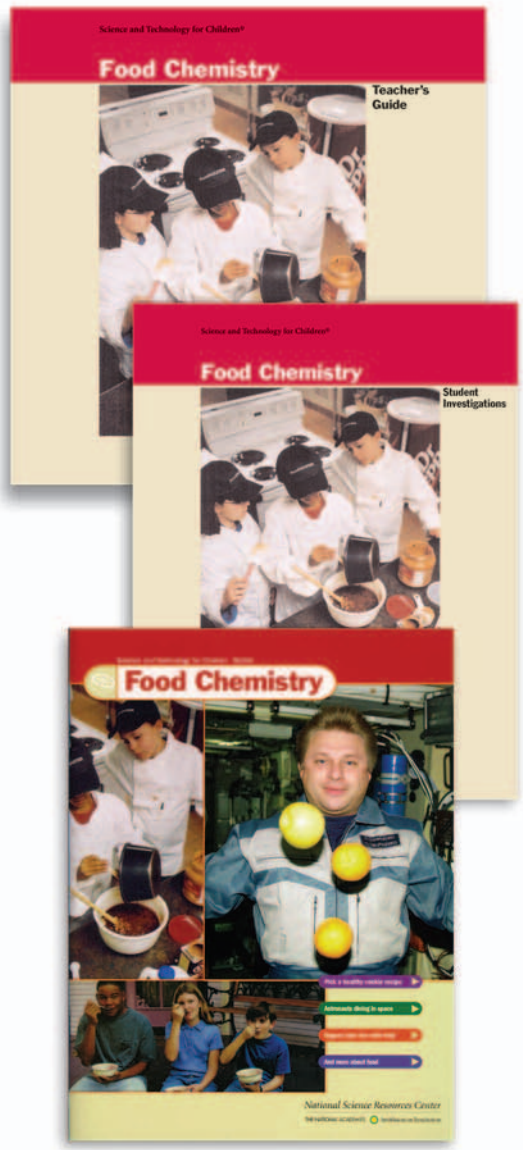
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Ecosystems*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Ecosystems*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Ecosystems* (ISBN 1-933008-05-9) gets students thinking about ecosystems—what they are, what threatens them, and what scientists and others are doing to keep them in balance. The first section of the book introduces students to basic concepts about ecosystems, from a brief ecological vocabulary lesson to information about the interrelationships of animals with the land and plants in their range. One story presents the theory that a global catastrophe led to the extinction of dinosaurs. Other stories discuss threats to Earth's ecosystems and ways that people can minimize those threats. The final section of the book relates the stories of three environmental pioneers: Henry David Thoreau, John Muir, and Rachel Carson.

GRADES 4–5

For ordering information, see page 56.



Food Chemistry

Science and Technology for Children®

Food Chemistry (catalog #972901B) gives students in grades 4–5 an opportunity to explore basic concepts related to food and nutrition. They set up their own classroom laboratory and perform physical and chemical tests to identify the presence of starch, glucose, fats, and proteins in common foods. Some of the tests are relatively simple and produce "yes-or-no" results; others require multiple steps. Still other tests, such as the glucose test, produce results that require interpretation. Through readings, students discover how proteins, fats, and carbohydrates, as well as vitamins, are related to good health. They also learn how to interpret food labels. In a final challenge, students apply their knowledge and skills to analyze the nutritional components of a marshmallow.

UNIT LENGTH

Eight weeks of instruction

NEW

UNIT COMPONENTS

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Food Chemistry***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

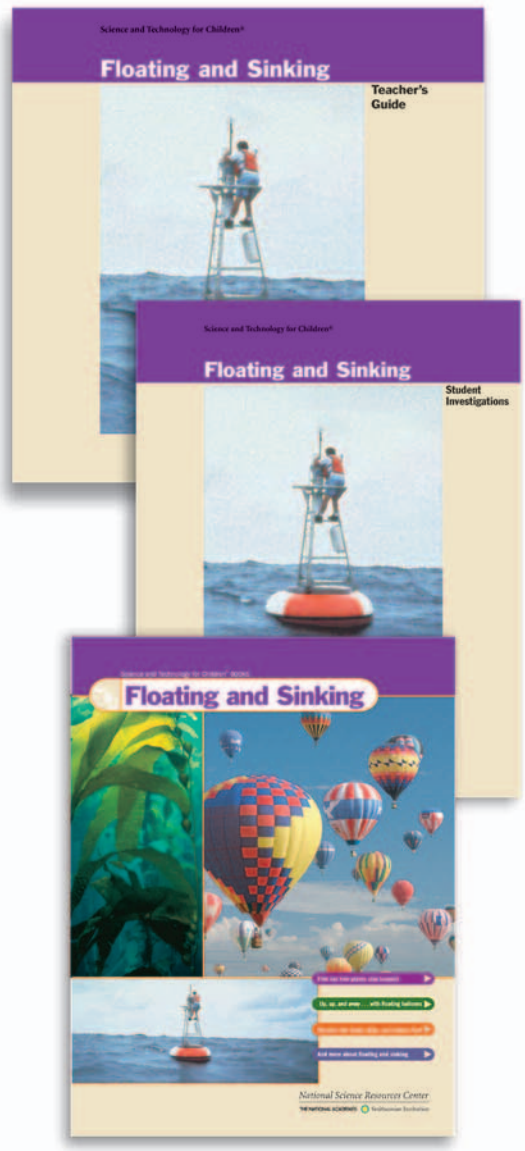
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Food Chemistry*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Food Chemistry*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Food Chemistry* (ISBN 1-933008-06-7) offers a comprehensive overview of how food influences our health. Students learn about balanced diets by exploring the differences among carbohydrates, protein, and fats; the interaction between food and the body during digestion; and special diets. One story discusses what astronauts eat while they spend long stretches of time in space, why astronauts' food is packaged as it is, and how the space program has influenced our daily diet. The book also includes a healthy seafood recipe collected and published by Smithsonian scientists.

GRADES 4–5

For ordering information, see page 56.



