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ABSTRACT

This guide, which is designed for use by Maryland technology education (TE) teachers, content supervisors, and school improvement teams, outlines a review process to align TE programs across Maryland with the goals established by the state's board of education. First, the guide's purpose is stated, and the following steps of the TE assessment process are reviewed: planning the assessment, conducting the assessment, reporting the assessment findings, and overcoming the weaknesses identified during the assessment. The remainder of the guide presents Maryland's TE quality indicators, which are organized into sections devoted to the following aspects of TE: philosophy; population served; instructional program (instruction/curriculum in grades K-5, 6-8, 9-10, and 11-12; TE teaching/learning strategies); advisory committees; facilities, equipment, and materials; administration and supervision; and instructional staff. The quality indicators pertaining to TE teaching/learning strategies are further subdivided into sections devoted to the following: topic investigations, modular technology activity, product generation, research and experimentation, and engineering design/development. Each section includes a brief discussion of the specific aspect of TE being assessed and proceeds to list the standards and criteria for standards that are being met. Checklists of quality indicators pertaining to each criterion are also provided. Appended are assessment forms and a glossary. (MN)

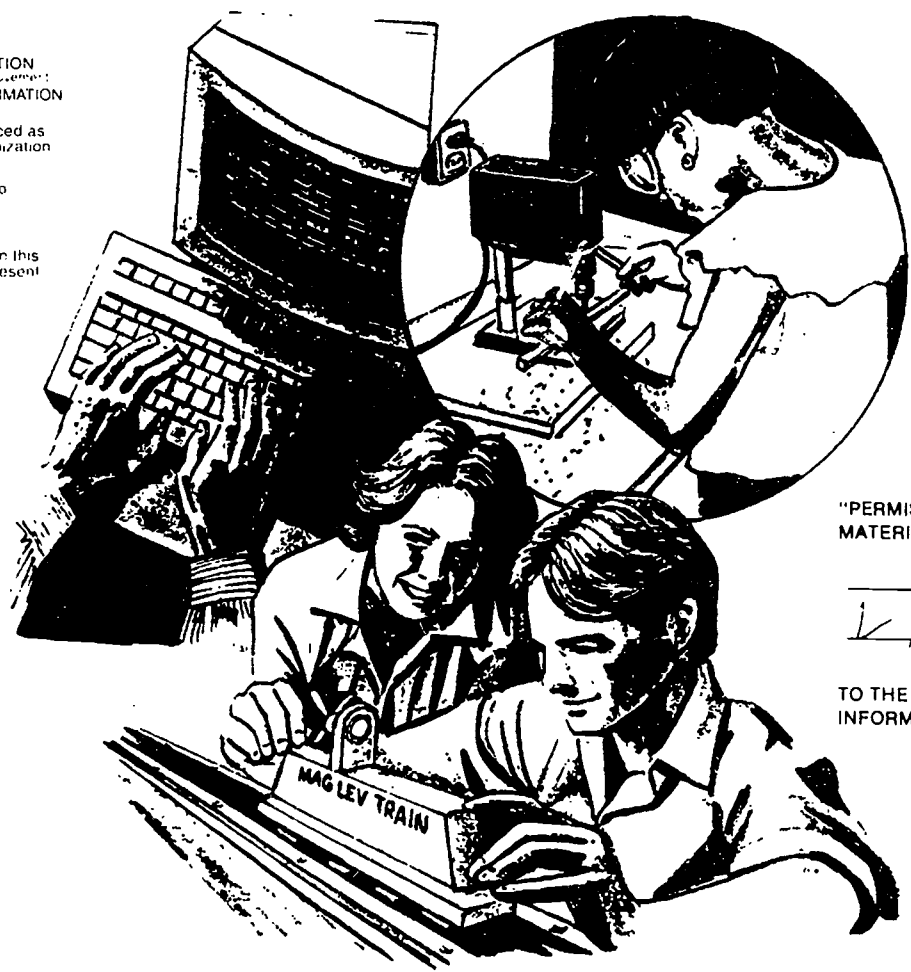
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ED 386 600

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

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FOREWORD

The Maryland State Department of Education recognizes the importance of aligning technology education programs with the goals established by the State Board of Education. To ensure that programs are integral to this thrust, quality criteria must exist to measure progress in achieving excellence in technology education programs.

The State of Maryland has taken the lead, nationally, in addressing the issue of technological literacy. Through the establishment of high school graduation requirements in technology education, we are committed to providing educational experiences that will enable students:

- to interact successfully with technology,
- to assess the impact of technology on everyday life and make appropriate decisions, and
- to apply conceptual knowledge to solve problems.

Program assessment is critical to the maintenance of quality technology education programming. The *Quality Indicators for Technology Education Programs in Maryland* are aimed at accomplishing this task. They provide information for making decisions designed to increase student learning.

PURPOSE

Quality Indicators for Technology Education Programs in Maryland is designed for use by teachers, content supervisors, and school improvement teams to review technology education programs. This document is a companion piece to *Technology Education: A Maryland Curricular Framework* which contains the student-centered outcomes for technology education. It should be noted that use of the *Quality Indicators for Technology Education Programs in Maryland* is voluntary; there is no state mandate requiring their use.

