

## Teaching Technology

Each school system needs to establish effective technological literacy efforts beginning in kindergarten and continuing each year through high school. By using the structure outlined in the document, communities can incorporate the necessary concepts and experiences so all students have the opportunity to develop the necessary knowledge and abilities. By incorporating the universals of technology throughout the curriculum and in technology courses, schools can provide experiences that instill insight and problem-solving capabilities. Technology should be a required subject for every student at every level. This vision necessitates curriculum development, teacher enhancement, and in some cases, restructuring building space. However, it is an effort that will reap rewards for every community in the country. The study of technology during the elementary, middle, and high school years and beyond should become a national priority.

## Taking Action

To help achieve technological literacy, standards for technology education must be developed based on the universals and structure described in this document.

ITEA and the Technology for All Americans Project provide the support, knowledge-base, and opportunity for groups, agencies, and associations to become involved in the promotion of technology education as an essential core subject in our nation's schools.

\* \* \*

*ITEA is the largest professional educational association, principle voice, and information clearinghouse in the world devoted to enhancing technology education through experiences in schools (K-12).*

## ITEA's Mission

- Provide a foundation for the study of technology that emphasizes technological literacy
- Provide teaching and learning systems for developing technological literacy
- Foster research to advance the field
- Establish technology education as a primary discipline
- Increase the number and quality of technology teachers

Copies of *Technology for All Americans: A Rationale and Structure for the Study of Technology* may be purchased for \$10.00 for members and \$15.00 for nonmembers plus postage and handling from:



**INTERNATIONAL  
TECHNOLOGY  
EDUCATION  
ASSOCIATION**

International Technology Education Association  
1914 Association Drive, Suite 201  
Reston, VA 20191-1539  
Phone: (703) 860-2100  
Fax: (703) 860-0353  
Email: [iteapubs@iris.org](mailto:iteapubs@iris.org)  
URL: <http://www.iteawww.org>



**INTERNATIONAL  
TECHNOLOGY  
EDUCATION  
ASSOCIATION**

## ***Technology for All Americans: A Rationale and Structure for the Study of Technology***

## **Executive Summary**

Prepared by

International Technology Education Association  
Technology for All Americans Project  
1997 S. Main Street, Suite 701  
Blacksburg, VA 24060  
Phone: (540) 953-0203  
Fax: (540) 953-0014  
Email: [standards@itea-tfaap.org](mailto:standards@itea-tfaap.org)  
URL: <http://scholar.lib.vt.edu/TAA/TAA.html>

# ***Technology for All Americans: A Rationale and Structure for the Study of Technology***

## **Executive Summary**

Many associations and agencies, including the International Technology Education Association (ITEA), have called for a continuous technology education program for grades K-12. As envisioned by all of these groups, technology education is a dynamic problem-solving and design-based program that enables students to gain hands-on participatory experiences that demonstrate technology's infrastructure and scientific principles and an understanding about how things work.

What does every student need to know about and be able to do with technology? How should the articulated program in technology from grades K-12 be organized? Is there a structure for teaching technology that can withstand the accelerating changes in our technological environment? These issues were the driving force behind the creation of the Technology for All Americans Project.

ITEA's Technology for All Americans Project was funded by the National Science Foundation and the National Aeronautics and Space Administration to answer those critical issues for technology education. The project developed a document targeted for technology educators, policy makers, and all those concerned with technological literacy entitled *Technology for All Americans: A Rationale and Structure for the Study of Technology*. This document provides a new vision for the study of technology.

There are a number of definitions for the concept of technology. The concept is complex and used in a variety of different contexts; nonetheless, a working

definition was necessary to convey the desired meaning of technology. The project defined technology as human innovation in action. It involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities.

This document discusses the power and the promise of technology and the need for technological literacy. Universals for the study of technology are presented. The document also describes how technology should be integrated into the core of the curriculum from kindergarten through high school and beyond. Finally, a challenge is made to all concerned to take action to establish technology education standards and make technological literacy an educational priority.

### **The Power and the Promise of Technology**

Technology is a fundamental aspect of human activity. The acceleration of technological change is a constant in everyone's life. The power and the promise of technology is based on the need for technological literacy—the ability to use, manage, and understand technology. Technological literacy is considered to be critical to the success of individuals, entire societies, and to the Earth's ecological balance. The promise of the future lies not in technology alone, but in people's ability to use, manage, and understand it.

### **A Structure for the Study of Technology**

Agreement on the need for technological literacy is just the beginning. The more difficult problem is determining how to develop this literacy. What experiences, abilities, and knowledge are needed? What exactly should a person know about and be able to do with technology? What should the content of

this literacy effort be? The specific answers change with a person's location, as well as individual aspirations, career, and capabilities. In addition, the answers change rapidly with time.

The structure developed for the study of technology focuses on *universals* of technology that are considered to be significant and timeless, even in an era dominated by uncertainties and accelerated change. As the definition indicates, there is a knowledge and process base for technology that is quantifiable and timeless. Technological knowledge includes the nature and evolution of technology, linkages, and technological concepts and principles.

The processes are those actions that people undertake to create, invent, design, transform, produce, make, control, maintain, and use systems. They include designing and developing technological systems; determining and controlling their behavior; utilizing them; and assessing the impacts and consequences. Both the knowledge and processes are critical to the existence and advancement of technology. One cannot exist without the other, for they are mutually dependent. With technological knowledge people engage in the processes, yet it is through the processes that technological knowledge is developed.

People develop technological knowledge and processes in order to develop and use systems that solve problems and extend their capabilities. Invariably, this involves physical, biological/chemical, or informational systems to change the natural world. In other words, people develop technological processes and knowledge within the context of adaptive systems, which are the means that people use to modify nature.

Knowledge, processes, and contexts, then, have been identified in this document as the universals of technology, and are considered the foundation of the structure for the study of technology. Each of the universals is discussed in detail within the document.

*Technological literacy is the  
ability to use, manage, and  
understand technology.*

*Technology is human  
innovation in action.*