Floating and Sinking

Science and Technology for Children®

In *Floating and Sinking* (catalog #972501B), students in grades 4–5 study the phenomenon of buoyancy. They begin by making a spring scale with which they weigh various objects. They make clay boats, test their boats' buoyancy, and discover that altering the shape of the boats affects buoyancy. Students are then challenged to design a boat that has a certain loading capacity. These experiments allow them to witness several surprising phenomena; for example, some "floaters" are heavier than some "sinkers," and large objects are not always heavier than smaller objects. Students then turn their attention to differences between objects placed in fresh water and in salt water. They construct a hydrometer that compares the levels at which objects float in both types of water.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

NEW

- **New ©2005 Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Floating and Sinking***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

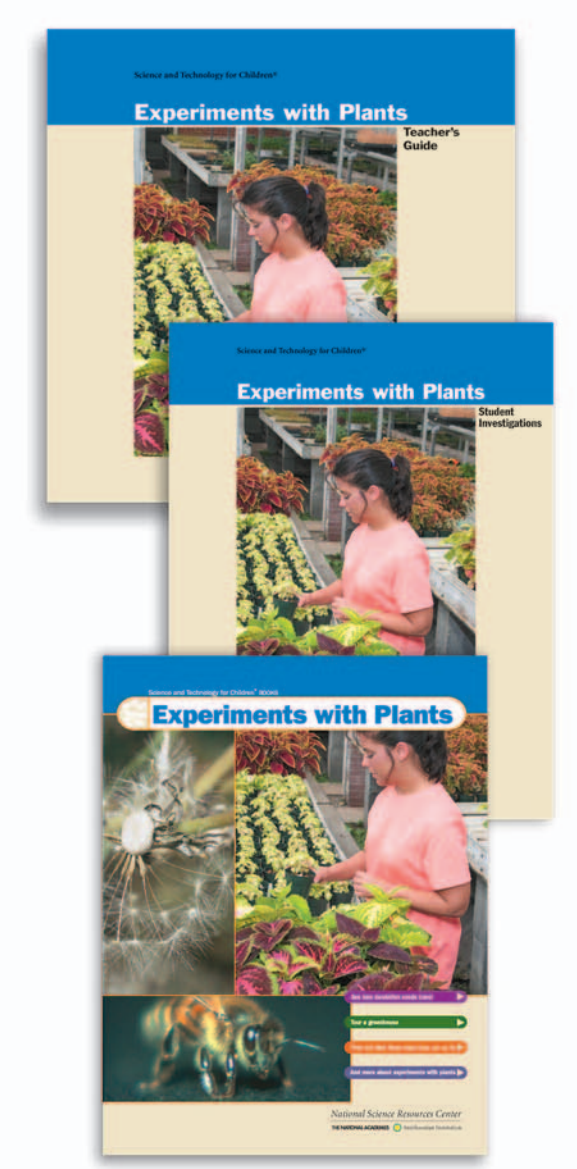
- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Floating and Sinking*
- The non-consumable and consumable materials needed to teach the unit

STC BOOKS: *Floating and Sinking*

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. The stories in *Floating and Sinking* (ISBN 1-933008-07-5) introduce students to the science behind why objects float and sink in air and water. Part 1 discusses the study of floating and sinking, including a story about the only president to have been awarded a U.S. patent. Several of the stories describe how scientists and engineers have put the science to use in inventions such as ships, submarines, and balloons; others include descriptions of the ways that the uses of boats determine how they are designed and built. The final series of stories in the book explores floating and sinking in nature, including ways that children can determine their capacity to float or sink in water.

GRADES 4–5

For ordering information, see page 56.



Experiments with Plants

Science and Technology for Children®

In *Experiments with Plants* (catalog #973101B), students in grade 6 apply the knowledge and skills they have gained in earlier STC® life science units to investigate some of the variables that affect plant growth and development. The main objective of the unit is to enable students to design and conduct a controlled experiment. Working in teams, students formulate a question about a plant and carry out a controlled experiment designed to answer that question. During the ensuing weeks, they observe the plants and record their data. Each team then shares its results with the class. Final activities entail germinating seeds that students have gathered from the plants and exploring tropisms.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Experiments with Plants***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Experiments with Plants*
- The non-consumable and consumable materials needed to teach the unit

GRADE 6

STC BOOKS: *Experiments with Plants*

NEW

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4-6. *Experiments with Plants* (ISBN 1-933008-08-3) introduces students to the world of plants—what they are, how they reproduce and grow, how they add to scientific knowledge, and how they have influenced history. The book includes instructions on how students can grow plants without soil—hydroponically. One part of the book tells about other animals—not just bees—that pollinate plants, and why some plant and animal species team up better than others to facilitate pollination. Other stories relate the contributions of pioneering plant geneticist Gregor Mendel, horticulturist and inventor George Washington Carver, and horticulturist Luther Burbank, as well as those of Thomas Jefferson.

For ordering information, see page 56.

Measuring Time

Science and Technology for Children®

In the first part of the unit *Measuring Time* (catalog #973201B) students in grade 6 explore the use of natural phenomena to keep time. In the second section, students conduct experiments using some of the instruments that have been used to keep time throughout the centuries. They build and experiment with a water clock and investigate the characteristics of the pendulum. Finally, they apply what they have learned to assemble and evaluate a clock escapement and modify the device in order to make it more accurate. The unit provides students with an opportunity to learn how to measure time, to investigate machines, to explore concepts such as energy and motion, and to learn about the science of astronomy.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Measuring Time***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Measuring Time*
- The non-consumable and consumable materials needed to teach the unit

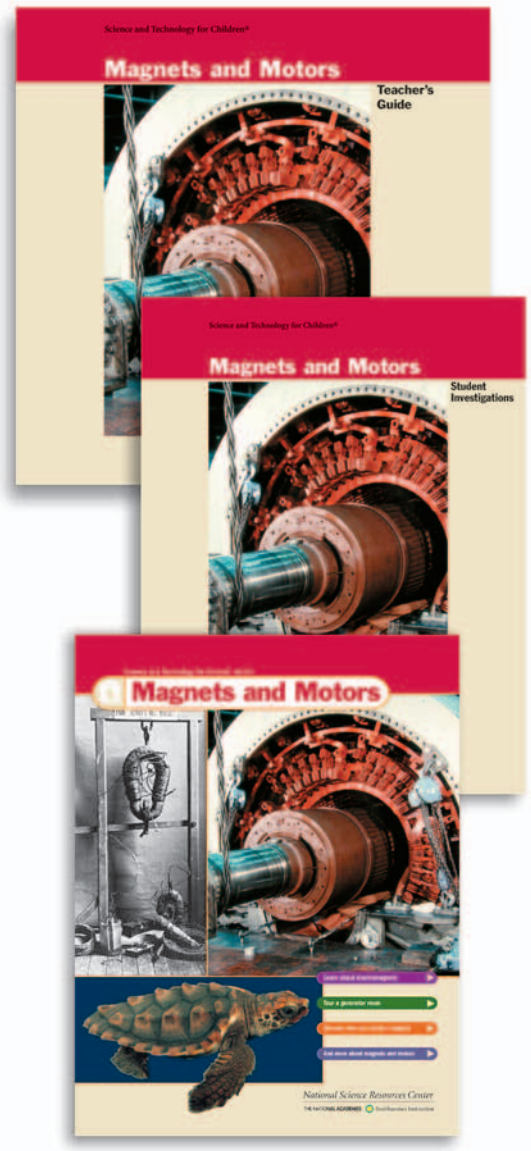
GRADE 6

STC BOOKS: *Measuring Time*

NEW

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Measuring Time* (ISBN 1-933008-09-1) covers the history of measuring time and the evolution of timekeeping. And although we've become used to having clocks help us structure our lives, accurate clocks are new inventions, the result of the need for sailors to be able to know where they were at sea. Looking backward in time, the book tells how geologists can tell the age of landforms such as the Grand Canyon and from that can determine the ages of all other places as well. Other stories show how nature's creatures—including people—regulate their lives through internal "clocks."