The use of indicators to improve technology education program quality will have an impact on the school and community. School improvement teams, content supervisors, and individual teachers will find the quality indicators useful as targets for program improvement. The review process presented here fosters open communication between the school, the public, and business and industry. *Quality Indicators for Technology Education Programs in Maryland* is an authoritative and contemporary resource for improving instruction.

User's Guide for the Quality Indicators

Each school should have a systematic, continuous evaluation process which uses accepted standards to assess all elements of its technology education program. The quality indicators contained in this publication will serve this purpose. The narrative that follows illustrates how the *Quality Indicators for Technology Education Programs in Maryland* will fit into the evaluation process. To simplify this process, assessment can be divided into four major steps. They are: planning an assessment, conducting an assessment, reporting findings, and overcoming weaknesses.

Step 1 - **Planning an Assessment**

Before a program is assessed, decisions must be made concerning a) which program will be assessed, b) the membership of the assessment team, and c) when the assessment will take place. The assessment process may be initiated by a local administrator, a school principal, or a technology teacher. The assessment team should include one or more technology education teacher, a school administrator, a student, a parent, and a business representative. Team members should meet to become familiar with the quality indicators and assessment process.

Step 2 - **Conducting an Assessment**

The assessment process involves comparing a given technology education program to standards. In the process, the assessment team records whether the program meets each quality indicator. A condensed profile of the program assessment may be drawn using the *Technology Education Program Profile Form* (see section on *Assessment Forms*).

Step 3 - **Reporting the Findings of an Assessment**

The assessment team reports the strengths and weaknesses of the program to personnel responsible for correcting weaknesses. The weaknesses are explained and suggestions for correcting weaknesses are made on the *Continuous Improvement Report* (see section on *Assessment Forms*).

Step 4 - **Overcoming Weaknesses Identified in the Assessment**

Procedures and resources are employed to overcome the weaknesses. The assessment team monitors those procedures to determine their success in correcting weaknesses and recommends a time line for program reassessment.

An understanding of the classification and organization of the quality indicators is necessary before conducting an assessment of the technology education program.

The *Quality Indicators for Technology Education Programs in Maryland* are grouped into seven (7) areas. They are:

- A. Philosophy
- B. Population Served
- C. Instructional Program
- D. Advisory Committee
- E. Facilities/Equipment/Materials
- F. Administration/Supervision
- G. Instructional Staff

Each of the major areas includes statements of standards, criteria, and quality indicators.

For example, Philosophy is divided into three subtopics:

- 1.1 Content,
- 1.2 Development, and
- 1.3 Dissemination and Utilization.

Each of these subtopics contains a number of quality indicators to which the program may be compared. The process of assessing a program with the quality indicators is relatively simple. Next to each standard are the words "Yes" and "No." Assessing a program with the standard means indicating whether the program does or does not meet the quality indicator.

On the last page of each standard topic there is a section entitled "Summary for Profile." In this section a space is provided to record the number of quality indicators marked "No." Subtracting this number from the total number of indicators for the topic determines the number that meet the standard. The number of quality indicators met for each topic is used to compile a program profile. A *Technology Education Program Profile* is provided in the *Assessment Forms Section* following Standard Topic VII.

A major component of assessing a technology education program is the correction of identified weaknesses. It is recommended that a separate report be filled out for each quality indicator marked "No." A *continuous Improvement Report Form* is provided in the *Assessment Forms* section for this purpose. The report form should be completed by the assessment team.

After the *Continuous Improvement Report Forms* have been completed, they should be presented to administrators, school board members, or others responsible for the technology education program. The reports will provide guidance to the person(s) responsible for correcting program weaknesses. The correction process should be monitored by the assessment team, as needed, to assure that each weakness is corrected. After all weaknesses are corrected to the assessment team's satisfaction, the overall assessment process is completed.

Section A

PHILOSOPHY

A philosophy is an explicit statement of the beliefs that direct all aspects of a school system's curriculum. Developing a statement of philosophy allows educators to reach a consensus about the nature of the subject matter as it relates to the instructional program. A clear statement of philosophy, therefore, can aid the school system in developing goals, specifying instructional strategies, and assessing programs.

A comprehensive philosophy should begin by addressing the subject matter, its relationship to society, and its relationship to learners. Based upon a synthesis of these elements, a clear position statement should be developed to direct the structuring of the curriculum.

The technology education philosophy includes statements regarding the:

- a. Program mission (Why is the program important?),
- b. Program content,
- c. Teaching/learning strategies utilized, and
- d. The evaluation and updating of the program.

STANDARD: A. Philosophy - A philosophy is developed and utilized in the technology education program.

CRITERION: A.1. Content - The philosophy states the rationale for the technology education program. The philosophy also addresses the needs of society and the learner.

QUALITY INDICATORS:

The philosophy incorporates the mission of technology education:

A.1.1	To develop "technological literacy" through experiences in which resources (people, information, tools and machines, materials, energy, capital, and time) are used to solve problems and to meet human needs and desires.	Yes	No
A.1.2	To provide students with the basic understandings and current skills needed to function effectively in society.	Yes	No
A.1.3	To develop in all students the ability to reason, solve problems, create, construct, and use materials imaginatively.	Yes	No
A.1.4	To enable students to become wise consumers and productive members of the community.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

A.1.5 To apply science, mathematics, language arts, social studies, and technological concepts to solve practical problems and extend human capabilities.	Yes No
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The philosophy:

A.1.6 Is consistent with the current state technology education philosophy.	Yes No
A.1.7 Is consistent with state education goals and school improvement initiatives.	Yes No
A.1.8 Reflects the State Approved Learner Outcomes (goals) for Technology Education. See <i>Technology Education - A Maryland Curricular Framework</i> .	Yes No

CRITERION: A.2. Development - The philosophy is developed by the technology education staff.

