



INTERNATIONAL
TECHNOLOGY
EDUCATION
ASSOCIATION

Standards for Technology Education

Technological Literacy

Technological literacy is the ability to use, manage, and understand technology. It involves a vision where each citizen has a degree of knowledge about the nature, behavior, power, and consequence of technology from a broad perspective. Inherently, it involves educational programs where learners become engaged in critical thinking as they design and develop products, systems, and environments to solve practical problems. Technologically literate persons understand that the solution to one problem may cause another problem, and they appreciate the interrelationships between technology and individuals, society, and the environment. They understand and appreciate the importance of fundamental technological developments, combine ingenuity and resources to meet human needs and wants, and use and understand a variety of classification systems.

Why Do We Need Standards?

As stated by the National Academy of Sciences, “To be prepared for today’s workforce, informed about important issues, and able to understand the complex world in which we live, all Americans must have a solid education in science, mathematics, and *technology*.”

Standards provide a structured framework for everyone involved in

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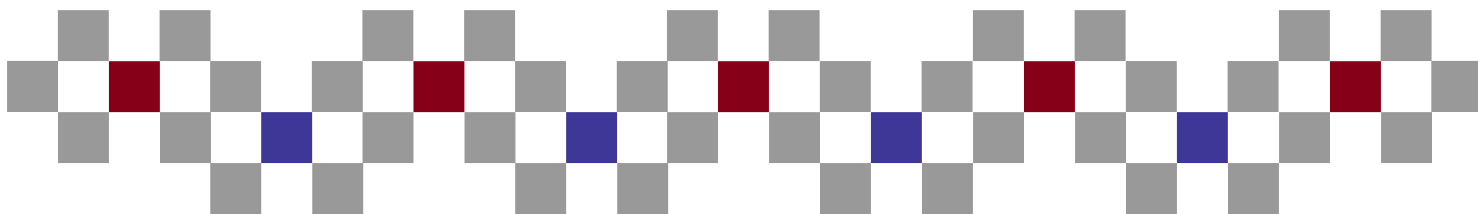
- Consistency in teaching and learning
- A foundation for what every child should know and be able to do
- Coherency in educational programs

education. They establish guidelines for teaching and resolve what every child should know and be able to do before they graduate. Standards are valuable to school administrators, teachers, parents, students, and everyone interested in ensuring that our children are receiving a quality education that will transfer to other avenues of society.

The Technology Education Standards

When the standards for technology education are released next year, they will provide a means to enhance the common core of learning for all students in a form that every teacher can implement. They will be developmentally appropriate for each student in grades K-12, and will establish qualitative and quantitative expectations of achievement for all students. Standards promote lifelong learning, maturation, and career enhancement opportunities in technologically-oriented professions, such as engineering, computer science, biotechnology, and architecture. They are not a federal policy or mandate, nor are they a curriculum that describes how and when the content prescribed in the standards should be delivered. Standards are voluntary – the decision to use them resides at the state and local level.





The Vision of the Standards

Creating standards for technology education is a vision inspired by the desire to promote excellence within the field. The initial process entails defining the domain of technology, promoting the study of technology, and creating standards.

There are four guiding principles behind the standards for technology: 1) technology is for all students; 2) learning technology is an active process involving a knowledge foundation; 3) technological studies reflect the history and nature of technology; and 4) improving the study of technology is part of a systemwide educational reform. These principles are being used to develop standards for students at grade levels K-2, 3-5, 6-8, and 9-12.



The *Technology for All Americans Project* is a project of the International Technology Education Association (ITEA). Funding is provided by the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA).

All inquiries should be addressed to:

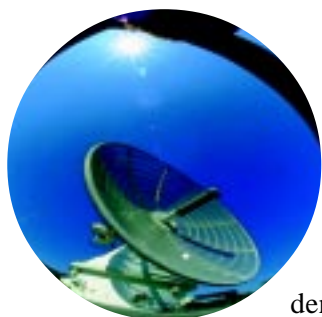
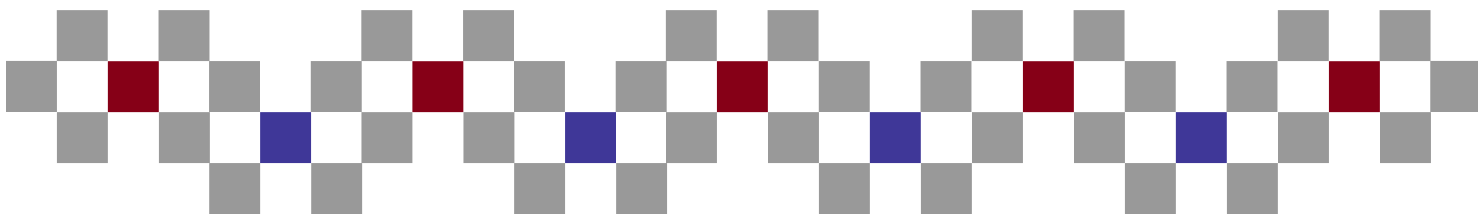
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Creating the Standards

In 1996, the International Technology Education Association's Technology for All Americans Project (TfAAP) began working on the development of standards. After developing a rationale and structure for the study of technology, TfAAP focused on creating *Standards for Technology Education: Content for the Study of Technology (Technology Content Standards)*.