For ordering information, see page 56.



Magnets and Motors

Science and Technology for Children®

This unit, *Magnets and Motors* (catalog #973401B), offers students in grade 6 the opportunity to explore the properties of magnets and the magnetic properties of electric currents. The unit includes information on the historical development of scientists' understanding of the use of magnetism, electricity, and electromagnetism. Students begin by studying magnets and making a compass. They then investigate the relationship between magnetism and electricity as they explore the characteristics of switches and circuits. Finally, students experiment with three different motors. Applying their learning and experience, they dismantle, experiment with, and reassemble a manufactured motor.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Magnets and Motors***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Magnets and Motors*
- The non-consumable and consumable materials needed to teach the unit

GRADE 6

STC BOOKS: *Magnets and Motors*

NEW

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Magnets and Motors* (ISBN 1-933008-10-5) is about electricity and magnetism and how they work together. This basic relationship has made possible the invention of many useful devices, including electric motors and generators. Students learn how people discovered the force of magnetism and how some animals—the loggerhead turtle, for example—use this force to navigate great distances. Students will also read about how scientists and inventors harnessed the power of magnetism to help bring electricity to broad areas—and about what happens when this power fails.

For ordering information, see page 56.

The Technology of Paper

Science and Technology for Children®

In this unit, *The Technology of Paper* (catalog #973301B), 6th grade students explore the properties of paper, make paper by hand, and understand how the properties of paper relate to how it is used. By testing six types of paper for smoothness, tear-resistance, opacity, water-resistance, and ink receptivity, students deepen their understanding of the relationship between the properties of a certain type of paper and its intended uses. Students read about industrial papermaking and explore hand papermaking. Using the class hand-papermaking process, students investigate the role of additives and of embedding and embossing in the creating of paper with a variety of properties. In a final activity, students apply their learning and experience to work through a four-step technological design process as they create their own recycled-paper product.

UNIT LENGTH

Eight weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Teacher Instructional Videotape**
- **Student Investigations**
- ***STC en español* CD-ROM**
- **New STC BOOK: *Technology of Paper***
- **Hands-on Materials Kit**

Each unit kit comes in one or more large, durable plastic containers with hinged, lockable lids. To learn how to use this exemplary program in your classroom, go to www.carolina.com/STC.

Each kit equips one class of 30 and includes:

- 1 Teacher's Guide
- 15 Student Investigations
- 8 STC BOOKS: *Technology of Paper*
- The non-consumable and consumable materials needed to teach the unit

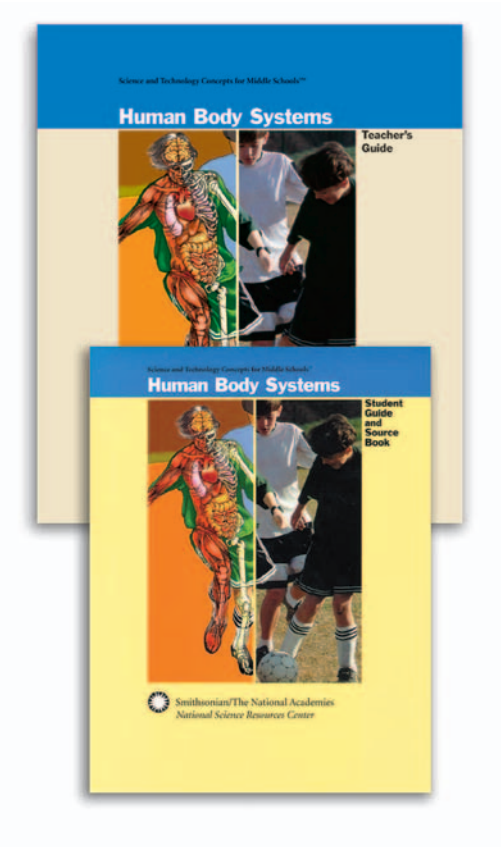
STC BOOKS: *Technology of Paper*

NEW

The STC BOOKS™ series enhances and extends STC's inquiry-based investigations with engaging reading materials for grades 4–6. *Technology of Paper* (ISBN 1-933008-11-3) tells 5th and 6th graders about paper—what people used before paper was invented, how it is produced, the many uses that people have discovered for it, and how it can be preserved and recycled. One of the stories in this book tells how conservators at the National Archives protect the Declaration of Independence, the Constitution, the Bill of Rights, and other historical documents from damage due to light, moisture, insects, and time. Another story explores how paper is used in many surprising ways, including making furniture.

GRADE 6

For ordering information, see page 56.



Human Body Systems

Science and Technology Concepts for Middle Schools™

In *Human Body Systems* (catalog #974006), students in grades 6–8 study how the human body works. Use this hands-on science module to tap middle school students' natural curiosity about the human body and then extend their knowledge. The module's 23 lessons are divided into three parts:

- **The Digestive System**—Students trace nutrients as they are processed by the digestive system, pass into the blood, and are transported to body cells.
- **The Respiratory and Circulatory Systems**—Students explore the breathing mechanism: how oxygen enters the body, passes into the blood, and is transported to body cells, and where it combines with digested food to release energy. Students also use a siphon-pump model to explore the double-pump action of the heart, which leads to an investigation of heart rate and the factors that affect it.
- **The Musculoskeletal System**—This series of lessons deals with the musculoskeletal system's use of energy released during respiration. Students investigate the nature of joints and how muscles, bones, and nerves work together.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**
- **Student Web site www.stcms.si.edu**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

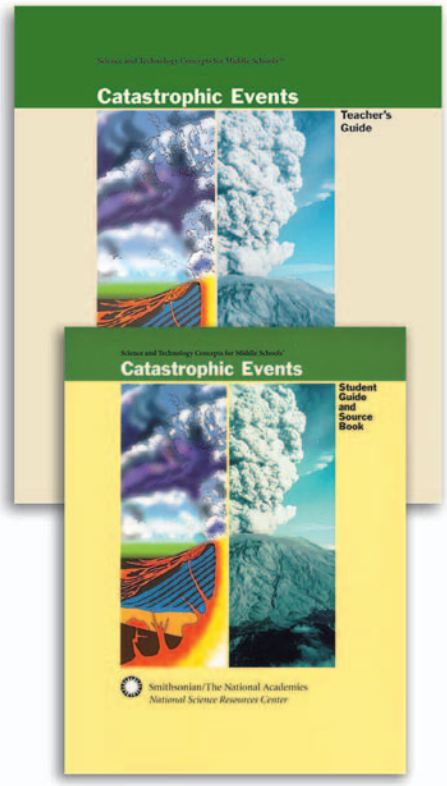
A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

High-quality professional development is essential for effective science education. It is especially valuable when it ties into the curriculum that teachers are using. The National Science Resources Center offers professional development courses tailored to its curricula: Science and Technology for Children® (STC®) for teachers of K–6 students and Science and Technology Concepts for Middle Schools™ (STC/MS™) for teachers of students in grades 6–8. For further information, check the Web site at www.nsrconline.org, contact the NSRC Professional Development Center at 202-287-7307, or send an email to nsrcpdcenter@si.edu.