QUALITY INDICATORS:

The statement of philosophy is:

A.2.1 Developed by the technology education staff using input from students, parents, administrators, supervisory personnel, and community members.	Yes No
A.2.2 Reviewed periodically and revised when necessary to reflect relevancy of the program.	Yes No

CRITERION: A.3. Dissemination and Utilization - The philosophy is applied to all facets of the technology education program.

QUALITY INDICATORS:

The philosophy is:

A.3.1 A statement in printed form, available and distributed to technology education staff, counselors, advisory committee members, appropriate administrators, and other interested persons.	Yes No
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QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

A.3.2 Utilized for program planning, development, and implementation.	Yes	No
A.3.3 Utilized for evaluation of the program.	Yes	No

Summary:

13	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Section B

POPULATION SERVED

Population served is defined as persons with differing age, racial/ethnic background, socio-economic status, academic differences, limited English proficiency, physical and mental disabilities, who will have access on an equal basis to the technology education program.

STANDARD: B. Population - The population is identified.

CRITERION: B.1. Enrollment - All population types are represented in the technology education program.

QUALITY INDICATORS:

Students from all population types are represented in the same proportion that they are enrolled in the school.

	Gender	Number enrolled in school	Number enrolled in a Technology Education course(s)	Percent enrolled in a Technology Education course(s)	Students in group represented in the same proportion that they are enrolled in the school.
B.1.1	Male				Yes No
B.1.2	Female				Yes No

	Race/Ethnicity	Number enrolled in school	Number enrolled in a Technology Education course(s)	Percent enrolled in a Technology Education course(s)	Students in group represented in the same proportion that they are enrolled in the school.
B.1.3	American Indian				Yes No
B.1.4	Asian				Yes No
B.1.5	African American				Yes No
B.1.6	Caucasian				Yes No
B.1.7	Hispanic				Yes No
B.1.8	Other				Yes No

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	Special Populations	Number enrolled in school	Number enrolled in a Technology Education course(s)	Percent enrolled in a Technology Education course(s)	Students in group represented in the same proportion that they are enrolled in the school
B.1.9	Limited English Proficiency				Yes No
B.1.10	Disabled Individuals				Yes No
B.1.11	Disadvantaged Persons				Yes No
B.1.12	Gifted and Talented				Yes No
B.1.13	Other (i.e., at risk etc.)				Yes No

CRITERION: B.2. Completion - All populations are successfully completing technology education course(s).

QUALITY INDICATORS:

	Gender	Number enrolled in Technology Education course(s)	Number successfully completing course(s)	Percent successfully completing course(s)	Students are successfully completing course(s)
B.2.1	Male				Yes No
B.2.2	Female				Yes No

	Race/Ethnicity	Number enrolled in Technology Education course(s)	Number successfully completing course(s)	Percent successfully completing course(s)	Students are successfully completing course(s)
B.2.3	American Indian				Yes No
B.2.4	Asian				Yes No
B.2.5	African American				Yes No
B.2.6	Caucasian				Yes No
B.2.7	Hispanic				Yes No
B.2.8	Other				Yes No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

	Special Populations	Number enrolled in Technology Education course(s)	Number successfully completing course(s)	Percent successfully completing course(s)	Students are successfully complete course(s)
B.2.9	Limited English Proficiency				Yes No
B.2.10	Disabled Individuals				Yes No
B.2.11	Disadvantaged Persons				Yes No
B.2.12	Gifted and Talented				Yes No
B.2.13	Other				Yes No

Summary:

26	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Section C**INSTRUCTIONAL PROGRAM**

Section C includes the following subsections:

- C.1 Instruction/Curriculum
- C.2 Curriculum Resources
- C.3 Teaching/Learning Strategies
- C.4 Instructional Program Evaluation
- C.5 Student Assessment

Standard C.1 is organized according to grade level. (K-5, 6-8, 9-10, and 11-12) Use only the portion(s) of this section that is appropriate to your program.

Section C.3, Teaching/Learning Strategies, includes all of the strategies that have proven effective in enabling students to achieve the technology education outcomes.

**TECHNOLOGY EDUCATION
INSTRUCTIONAL PROGRAM
Grades K-5**

The instructional program in technology education for grades K-5 develops students' awareness of technology. It reinforces basic learning through hands-on activities such as technology investigations, technology challenges, and product generation.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Express that people have created technology systems to satisfy basic needs and desires. (Expectancy 1.1.1)	Yes	No
C.1.2	Identify where technology is used in the school, home, and community. (Expectancy 1.1.3)	Yes	No
C.1.3	Express that technology has the potential for both positive and negative impacts. (Subgoal 2.2)	Yes	No
C.1.4	Identify formal and informal approaches to problem solving. (Expectancy 3.1.1)	Yes	No
C.1.5	Identify the relationship between science, mathematics, and technology. (Expectancy 6.1.1)	Yes	No
C.1.6	Describe examples of technology's role in shaping history. (Expectancy 6.4.1)	Yes	No
C.1.7	Identify technology-related careers. (Goal 7)	Yes	No
C.1.8	Express that technology is created by innovative men and women from diverse cultures. (Goal 8)	Yes	No
C.1.9	Investigate how things (technology systems) work. (Subgoal 1.2)	Yes	No
C.1.10	Apply knowledge, tools, and skills to solve practical problems. (Goal 3)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

