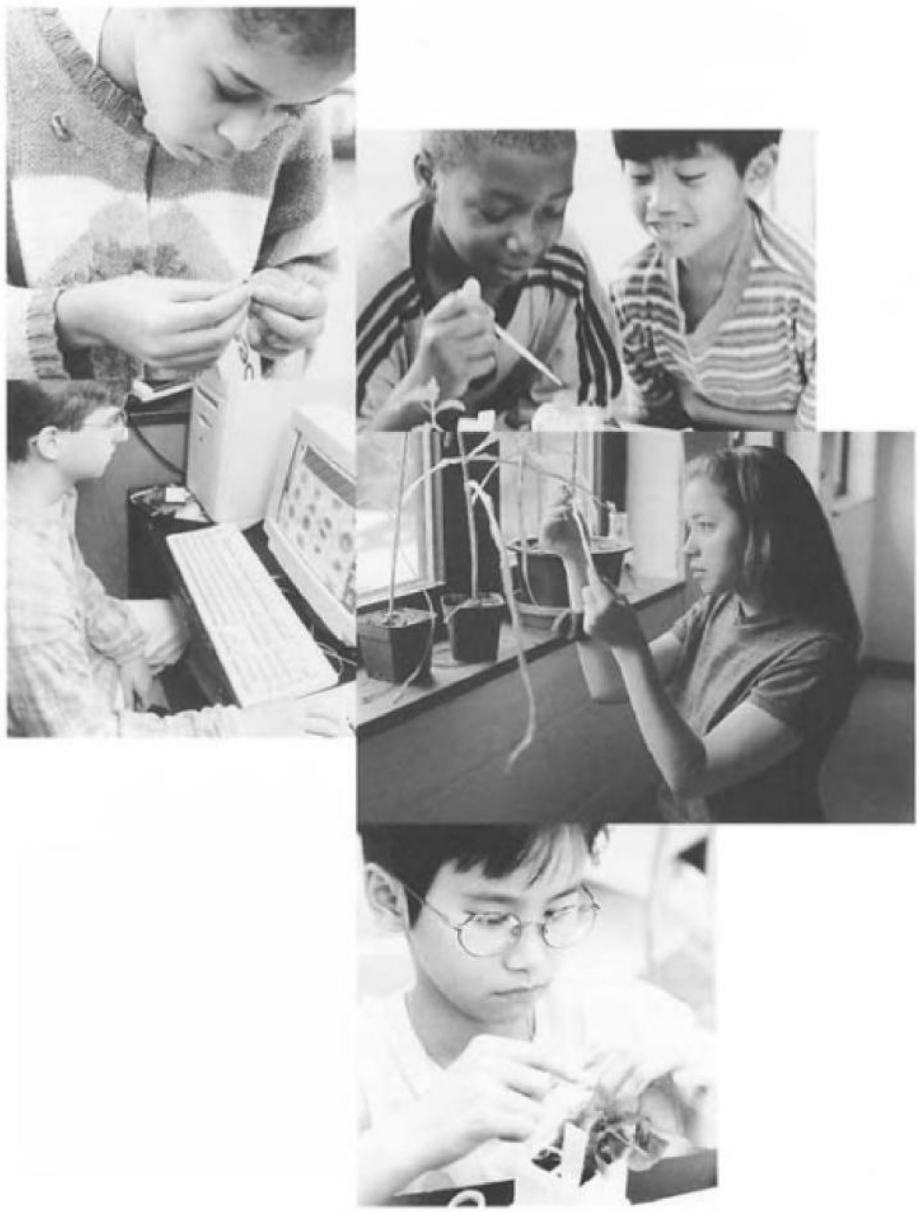
Every Child a Scientist

Achieving Scientific Literacy for All



How to Use the *National Science Education Standards* to Improve Your Child's School Science Program

NATIONAL ACADEMY PRESS
Washington, DC 1998

Contents

Introduction

The astronomer Carl Sagan once said, "Everybody starts out as a scientist. Every child has the scientist's sense of wonder and awe." Sustaining this sense of wonder presents teachers, parents, and others close to children with a tremendous responsibility—and an extraordinary opportunity.

Parents and other adults can improve the quality of education in many different ways. This booklet is for those who want to take an active role in improving the science program in their schools. The *National Science Education Standards,* published in 1996 by the National Research Council, can be an important guide in realizing this goal. The *Standards* call for a kind of science education that is rare in science classrooms. While focusing on key scientific concepts, the *Standards* also stress the importance of how students learn. Students need to be able to ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others. Students' learning needs to be assessed in ways that further their mastery of science. All students need supportive educational programs and systems that nurture achievement.

The first section of this booklet argues that science should be a part of all students' education. The second section provides a vision of the curriculum and teaching in a classroom where students can gain the understanding of science and technology that they

In a rapidly changing, increasingly technological world, all students need to understand science and technology. Teachers and administrators increasingly need parents and other members of the community to become partners in making sure our children know what they need to know.

need in today's society. Sections three and four outline how the *Standards* can help improve the quality of the science being taught and how it is assessed. The last section suggests what you can do to become a partner in improving science teaching and learning in your school.

As you read this booklet, consider what you can do to boost the quality of science education in your community. You might be able to raise this matter with your local parent-teacher association, talk to your child's science teacher, or become involved in establishing school policy at the district level. Your commitment—and help—are key. Your input can help make the difference between a mediocre science program and a world-class science education.

In a rapidly changing, increasingly technological world, all students need to understand science and technology. Teachers and administrators increasingly need parents and other members of the community to become partners in making sure our children know what they need to know.

Why Do We Need Science, Anyway?

Laser surgery . . . life in a meteorite from Mars . . . cable television . . . the Internet . . . gene therapy . . . faxes . . . . These are signs of our times, markers of the late 20th century's scientific and technological revolution. Science and technology have changed the way we work, communicate, and view the world.

As adults, we can remember a time—not so very long ago—when our homes and businesses were quite different. In the late 1960s, answering machines and VCRs were not commercially available. Now they are commonplace. In the 1980s, offices were beginning to use computers. Today, not only do most office workers have their own "PC," but many computers are part of an extensive network—the Internet—that can bring information, photographs, and moving images to individuals at work and at home.

TECHNOLOGY HAS CHANGED OUR LIVES

Computer technology also has revolutionized industry. Automobile manufacturing plants rely increasingly on automated systems to do the job hundreds of workers used to do. The workforce in such plants must have a radically different set of skills than did their predecessors.

Agriculture has been influenced by scientific advances as well. Through genetic engineering, farmers and scientists are working together to develop more productive, heartier, and disease-resistant crops.

These days, it is difficult to think of a job that does not require some expertise in technology. Take your neighborhood school. Right now, your school's cafeteria workers may be using e-mail to send the