GRADES 6–8

For ordering information, see page 56.



Winner of the National Oceanic and Atmospheric Administration (NOAA) Mark Trail Award

Catastrophic Events

Science and Technology Concepts for Middle Schools™

In *Catastrophic Events* (catalog #974206), students in grades 6–8 study Earth's naturally occurring catastrophic events. Through hands-on science activities, students use a globe to assess geologic and atmospheric patterns on Earth that are related to storms, earthquakes, volcanoes, and other natural phenomena. The module's 25 lessons are divided into three parts:

- **Storms**—Students investigate the causes and effects of thunderstorms, tornadoes, and hurricanes. They also analyze methods of monitoring and forecasting these events. Concepts include local and global heating, convection, the water cycle and cloud formation, air pressure, and the analysis of weather maps. The first part ends with students investigating ocean currents and their effect on global weather patterns.
- **Earthquakes**—Students focus on wave motion, earthquake data, and the factors that cause earthquakes. Plate motion and the structure of Earth are introduced in the context of plate tectonics. Students design and build model structures that can reduce the risks associated with earthquakes.
- **Volcanoes**—Students simulate the movement of magma and lava and its effects on land formation. They investigate viscosity and crystallization and examine igneous rocks and volcanic ash. The section concludes with an investigation of the effects of ashfall on the atmosphere and surrounding landscape.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**
- **Student Web site www.stcms.si.edu**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
- 1 Materials Set
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

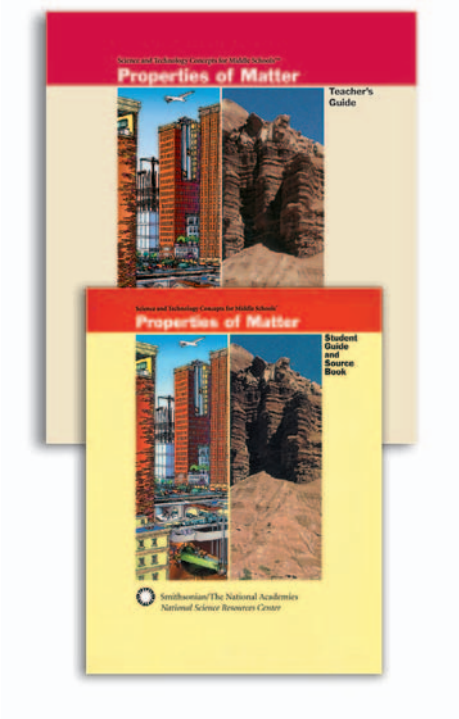
A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

High-quality professional development is essential for effective science education. It is especially valuable when it ties into the curriculum that teachers are using. The National Science Resources Center offers professional development courses tailored to its curricula: Science and Technology for Children® (STC®) for teachers of K–6 students and Science and Technology Concepts for Middle Schools™ (STC/MS™) for teachers of students in grades 6–8. For further information, check the Web site at www.nsrconline.org, contact the NSRC Professional Development Center at 202-287-7307, or send an email to nsrcpdcenter@si.edu.

GRADES 6–8

For ordering information, see page 56.



Properties of Matter

Science and Technology Concepts for Middle Schools™

In *Properties of Matter* (catalog #974406A with alcohol burner set; #974406 without burners), students in grades 6–8 study the properties of solids, liquids, and gases through a series of engaging hands-on activities. The module's 26 lessons are divided into three parts:

- **Characteristic Properties of Matter**—Students investigate the density of solids, liquids, and gases and use density to predict the behavior of solids and liquids in a density column. They construct simple thermometers and use them to investigate the effect of heat on the density of water and air. This inquiry introduces the idea of heat as an agent of change. Students continue by observing the changes that occur when they heat different substances. They then investigate phase change by graphing the temperature changes in ice water as it is heated to a boil. They also investigate conservation of mass during phase change.
- **Mixtures and Solutions**—Students begin Part 2 by discussing their ideas about pure substances and mixtures. They apply these ideas in an inquiry in which they determine whether samples are mixtures or pure substances. They then investigate solutions as an example of one type of mixture. Students also conduct inquiries using filtration, evaporation, and chromatography. They investigate changes in volume and the conservation of mass as a substance dissolves, as well as the effect of solutes on melting and boiling points.
- **Compounds, Elements, and Chemical Reactions**—In this section, students discover that water can be split into its component elements by electrolysis. Students look at elements and read the information provided on a series of element cards to classify 25 elements using their characteristic properties. They then compare these groups with their positions on the periodic table. Students look at the formation of a compound by reacting a metal and a nonmetal. The reactivity of different metals and the conservation of mass during chemical reactions are also investigated.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**
- **Student Web site www.stcms.si.edu**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

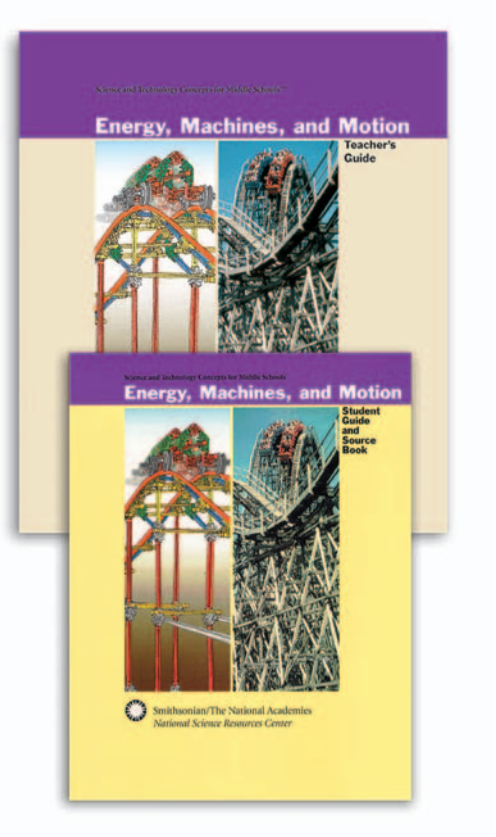
A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

High-quality professional development is essential for effective science education. It is especially valuable when it ties into the curriculum that teachers are using. The National Science Resources Center offers professional development courses tailored to its curricula: Science and Technology for Children® (STC®) for teachers of K–6 students and Science and Technology Concepts for Middle Schools™ (STC/MS™) for teachers of students in grades 6–8. For further information, check the Web site at www.nsrconline.org, contact the NSRC Professional Development Center at 202-287-7307, or send an email to nsrcpdcenter@si.edu.