Summary:

10	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

**TECHNOLOGY EDUCATION
INSTRUCTIONAL PROGRAM
Grades 6-8**

The instructional program in technology education for grades 6-8 is characterized by the term "exploration." Students explore the enterprises and institutions that use technology to meet human needs and desires.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Express that people have created technology systems to satisfy basic needs and desires. (Expectancy 1.1.1)	Yes	No
C.1.2	Define a technology system as a combination of resources acting together to solve problems. (Expectancy 1.1.2)	Yes	No
C.1.3	Identify the human institutions and enterprises that utilize technology including: manufacturing, construction, transportation, communication, health care, agriculture, commerce, law enforcement, education, family and household, etc. (Expectancy 1.1.3)	Yes	No
C.1.4	Identify the resources used to create technology systems, which include: people, information, tools and machines, materials, energy, capital, and time. (Expectancy 1.2.4)	Yes	No
C.1.5	Express awareness of the "core technologies" - the building blocks of all technology systems. They include mechanical technology, structural technology, fluid technology, electrical technology, electronics technology, optical technology, thermal technology, biotechnology, and materials technology. (Expectancy 1.2.5)	Yes	No
C.1.6	Express awareness of the relationships and impacts among technological achievement, the environment, the advancement of science, the individual, and society. (Subgoal 2.2)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.7	Express awareness of technology-related careers. (Subgoal 7.3)	Yes	No
C.1.8	Express awareness of the importance of the historical contributions of men and women of different cultures to the advancement of technology. (Subgoal 8.1)	Yes	No
C.1.9	Apply knowledge and skills in the creation of simple technology systems and processes. (Subgoal 5.1)	Yes	No
C.1.10	Apply knowledge and skill in the safe use of basic tools, machines, materials, and processes of technology. (Subgoal 5.2)	Yes	No
C.1.11	Utilize a systems approach when using technology to solve problems. (Subgoal 3.1)	Yes	No
C.1.12	Employ higher-order thinking skills for solving problems with technology. (Subgoal 3.2)	Yes	No
C.1.13	Utilize individual ingenuity when using technology to solve problems. (Subgoal 3.3)	Yes	No
C.1.14	Demonstrate the ability to work as a team member when using technology to solve problems. (Subgoal 3.5)	Yes	No
C.1.15	Identify personal interests and abilities related to technology-based careers. (Subgoal 7.1)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

15	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comment:

**TECHNOLOGY EDUCATION
INSTRUCTIONAL PROGRAM
Grades 9-10**

The instructional program in technology education for grades 9-10 is designed to develop technological literacy in all students. Technological literacy is the ability to interact successfully with technology, to assess the impacts of technology on everyday life and make appropriate decisions, and to apply conceptual knowledge to solve problems.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1 Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Demonstrate knowledge and skills related to the application of technology systems. (Subgoal 1.1)	Yes	No
C.1.2	Demonstrate knowledge and skills related to the functioning of a variety of technology systems. (Subgoal 1.2)	Yes	No
C.1.3	Demonstrate knowledge of the nature and characteristics of technology. (Subgoal 2.1)	Yes	No
C.1.4	Demonstrate knowledge of the relationships and impacts among technological achievement, the environment, the advancement of science, the individual, and society. (Subgoal 2.2)	Yes	No
C.1.5	Demonstrate knowledge of the evolution of technology. (Subgoal 2.3)	Yes	No
C.1.6	Utilize a systems approach in solving problems with technology. (Subgoal 3.1)	Yes	No
C.1.7	Employ higher-order thinking skills for solving problems with technology. (Subgoal 3.2)	Yes	No
C.1.8	Use collaborative and individual ingenuity for solving problems with technology. (Subgoal 3.3)	Yes	No
C.1.9	Utilize a variety of resources and processes to solve problems with technology. (Subgoal 3.4)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.10 To work as a team member in the solution of problem. (Subgoal 3.5)	Yes	No
C.1.11 Identify problems resulting from technological achievements. (Subgoal 4.1)	Yes	No
C.1.12 Utilize resources to develop a knowledge base for making informed decisions about technological issues. (Subgoal 4.2)	Yes	No
C.1.13 Assess the impact of technology on the individual, society, and the environment. (Subgoal 4.3)	Yes	No
C.1.14 Make judgements about technological issues. (Subgoal 4.4)	Yes	No
C.1.15 Create technology for human purposes through the skillful use of technological resources. (Subgoal 5.1)	Yes	No
C.1.16 Use technology resources in a safe and responsible manner. (Subgoal 5.2)	Yes	No
C.1.17 Apply mathematical concepts, processes, and skills while solving problems with technology. (Subgoal 6.1)	Yes	No
C.1.18 Apply scientific concepts, processes, and skills while solving problems with technology. (Subgoal 6.2)	Yes	No
C.1.19 Utilize communication skills while solving problems with technology. (Subgoal 6.3)	Yes	No
C.1.20 Apply social studies concepts, processes, and skills to explore and evaluate the impacts of technology. (Subgoal 6.4)	Yes	No
C.1.21 Identify personal interests and abilities related to technology-based careers. (Subgoal 7.1)	Yes	No
C.1.22 Investigate educational opportunities and requirements related to technology-based careers. (Subgoal 7.2)	Yes	No
C.1.23 Investigate career opportunities, trends, and requirements related to technology-based careers. (Subgoal 7.3)	Yes	No
C.1.24 Identify and demonstrate factors for employability and advancement in technology-based careers. (Subgoal 7.4)	Yes	No
C.1.25 Perform work tasks representative of those done by engineers. (Subgoal 7.5)	Yes	No
C.1.26 Perform work tasks representative of those done by technologists. (Subgoal 7.6)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.27 Perform work tasks representative of those done by technicians. (Subgoal 7.7)	Yes No
C.1.28 Perform work tasks representative of those done by craftspersons. (Subgoal 7.8)	Yes No
C.1.29 Describes the contributions of men and women of different cultures to the advancement of technology. (Subgoal 8.1)	Yes No
C.1.30 Describes the current and future implications of multicultural contributions to the advancement of technology. (Subgoal 8.2)	Yes No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