Three drafts of *Technology Content Standards* have been developed. The drafts were reviewed by thousands of people through a mail-out review process, hearings, an electronic review using the Internet, and a nationwide field review in 64 schools. The results of the reviews and input on the drafts have been and will continue to be incorporated into each future draft so that each version is progressively enhanced. *Technology Content Standards* will be published in 2000.



Technology Education Standards: Now and for the Future

Historically, technology education has been an assortment of learning concepts that varied from program to program. Students were not uniformly being taught the same principles. Today's technology education programs are working to provide common learning environments for all students engaged in the study of technology.

Standards are the key to creating commonality in technology education. They will serve as the organizer that will unify programs across the country. *Technology Content Standards* will influence other technology standards that have been created by states and localities. Although, each school's curriculum may be different, students in technology education programs in the United States will have the advantage of gaining the same fundamental knowledge as their counterparts.

Language makes us human.
Literacy makes us civilized.
The arts add enlightenment
and enduring resources for
thoughtfulness.
Science and technology makes
us powerful and being in
community with others can
make us free.

Mary Hamm and Dennis Adams,
*Literacy in Science, Technology, and
the Language Arts*, 1998.

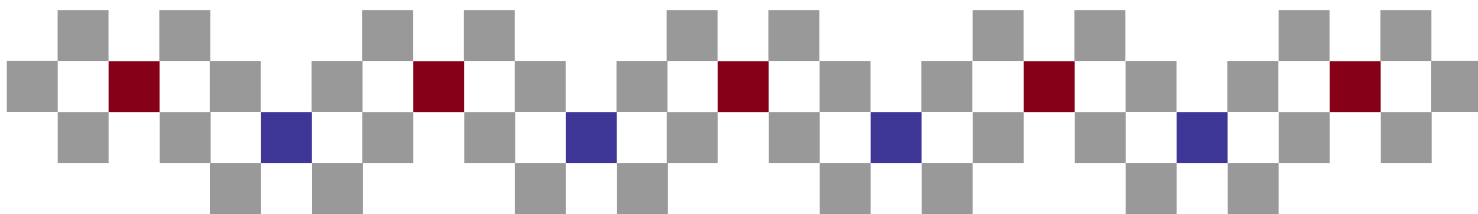
What needs to be done?

Curricula will have to be developed around the content of the standards. In order to unify the study of technology, technology education programs must be built upon the same foundation. A means of evaluating technological literacy based on *Technology Content Standards* will need to be developed and utilized. Teacher education programs will have to design new preservice teacher preparation programs that reflect the standards. Existing teachers will need to receive proper inservice in order to use *Technology Content Standards* successfully. Vendors, educational publishers, equipment manufacturers, and modular program developers must create new educational material that is based on *Technology Content Standards*.

With the success of the standards initiative, technology education will have a closer relationship with core subjects such as science, mathematics, language arts, and social studies. The new standards also could create a stronger relationship with engineering.

Technology education will emerge into a new position in the future—one as important and basic as English or science. The key to attaining this position is developing the best possible standards for technology education. The standards also will directly affect the quality of the programs and teachers that are in the schools. Strong teachers will build strong technology education programs. The success of the standards for technology education holds the promise of a technologically literate society.

The world is rapidly changing. We have the knowledge and abilities necessary to understand and appreciate the many advances being made. Technology education standards will guide us to the level of technological literacy needed to decide how we want to live with this change.



Technology Education in the Schools

The first priority of technology education is to provide technological literacy for all students. Technology must be a required subject for all students at every level of education. Incorporating technology education into school programs will require curriculum development and teacher training.

In the elementary years, technology education should be designed to help students learn and achieve the educational goals of the total elementary curriculum. Beginning in kindergarten, technology education can provide the kind of active learning that children need and enjoy. These experiences develop the students' perceptions and knowledge of technology, psychomotor skills, and provide a basis for informed attitudes about the interrelationships of technology, society, and the environment.

Middle school technology education programs should be designed to provide active learning situations that help the early adolescent explore a broader view of technology. Students can be given opportunities to see how technology has contextual relationships with other fields of study, such as science, mathematics, social studies, language arts, and the humanities and with society and the environment. Taking technology education courses at this level will help students discover and develop personal interests, talents, and abilities related to technology.

High school students can better appreciate the interrelationships between technology and other school subjects. Their needs are more diverse since their interests and potential career choices are ex-

panding. After graduation, some students who study technology will pursue careers in technology teacher education, engineering, architecture, computer science, and engineering technology. Ultimately, regardless of the path they choose, every student should be technologically literate before graduating from high school.



What Teachers Need to Know

Teachers face challenges for improving student achievement, developing technological literacy, and implementing curricula to meet content standards. TfAAP will conduct workshops in the summer of 2000 to assist technology education teachers with the implementation of the standards.

ITEA also has established the consortium-based Center to Advance the Teaching of Technology & Science (CATTS) to help teachers meet these challenges. The Center's mission is to provide consortium members with professional development support in the form of curriculum resources, teacher training, and research. CATTS will help elementary and secondary teachers as they strive to provide direct research- and standards-based curriculum support to enhance the teaching of technology and science in school classrooms.

Consortium members will find CATTS a valuable professional resource for developing relevant classroom instruction, locating quality standards-based curriculum resources, and promoting technological literacy through exciting student experiences.

More information about CATTS is online at <http://www.itea.org>, or you may email cattsitea@iris.org.