GRADES 6–8

For ordering information, see page 56.



Energy, Machines, and Motion

Science and Technology Concepts for Middle Schools™

In *Energy, Machines, and Motion* (catalog #974606), students in grades 6–8 investigate force, energy, and machines at work. Use this hands-on science module to provide students with opportunities to explore both physical science and technological design concepts. The module's 22 lessons are divided into three parts:

- **Energy**—Students investigate energy transformations and how forces work to transform energy. They build a battery and develop evidence that energy is stored in the battery. Using rechargeable alkaline batteries, students see how chemical energy can be transformed into light, heat, and mechanical energy and how charging time is related to the energy stored in the battery. Students next investigate the nature of elastic forces, gravity, and sliding friction and learn how these forces can do work.
- **Machines**—Students explore the relationship between effort force and effort distance by lifting a sled using inclined planes, pulleys, and levers. They determine the mechanical advantage and efficiency of each machine. The assessment for Part II is a technological challenge in which students design a motor/machine combination that will lift their sled to a given height.
- **Motion**—Students explore the motion of three vehicles that they construct. They build a fan car, a mousetrap car, and a roller coaster and determine how the forces applied to the cars change their speed. They also describe the motion of the cars in terms of energy transformations and apply the principle of conservation of energy to explain their observations.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**
- **Student Web site www.stcms.si.edu**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
- 1 Material Set
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

High-quality professional development is essential for effective science education. It is especially valuable when it ties into the curriculum that teachers are using. The National Science Resources Center offers professional development courses tailored to its curricula: Science and Technology for Children® (STC®) for teachers of K–6 students and Science and Technology Concepts for Middle Schools™ (STC/MS™) for teachers of students in grades 6–8. For further information, check the Web site at www.nsrconline.org, contact the NSRC Professional Development Center at 202-287-7307, or send an email to nsrcpdcenter@si.edu.

GRADES 6–8

For ordering information, see page 56.

Organisms— From Macro to Micro

Science and Technology Concepts for Middle Schools™

In *Organisms—From Macro to Micro* (catalog #974806), students in grades 6–8 study the growth and development of organisms. Help students clarify what they already know about organisms and then perform a series of thought-provoking, hands-on activities that will enable them to expand on that knowledge. The module's 20 lessons are divided into three parts:

- **The Beginning**—During the first six lessons, students perform inquiry activities through which they clarify what they already know about organisms, then develop and hone laboratory and critical-thinking skills used throughout the module. They set up several module-long inquiries during which they investigate organisms at different stages of their life cycle.
- **Continuing the Cycle**—Students explore the world of cells, asexual and sexual reproduction, and several other important life processes of plants and animals. This part culminates with the introduction of the Anchor Activity (a research project), in which students work in groups during the remainder of the module to investigate the relationship between structure and function in vertebrates and share their findings with the class.
- **Completing the Cycle**—The remaining lessons offer students experiences with several interesting organisms—mold, yeast, *Daphnia,* and *Hydra*—as they design their own inquiries and gather and interpret the data. Students also prepare a graphical dichotomous key using photos and observations they have recorded about the organisms encountered during the module.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
- 1 Material Set
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

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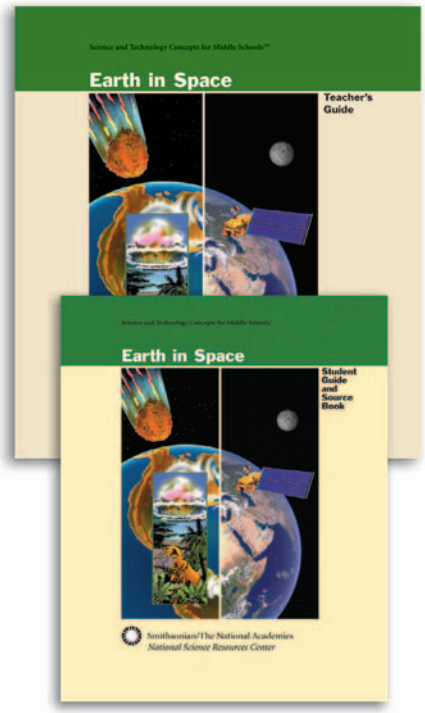
GRADES 6-8

For ordering information, see page 56.



Earth in Space

Science and Technology Concepts for Middle Schools™

In *Earth in Space* (catalog #975006), students in grades 6–8 study the solar system. Use this hands-on science module to help middle school students explore the solar system and Earth as a planet through a series of inquiry-centered activities. The module's 22 lessons are divided into three parts:

- **Sun-Earth-Moon System**—Students investigate the relative sizes, motions, and positions of the Sun, Earth, and Moon. Shadows, phases, eclipses, and seasons are used as evidence of these relationships. Students investigate the Sun as an energy source and sunspots as evidence of changes in solar energy patterns.
- **Solar System**—Students begin by considering the scale of the solar system, an exercise that helps prepare them for understanding phenomena within the system. They investigate planetary processes, such as impact cratering, wind and water erosion, landslides, volcanism, and tectonics. Students conduct investigations of gravity, orbital motion, and tides that result from gravitational forces.
- **Earth's History as a Planet**—Students compare asteroids, meteoroids, and comets and examine the effects of asteroid impact throughout Earth's history. Students explore fossils as evidence of life on Earth and its planetary changes and simulate the excavation and formation of fossils. Students compare the characteristics of Earth as a planet to those of the other planets in the solar system, and consider Earth's state of equilibrium needed to support life.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 ClassKit
- 1 Refurbishement Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

A probeware guide is also available.

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GRADES 6–8

For ordering information, see page 56.