30	Number of Quality Indicators for this topic.
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

**TECHNOLOGY EDUCATION
INSTRUCTIONAL PROGRAM
Grades 11-12
(Advanced Technology Education)**

Advanced technology education is an instructional program in which students develop advanced skills and deeper understandings of selected technology systems. The focus of study for advanced technology education courses is "technology"-the application of knowledge, tools and skills to solve practical problems and extend human capabilities. The goal is the development of advanced technological literacy, which is the ability to interact successfully with technology, to assess the impacts of technology on everyday life and make appropriate decisions, and to apply conceptual knowledge to solve problems.

Advanced technology education courses provide a broad-based foundation of knowledge and skills relevant to the future engineer, technologist, technician, craftsperson. The scope of advanced technology education courses is more focused than the required high school course providing opportunities for students to develop deeper understandings of technological concepts and increasingly complex technical skills. These experiences are valuable to students as they make educational and career decisions and as they apply high school experiences to career endeavors. The learner outcomes for technology education remain the basis for these programs.

There are four approaches to the organization of advanced technology education courses. They are to develop courses based on:

- A. The Core Technologies
- B. The Engineering Design and Development Process
- C. Information Systems
- D. A Selected Enterprise or Institution that Uses Technology

**ADVANCED TECHNOLOGY EDUCATION COURSES
BASED ON
THE CORE TECHNOLOGIES**

The following standards apply to advanced technology education courses based on the core technologies. These courses will provide experiences in which students will extend and refine their knowledge of the core technologies and apply this knowledge to the solution of practical problems.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Demonstrate knowledge and skills regarding the functioning and application of the core technologies. (Goal 1)	Yes	No
C.1.2	Describe the nature of technology, and the relationships and impacts among technological achievement, the environment, the advancement of science, the individual and society. The context for this knowledge shall be historical, current and futuristic. (Goal 2)	Yes	No
C.1.3	Solve problems with technology using a systems approach, higher-order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools, and materials. (Goal 3)	Yes	No
C.1.4	Make ethical decisions about technology-related issues, including the development and use of technology and technology resources. (Goal 4)	Yes	No
C.1.5	Use technology resources -- including tools, machines, and materials -- in performing technological processes. (Goal 5)	Yes	No
C.1.6	Apply science, mathematics, language arts, social studies and technological concepts to solve practical problems and extend human capabilities. (Goal 6)	Yes	No
C.1.7	Apply knowledge of and perform tasks representative of technology-based careers, including engineers, technologists, technicians, and craftspersons. (Goal 7)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.8	Identify and describe the contributions to engineering and technology of men and women of different cultures. (Goal 8)	Yes	No
C.1.9	Design, create and apply problem solutions that incorporate mechanical technology . (Subgoal 5.1)	Yes	No
C.1.10	Design, create and apply problem solutions that incorporate structural technology . (Subgoal 5.1)	Yes	No
C.1.11	Design, create and apply problem solutions that incorporate fluid technology . (Subgoal 5.1)	Yes	No
C.1.12	Design, create and apply problem solutions that incorporate electrical technology . (Subgoal 5.1)	Yes	No
C.1.13	Design, create and apply problem solutions that incorporate electronics technology . (Subgoal 5.1)	Yes	No
C.1.14	Design, create and apply solutions to problems that incorporate optical technology . (Subgoal 5.1)	Yes	No
C.1.15	Design, create and apply solutions to problems that incorporate thermal technology . (Subgoal 5.1)	Yes	No
C.1.16	Design, create and apply solutions to problems that incorporate bio technology . (Subgoal 5.1)	Yes	No
C.1.17	Design, create and apply solutions to problems that incorporate materials technology . (Subgoal 5.1)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