Light

Science and Technology Concepts for Middle Schools™

In *Light* (catalog #975206), students in grades 6–8 study the characteristics of light. Introduce middle school students to the behavior, properties, and uses of light using this hands-on science module. The module's 26 lessons are divided into three parts:

- **The Nature of Light**—In these 13 lessons, students examine the sources of light, its mode of travel in straight lines, shadows, and the application of the principles of its travel in a pinhole camera. In the lessons on color they investigate the electromagnetic spectrum and its visible portion, colored light, and colored objects.
- **Reflection and Refraction**—Students investigate the reflection of light from plane and curved mirrors and the refraction of light as it passes through various media.
- **Using Light**—After investigating the images produced by lenses, students use combinations of lenses to construct simple optical devices, such as a telescope. They deconstruct a camera to examine its components and their function. The remainder of the module then focuses on visual perception of humans and animals, the structure of the human eye, and communication using light.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**

HANDS-ON MATERIALS KIT

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Each kit equips one class of 32:

- 1 Class Set
- 1 Refurbishment Set (items will be used up during instruction)
- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

A probeware guide is also available.

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GRADES 6–8

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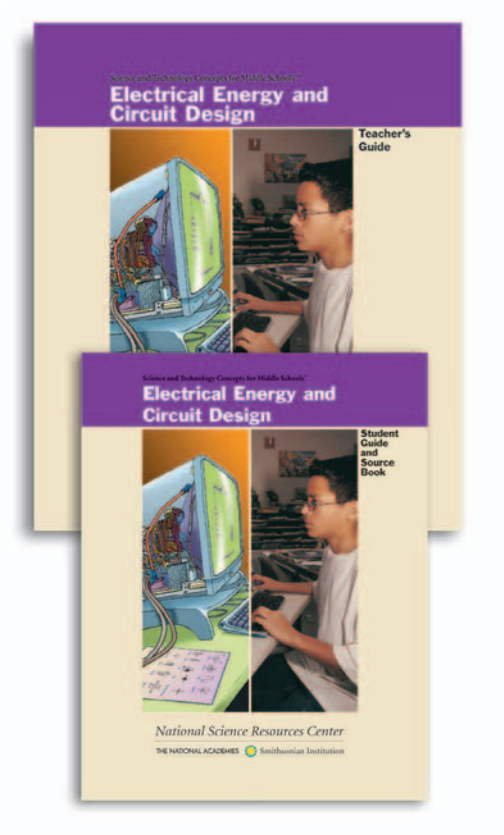

Electrical Energy and Circuit Design

Science and Technology Concepts for Middle Schools™

In *Electrical Energy and Circuit Design* (catalog #975406), students in grades 6–8 study electrical circuit systems. Through hands-on science activities, students explore the transfer of electrical energy in circuits and the design of circuits to control a variety of devices. The module's 24 lessons are divided into three parts:

- **Electrical Energy and Circuits**—Students begin by investigating static and current electricity and the transfer of energy.
- **Electrical Components in Circuits**—Students build circuits and apply what they learn about current, voltage, and power to calculate the total amount of energy an electrical device uses when it operates for a period of time.
- **Electrical Systems**—Students identify general properties of systems by focusing on familiar systems and on the use of feedback as they build control systems.

Background and supplemental information are provided by one or more reading selections in each lesson.

MODULE LENGTH

8–12 weeks of instruction

UNIT COMPONENTS

- **Teacher's Guide**
- **Student Guide and Source Book**

HANDS-ON MATERIALS KIT

Each module kit comes in one or more large, durable plastic containers with hinged, lockable lids. For a list of the materials included in the kit, visit www.carolina.com/STCMS.

Each kit equips one class of 32:

- 1 Class Kit
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- 1 Teacher's Guide
- 16 Student Guides (non-consumable)

A probeware guide is also available.

PROFESSIONAL DEVELOPMENT COURSES

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GRADES 6–8

For ordering information, see page 56.

PROFESSIONAL DEVELOPMENT CENTER

NSRC

NSRC

High-quality professional development is essential to provide a complete science education. As teachers' understanding of science and pedagogy increases, they become more able to engage young minds in the sciences. Effective science teachers are also effective learners, continually building on existing knowledge and skills. The NSRC's professional development courses provide teachers with the opportunity to learn and practice the skills needed to create supportive classroom environments for student inquiry. The NSRC offers courses that move teachers through all levels of the teaching proficiency continuum—from novice to expert.

PROFESSIONAL DEVELOPMENT FOR STC AND STC/MS USERS

Professional development is especially valuable when it ties into the curriculum that teachers are using. Courses offered through the NSRC's Professional Development Center address the National Science Education Standards and are tailored to the NSRC's curricula:

- Science and Technology for Children® (STC) for teachers of K–6 students
- Science and Technology Concepts for Middle Schools™ (STC/MS) for teachers of students in grades 6–8

See page 6 for a list of the 24 STC units and the eight STC/MS modules.

WHO SHOULD TAKE THESE COURSES?

- Existing and new users of STC and STC/MS
- District science specialists
- Teacher leaders
- Educators planning to adopt a new science curriculum

WHAT WILL THEY LEARN?

- Conceptual understanding and sequence of the science content and pedagogy needed to implement inquiry science effectively
- How to implement STC and STC/MS with their students
- How to manage the kits of materials and equipment in the classroom

HOW WILL THEY BENEFIT?

- 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
- Make conceptual connections within and across science disciplines, as well as with mathematics, technology, and other content areas

COURSE	AUDIENCE	CONTENT
STC/MS Overview and Awareness Sessions	Administrators, science content specialists, and teachers	– An overview of the philosophy and goals of the STC/MS program – A hands-on experience with typical investigations used in STC/MS modules – A general description of the content of the STC/MS modules
STC/MS 3-Day Curriculum Implementation Courses	Teachers	Prepare teachers to use an STC/MS module in their classrooms
	Teachers and teacher leaders	Prepare other education professionals to deliver the 3-day Curriculum Implementation Courses
STC Courses	Teachers	A range of professional development courses supporting the revised STC elementary curriculum to be offered early 2005
Short Courses for Users of Inquiry-Based Curricula	Teachers	One-day courses that focus on specific aspects of science instruction, such as: – Understanding inquiry science – Identifying the conceptual strands in the curricula – Reading, writing, and notebooking in the inquiry science classroom – Integrating assessment strategies – Incorporating probeware and computer use
Graduate Level Content Courses for Middle School and Elementary Life, Earth, and Physical Sciences	Teachers	Provide teachers with hands-on, inquiry experiences that help them gain a deeper understanding of the concepts in the modules. The NSRC works in partnership with academic institutions to develop and offer content courses contextualized to standards-based, inquiry science curricula. Available 2005.

NEW—SMITHSONIAN SUMMER ACADEMY FOR SCIENCE TEACHERS

The NSRC has just announced a week-long summer academy for science teachers. For July 2005, the initial Smithsonian Science Education Academy for Teachers will focus on physical science. In future years, the Academies will also address the life and earth sciences.

The Academy is based on physical science concepts for grades 5–8 in the National Science Education Standards. It will integrate 3-1/2 hours of intensive pedagogic and science content training each morning and related "behind the scenes" interactions with Smithsonian scientists and curators each afternoon.