17	Number of Quality Indicators for this topic.
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

**ADVANCED TECHNOLOGY EDUCATION COURSES
BASED ON
ENGINEERING DESIGN AND DEVELOPMENT**

The following standards apply to advanced technology education courses based on the engineering design and development process.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Demonstrate knowledge and skills regarding the engineering and development process. (Goal 1)	Yes	No
C.1.2	Describe the nature of technology, and the relationships and impacts among technological achievement, the environment, the advancement of science, the individual and society. The context for this knowledge shall be historical, current and futuristic. (Goal 2)	Yes	No
C.1.3	Solve problems with technology using a systems approach, higher-order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools, and materials. (Goal 3)	Yes	No
C.1.4	Make ethical decisions about technology-related issues, including the development and use of technology and technology resources. (Goal 4)	Yes	No
C.1.5	Use technology resources -- including tools, machines, and materials -- in performing technological processes. (Goal 5)	Yes	No
C.1.6	Apply science, mathematics, language arts, social studies and technological concepts to solve practical problems and extend human capabilities. (Goal 6)	Yes	No
C.1.7	Apply knowledge of and perform tasks representative of technology-based careers, including engineers, technologists, technicians, and craftspersons. (Goal 7)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.8	Identify and describe the contributions to engineering and technology by men and women of different cultures. (Goal 8)	Yes	No
C.1.9	Identify a problem or need that can be met through technological solutions. (Expectancy 3.1.2)	Yes	No
C.1.10	Research the problem. (Subgoal 4.2)	Yes	No
C.1.11	"Brainstorm" alternatives in solving a problem with technology. (Expectancy 3.1.2)	Yes	No
C.1.12	Evaluate and select a viable technological approach. (Subgoal 4.4)	Yes	No
C.1.13	Design a technological solution to a problem. (Expectancy 3.4.3)	Yes	No
C.1.14	Create technology systems through the skillful use of tools, machines, and materials. (Subgoal 5.1)	Yes	No
C.1.15	Test, analyze, evaluate, and refine technological solutions to problems. (Expectancy 5.1.5)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

15	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

**ADVANCED TECHNOLOGY EDUCATION COURSES
BASED ON
INFORMATION SYSTEMS**

These courses will provide experiences in using information systems for personal and career purposes. Instruction and experiences will deal with communication systems, technical graphics, computer applications, graphic generation, publishing, audio systems, video systems, and telecommunications.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Demonstrate knowledge and skills regarding information systems technology. (Goal 1)	Yes	No
C.1.2	Describe the nature of technology, and the relationships and impacts among technological achievement, the environment, the advancement of science, the individual and society. The context for this knowledge shall be historical, current and futuristic. (Goal 2)	Yes	No
C.1.3	Solve problems with technology using a systems approach, higher-order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools, and materials. (Goal 3)	Yes	No
C.1.4	Make ethical decisions about technology-related issues, including the development and use of technology and technology resources. (Goal 4)	Yes	No
C.1.5	Use technology resources -- including tools, machines, and materials -- in performing technological processes. (Goal 5)	Yes	No
C.1.6	Apply science, mathematics, language arts, social studies and technological concepts to solve practical problems and extend human capabilities. (Goal 6)	Yes	No
C.1.7	Apply knowledge of and perform tasks representative of technology-based careers, including engineers, technologists, technicians, and craftspersons. (Goal 7)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.8	Identify and describe the contributions to engineering and technology of men and women of different cultures. (Goal 8)	Yes	No
C.1.9	Use a variety of information systems to perform the operations of information gathering, processing, storing, retrieving, encoding, transmitting, receiving, and decoding. (Goal 5)	Yes	No
C.1.10	Use drafting instruments to produce technical graphics in orthographic and pictorial projections. (Expectancy 6.3.4)	Yes	No
C.1.11	Use a microcomputer and appropriate software to produce computer assisted drawings (CAD). (Expectancy 6.3.4)	Yes	No
C.1.12	Use information systems for computer assisted design/ computer assisted manufacturing (CAD/CAM) for designing and producing a product. (Subgoal 5.1)	Yes	No
C.1.13	Program a computer-controlled device (robot, machine) to perform functions. (Expectancy 5.1.3)	Yes	No
C.1.14	Design, assemble, and interface a technology system with a computer, then, program the system to perform functions. (Goal 5)	Yes	No
C.1.15	Use a variety of information systems for producing text and graphic images. (Subgoal 6.3)	Yes	No
C.1.16	Use a variety of information systems to produce audiovisual media. (Subgoal 6.3)	Yes	No
C.1.17	Use an information system for telecommunicating on an electronic network. (Subgoal 6.3)	Yes	No
C.1.18	Use a microcomputer to process and analyze data. (Subgoal 3.4)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

18	Number of Quality Indicators for this topic.
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

**ADVANCED TECHNOLOGY EDUCATION COURSES
BASED ON A
SELECTED ENTERPRISE OR INSTITUTION THAT UTILIZES TECHNOLOGY**

These courses will provide experiences in which students will demonstrate knowledge and skills related to a selected enterprise or institution that uses technology. The focus of study in these courses will be on the technology that supports the enterprise or institution. Examples include: manufacturing, transportation, communication, health care, agriculture, and commerce.

STANDARD: C. Instructional Program - The instructional program reflects the state and local technology education philosophy through its curriculum.

CRITERION: C.1. Instruction/Curriculum - Instruction is based on the learner outcomes for technology education.

QUALITY INDICATORS:

Instruction is provided that enables students to:

C.1.1	Demonstrate knowledge and skills regarding the technology that is used in a selected enterprise or institution. (Goal 1)	Yes	No
C.1.2	Describe the nature of technology, and the relationships and impacts among technological achievement, the environment, the advancement of science, the individual and society. The context for this knowledge shall be historical, current and futuristic. (Goal 2)	Yes	No
C.1.3	Solve problems with technology using a systems approach, higher-order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools, and materials. (Goal 3)	Yes	No
C.1.4	Make ethical decisions about technology-related issues, including the development and use of technology and technology resources. (Goal 4)	Yes	No
C.1.5	Use technology resources -- including tools, machines, and materials -- in performing technological processes. (Goal 5)	Yes	No
C.1.6	Apply science, mathematics, language arts, social studies and technological concepts to solve practical problems and extend human capabilities. (Goal 6)	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

C.1.7	Apply knowledge of and perform tasks representative of technology-based careers, including engineers, technologists, technicians, and craftspersons. (Goal 7)	Yes	No
C.1.8	Identify and describe the contributions to engineering and technology of men and women of different cultures. (Goal 8)	Yes	No
C.1.9	Demonstrate knowledge of the evolution, utilization, and significance of the technology systems used in the selected enterprise. (Goal 2)	Yes	No
C.1.10	Demonstrate knowledge of the organization, management, materials, finance, occupations, processes, and products of a selected enterprise. (Subgoal 1.2)	Yes	No
C.1.11	Demonstrate knowledge of the societal problems and benefits resulting from the technology systems used in a selected enterprise. (Expectancy 2.2.6)	Yes	No
C.1.12	Apply extended knowledge of the core technologies and problem-solving skills to the solution of practical problems. (Subgoal 3.1)	Yes	No
C.1.13	Create technology for human purposes through the skillful use of technology resources. (Subgoal 5.1)	Yes	No
C.1.14	Demonstrate the safe and effective use of technology resources including tools, machines, and materials to develop products and processes. (Subgoal 5.2)	Yes	No

Note: The information in parentheses indicates citations from *Technology Education - A Maryland Curricular Framework*.

Summary:

14	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: C.2. Curriculum Resources - The curriculum is developed utilizing various sources, resources, and strategies.

QUALITY INDICATORS:

The curriculum resources are developed considering:

C.2.1	The human growth and development needs of students.	Yes	No
C.2.2	Student interests.	Yes	No
C.2.3	Information gathered from parent and community contacts.	Yes	No
C.2.4	Information and suggestions from teachers, counselors and administrators/supervisors.	Yes	No
C.2.5	Recommendations from the advisory committee.	Yes	No
C.2.6	Local, state, and national curriculum materials.	Yes	No

Summary:

6	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

Teaching/learning strategies provide the experiences that enable students to achieve the learner outcomes for technology education. They require students to design, construct, test, analyze, evaluate, measure, solve problems, plan, calculate, research, investigate, and report. Students are encouraged to use global resources in all of the teaching/learning strategies. Six teaching-learning strategies have proven effective in producing the desired outcomes. They include:

1. Technology Challenge
2. Topic Investigation
3. Modular Technology Activity
4. Product Generation
5. Research and Experimentation
6. Engineering Design and Development

The following standards define these teaching/learning strategies.

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

TECHNOLOGY CHALLENGE

The "Technology Challenge" is a strategy designed to develop problem-solving skills. It incorporates both the explicit teaching of problem solving and laboratory practice. Challenge problems are generally identified by the teacher. Technology challenges may be completed in a single class period or long-term, requiring multiple class periods.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.1.1 Analyzing a problem and setting goals.	Yes	No
C.3.1.2 Identifying alternative ways to solve a problem.	Yes	No
C.3.1.3 Selecting resources to be used in the solution of the problem.	Yes	No
C.3.1.4 Using tools and equipment to process materials.	Yes	No
C.3.1.5 Constructing a prototype of the problem solution.	Yes	No
C.3.1.6 Testing, analyzing, and refining the problem solution.	Yes	No
C.3.1.7 Collecting and processing data.	Yes	No
C.3.1.8 Report to a group.	Yes	No

Summary:

8	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

TOPIC INVESTIGATION

The Topic Investigation teaching/learning strategy provides a way for students to learn about technology systems and technology related topics in the context of a "central theme." The central theme may be stated as a title or as an open-ended question. Students engaged in a Topic Investigation will choose and investigate a particular technology system or topic which relates to the central theme. Student knowledge and understanding of the central theme are gained through: 1) their inquiry into sub-elements of the theme, and 2) information shared by classmates about other sub-elements of the theme. This teaching/learning strategy may stress individual and/or collaborative student involvement in the learning activities.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.2.1	Selecting a technology related topic for investigation.	Yes	No
C.3.2.2	Researching a technology related topic.	Yes	No
C.3.2.3	Developing a report on a technology related topic.	Yes	No
C.3.2.4	Designing and producing a presentation aid related to a technology related topic.	Yes	No
C.3.2.5	Making a presentation on a technology related topic.	Yes	No

Summary:

5	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

MODULAR TECHNOLOGY ACTIVITY

Modular technology activities enable students to interact with specific technology systems that are not available in quantities for whole-class instruction. They are highly-structured, self-paced instructional packages that include background information, directions, hardware for manipulation, and learning assessments. These activities may involve students from 1 to 15 days.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.3.1	Interacting with a variety of significant, modern technology systems and/or enterprises.	Yes	No
C.3.3.2	Working cooperatively with a classmate.	Yes	No
C.3.3.3	Using self-paced instructional materials.	Yes	No
C.3.3.4	Assessing individual learning.	Yes	No
C.3.3.5	Analyzing technology systems and/or enterprises.	Yes	No
C.3.3.6	Solving problems with technology.	Yes	No
C.3.3.7	Reading and understanding written information.	Yes	No
C.3.3.8	Writing a journal to record procedures and problems encountered in a manner that others can understand.	Yes	No