Teachers who participate in the Academy will:

- Develop pedagogical approaches that promote hands-on, inquiry science teaching
- Develop broader and deeper understanding of content associated with science concepts typically addressed in middle school
- Learn how to use high-quality, NSF-sponsored curriculum materials in a classroom setting
- Become acquainted with Smithsonian scientists and science resources

Schedule a Course at Your Site or Enroll in the Summer Academy

We welcome the opportunity to customize our services to suit the unique needs of districts and coalitions. This includes letting you choose the most convenient site location.

For further information on the NSRC's professional development courses, including the Smithsonian Science Education Academy for Teachers, contact the NSRC Professional Development Center at 202-287-7307. You may also contact us via email: nsrcpdcenter@si.edu.

The LASER Center — Outreach to School Districts

NSRC

NSRC

Over its 20-year lifetime, the National Science Resources Center has built an outreach program to help reform-minded education leaders develop a vision of effective science learning and teaching.

This program is led by the NSRC's *Leadership and Assistance for Science Education Reform (LASER)* Center. The LASER Center was established in 1998 with support from the National Science Foundation to leverage a decade of NSRC experience in working with school districts in reforming their K–8 science education programs. More than 750 school districts have participated in LASER Center strategic planning institutes, ongoing programs, and networking opportunities. These services provide local leaders with access to national expertise, tools, and resources that help them improve the quality of science for their children.

In a partnership with the NSRC and the LASER Center, school districts work toward:

- Developing a science-literate student population
- Moving teachers toward science teaching expertise
- Increasing student achievement in science.

Over the years, the NSRC has worked with more than 750 school districts to plan for the transition from traditional, textbook-based science programs to exemplary, inquiry-based science learning and teaching.

Building Success with Partners: The LASER Network

As school districts and regions mature, grow, and change, their needs and areas of expertise also change. The staffs at the NSRC and LASER Center provide the foundation and resources for ongoing learning about and systematizing lasting reform in schools. In addition to this foundation, the NSRC also provides networking opportunities through the *LASER Network*. This national and international network is an invaluable asset to education leaders as they navigate the road from chaos to alignment, from challenges to successes, and from desperation to inspiration. It is through this network that the NSRC and LASER Center have come to understand best practice in system reform.

Stages of Reform

A district or region goes through four stages on its path toward increasing student achievement in science. Although these stages are at the LASER Center's heart, we recognize that many districts or regions are at different stages of the process and have needs unique to their system, school district, and community. The LASER Center strives to meet a district or region where it is in this process and to help it tailor a reform plan that will meet its needs.

STAGE 1: Building Awareness for Reform

During this stage, the NSRC and its regional partners hold events that provide local and regional education leaders with an introduction to effective K–8 science learning and teaching. These events are designed for key stakeholders and leaders who have a vested interest in improving science education. *Building Awareness Events* establish a shared vision for reform and assess (1) the community's understanding of what needs to happen to improve science achievement; and (2) its ability to engage key decisionmakers in moving forward with this process. This sets the stage for a local planning committee to work with the NSRC to identify financial, academic, governmental, and institutional supporters.

STAGE 2: Selecting Regional Reform Leaders and Initiating Reform Regional Leaders

The momentum generated by building awareness for reform leads to planning for change. Part of the strategy for moving forward is to secure two or three regional leaders who can help launch and sustain the reform effort. These people (ideally a team) are skilled, visionary education administrators, business leaders, and practitioners who are experienced in taking risks. Their primary role is to build an infrastructure that will sustain the science reform effort and to identify the human, financial, and material resources that will support that infrastructure. The next steps are to create a plan for the reform effort, and to train and cultivate regional representatives to carry out that plan. The capstone mechanism for introducing a reform model into schools is the LASER Center's *Strategic Planning Institute*. The institute brings together leadership teams from communities across the country and globe to one location and immerses them in a weeklong professional program that identifies the programs, processes, and resources needed to establish an effective environment for science education reform.

STAGE 3: Building Leadership Capacity

A key component of sustainability is the existence of committed and talented leadership onsite to support, cultivate, and direct educators and community leaders going through the transition from initiation to implementation. The LASER Center provides ongoing technical support, expertise, and training for the emerging leaders throughout the entire change process. Regardless of where these individuals and their systems are along the continuum of change, leaders can access critical resources and expertise through the NSRC or the regional support structure.

STAGE 4: Implementing and Sustaining Reform

As school districts and regions arrive at years three and four of their strategic plans, they assess the changes and differences in their district and region. In this stage, the LASER Center provides programs, resources, and events that address specific areas of need.

Do you want to build a truly effective science education program for your children? Are you ready to take the first step—or the next step—toward that goal? Contact the LASER Center for more information:

The LASER Center
National Science Resources Center
901 D Street, SW, Suite 704B
Washington, DC 20024

monkm@si.edu
202-287-7312
202-287-2070 fax

Curriculum Development Center

Research-based curriculum is a critical component of an effective science program. The National Science Resources Center's Curriculum Development Center researches, develops, and publishes inquiry-centered science education curricula that can be used by school districts to construct core instructional programs.

The NSRC has developed two comprehensive science curriculum programs for K–8 students: the elementary program, Science and Technology for Children® (STC), designed for students grades K–6; and the middle school program, Science and Technology Concepts for Middle Schools™ (STC/MS), designed for students in grades 6–8.

ELEMENTARY SCIENCE CURRICULUM

- **Science and Technology for Children (STC)**
  Designed to achieve scientific literacy by providing children with opportunities to learn age-appropriate concepts and skills and acquire scientific attitudes and habits of mind in the life, earth, and physical sciences and technology, STC is an innovative, comprehensive 24-unit K–6 curriculum. Field-tested in school districts nationwide, the curriculum is being used in thousands of elementary school classrooms throughout the United States. Student notebooks for the curriculum are available in Spanish.
- **Science and Technology for Children BOOKS™**
  Developed to add a literacy component to the STC curriculum, each book is designed to be used in conjunction with teaching science or as a stand-alone that conveys topics in a way that makes science interesting and relevant. In addition, the series provides a unique means of highlighting the work being done by the scientists at the Smithsonian Institution. Books for grades 4–6 are currently available. Books for 3rd grade and middle school are currently under development. Each book has an accompanying Teacher's Guide.
- ***STC Meets the Standards***
  This publication presents a detailed explanation of how STC correlates with the National Science Education Standards.
- **STC Teacher Instructional Videos**
  Our publisher, Carolina Biological Supply Company, worked in collaboration with specialists in the field to create the videos that accompany all STC units. In each tape, a master STC teacher demonstrates how to set up and use the materials.
- ***Resources for Teaching Elementary School Science***
  This annotated guide provides teachers, curriculum specialists, teacher trainers, and parents with information on science curricula, museum science programs, and other science resources at the K–6 level.

MIDDLE SCHOOL SCIENCE CURRICULUM

- **Science and Technology Concepts for Middle Schools (STC/MS)**
  Designed for students in grades 6–8, STC/MS is a comprehensive middle school science curriculum that builds concepts in the STC units.
- ***Guide to Probeware and Computer Applications for STC/MS***
  A supplement to the STC/MS curriculum, this guide contains probeware and computer technology applications that allow students to use more sensitive equipment during lab experiments. These applications may replace or enhance labs in individual STC/MS modules.
- ***Resources for Teaching Middle School Science***
  This annotated guide provides teachers, curriculum specialists, teacher trainers, and parents with information on science curricula, museum science programs, and other science resources at the 6–8 level.

International Activities

The NSRC has been active in international science education efforts for a number of years, through participation in international conferences and support for individual countries' reform efforts. The NSRC's investments in other countries' science education programs are far more than philanthropic gestures; every penny that we have invested in science education reform efforts abroad has been returned many times over in insights gained. Following are examples of recent NSRC activities abroad.

SWEDEN USES NSRC MODEL TO IMPROVE ELEMENTARY SCIENCE EDUCATION

Sweden's *Naturvetenskap och Teknik för Alla (NTA)*—Science and Technology for All—program, based on curriculum and dissemination models developed by the NSRC, has moved beyond its modest beginnings to gain a strong foothold in that Scandinavian country in less than a decade. An early task was translation of the NSRC's Science and Technology for Children® units into Swedish.

Forty-one of Sweden's 200-plus municipalities now participate in the program, with a goal of 100 participating municipalities by 2008. More than 40,000 K–6 students and more than 2,000 teachers use the program. Students exposed to the *NTA* curriculum show an increased eagerness to learn physics, chemistry, biology, and technology. Teachers develop increased competence and self-confidence.

ADOPTION OF THE STC CURRICULUM AIDS CHILEAN SCIENCE EDUCATION EFFORTS

The Chilean Academy of Sciences, the Ministry of Education, and the Faculty of Medicine of the University of Chile have inaugurated a program that they call "Inquiry Based Science Education for Children of Elementary Schools." The program was begun in 2003 in six schools and expanded in 2004 to 24 schools, all in the Santiago area. It covers 5,000 students and 120 teachers. The program uses seven units of the STC curriculum, training of teachers in inquiry instructional methodologies, school-based science materials refurbishment centers, support from both school administration and the community, and continuous assessment. Assessments of the program note positive changes in the classroom among both students and teachers.

NAMIBIA CONSIDERS ADOPTING STC/MS FOR ITS SCIENCE EDUCATION PROGRAM

NSRC Professional Development Center co-director David Marsland spent two weeks in the southwestern African nation of Namibia in early 2004 working with Namibian science educators to evaluate the possible use of inquiry kit-based materials as part of their national curriculum. The visit is to be followed up by a project involving cooperation between the Namibian Government, the U.S. Peace Corps, and the NSRC in the development of inquiry materials and professional development appropriate to the Namibian context.

CHINESE LEADERS RECEPTIVE TO SCIENCE EDUCATION REFORM

In a visit to China in spring 2004, NSRC executive director Sally Goetz Shuler briefed Chinese education leaders on the NSRC reform model. She found not only a receptive effort for her presentation but also a nation committed to bridging the economic gap between their country and the richest nations of the West, using education—and especially science education—as the fulcrum for that effort.

INTERNATIONAL EDUCATIONAL CONFERENCES

The NSRC is helping plan major international science education conferences to be held during 2005 in Mexico and Italy.

GIVING OPPORTUNITIES

THE NEED:

The NSRC's work would not be possible without the generous support of corporations and foundations that are committed to supporting science education and thereby providing a better future for our children. They know that today's child is tomorrow's employee and citizen. Whether the student grows up to be a biochemist or an auto mechanic, science and mathematics knowledge and skills will be critical to that employee's success and our country's future. At the same time, government funding of inquiry-based science education programs has been declining.

HOW YOU CAN HELP:

Corporations can help the NSRC accomplish its mission of improving the teaching and learning of science in the following ways:

- Work with the NSRC to provide professional development courses for teachers in your school district.
- Sponsor a teacher or group of teachers to attend the Smithsonian Summer Science Education Academy for Teachers in Washington, D.C.
- Support the development of new research-based curriculum products for elementary, middle school, or high school students.
- Provide for the development and production of new science literacy projects.
- Contribute funding for updating current curricula, thereby keeping them up-to-date and relevant to students.
- Make possible the development of Web-based versions of STC and STC/MS curricula for students, teachers, and parents.
- Fund a Strategic Planning Institute in your region.
- Purchase the Science and Technology for Children® or Science and Technology Concepts for Middle Schools™ hands-on science curricula for your school system or for a rural or disadvantaged school district.
- Provide the students in your district with a literacy component to science through the Science and Technology for Children BOOKS™.

SPECIAL THANKS

The NSRC gratefully acknowledges the support it receives from the Smithsonian Institution and the National Academies for operations and program activities. We also extend deep appreciation to the National Science Foundation and the numerous private foundations and corporations that have provided generous support for program activities since their establishment.

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HOW TO GIVE

If you would like to find out more about how your corporation or foundation can become involved in supporting the NSRC—and by extension, school districts and students nationwide—please contact Stacy Armstrong at armstrongs@si.edu.

Sales Information

CAROLINA BIOLOGICAL SUPPLY COMPANY

To order K–8 curriculum kits and their corresponding Teacher's Guides, Student Guides, and STC BOOKS™, please contact Carolina at:

Order by Phone: 800-334-5551 (8 a.m. to 8 p.m., ET, M–F)

Order by Fax: 800-222-7112 (24 hours a day, 7 days a week)

Order on the Web: www.carolina.com

If you have questions on any of the STC® or STC/MS™ products, or need help selecting or using materials for specific applications, please call:

Get Help by Phone: 800-227-1150 (8 a.m. to 5 p.m., ET, M-F)

Get Help by E-mail: carolina@carolina.com

NATIONAL ACADEMIES PRESS

STC BOOKS for grades 4–6 (see curriculum chart on page 6 for available titles) are available individually, or grouped as a classroom set of eight of the same title, as a science library set of all 12 titles, as a Life and Earth Science Library set of six books, or as a Physical Science and Technology library set of six books. To order the STC BOOKS and their corresponding Teacher's Guides, please contact the National Academies Press at:

Order by Phone: 888-624-7654 or 202-334-3313

Order on the Web: www.nap.edu

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BY SUBJECT

LIFE AND EARTH SCIENCE

PHYSICAL SCIENCE AND TECHNOLOGY

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