Summary:

8	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

PRODUCT GENERATION

The product generation teaching/learning strategy involves students in the processes of design, planning, production, marketing, and distribution. Students assume a variety of roles as they develop hardware and software products.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.4.1	Identifying a need that can be met by a product.	Yes	No
C.3.4.2	Conducting research on a product.	Yes	No
C.3.4.3	Planning a product.	Yes	No
C.3.4.4	Producing prototypes.	Yes	No
C.3.4.5	Planning a production system.	Yes	No
C.3.4.6	Producing a product(s).	Yes	No
C.3.4.7	Monitoring a production process.	Yes	No
C.3.4.8	Comparing results with desired outcomes.	Yes	No
C.3.4.9	Making changes and adjustments.	Yes	No
C.3.4.10	Marketing and/or distributing a product.	Yes	No

Summary:

10	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

RESEARCH AND EXPERIMENTATION

The research and experimentation teaching/learning strategy focuses on student interests and the scientific approach to problem solving. It utilizes systematic procedures in identifying problems, asking questions, gathering data, analyzing results, and forming conclusions.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.5.1	Identifying a problem.	Yes	No
C.3.5.2	Researching the literature.	Yes	No
C.3.5.3	Stating a hypothesis.	Yes	No
C.3.5.4	Planning an experiment.	Yes	No
C.3.5.5	Designing and fabricating test apparatus.	Yes	No
C.3.5.6	Conducting an experiment.	Yes	No
C.3.5.7	Collecting data.	Yes	No
C.3.5.8	Analyzing data.	Yes	No
C.3.5.9	Comparing results of the experiment with the hypothesis.	Yes	No
C.3.5.10	Reporting findings.	Yes	No

Summary:

10	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

TECHNOLOGY EDUCATION TEACHING/LEARNING STRATEGIES

ENGINEERING DESIGN AND DEVELOPMENT

The engineering design and development teaching/learning strategy requires students to create products and processes to solve problems and enhance human capabilities. Students will employ a systematic model for problem solving including the elements of resources, input, process, output, and feedback. This is a long-term activity that may involve students for a quarter or a semester.

CRITERION: C.3. Teaching/Learning Strategies - Teaching/learning strategies are effective in enabling students to achieve the learner outcomes for technology education.

QUALITY INDICATORS:

Teaching/learning experiences involve students in:

C.3.6.1	Identifying problems or needs that can be met through technological solutions.	Yes	No
C.3.6.2	Demonstrating research skills in developing an information base for design and development.	Yes	No
C.3.6.3	Brainstorming alternatives in solving a problem with technology.	Yes	No
C.3.6.4	Evaluating possible solutions and selecting a viable approach.	Yes	No
C.3.6.5	Designing a technological solution to a problem.	Yes	No
C.3.6.6	Creating technology systems through the skillful use of technology resources including tools, machines, and materials.	Yes	No
C.3.6.7	Testing, analyzing, and refining solutions to problems.	Yes	No

Summary:

7	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: C.4. Instructional Program Evaluation - The instructional program is structured to ensure that a continuous evaluation process is utilized for program development.

QUALITY INDICATORS:

The instructional program undergoes a comprehensive evaluation every four (4) years.
The evaluation:

C.4.1	Utilizes the state <i>Program Standards for Technology Education</i> .	Yes	No
C.4.2	Is performed by: a. Advisory Committee members, b. Teachers, including technology education staff, c. Students, d. Parents, e. Administrators, and f. Supervisors	Yes	No
C.4.3	Provides the basis for an action plan for program revision. The plan provides for correcting deficiencies and is used to promote, develop, and improve the instructional program.	Yes	No

Summary:

3	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: C.5. Student Assessment - The instructional staff assumes responsibility for student assessment and evaluation.

QUALITY INDICATORS:

C.5.1	Student assessment is an integral part of instruction.	Yes	No
C.5.2	Results of the student assessment process are reported to students, parents, teachers, counselors, and administrators, as appropriate.	Yes	No
C.5.3	Results of the student assessment process are used to modify and enhance individual instruction.	Yes	No
C.5.4	Students have opportunities to contribute to the refinement of the assessment process.	Yes	No

Summary:

4	Number of Quality Indicators for this topic
	Minus the number of "No's" marked
	Total number of Quality Indicators marked "Yes"

Comments:

Section D

ADVISORY COMMITTEE

The advisory committee is an organized group of persons who serve as a link between home, school, and the community. The advisory committee has defined responsibilities and plays an important role in the efforts to improve programs.

STANDARD: D. Advisory Committee - An advisory committee is organized and has the responsibility for advising and assisting school personnel concerned with the technology education program.

CRITERION: D.1. Membership - An advisory committee is representative of the local community.

QUALITY INDICATORS:

An advisory committee:

D.1.1	Exists with a minimum of three members, excluding technology education teachers.	Yes	No
D.1.2	Members are selected or recommended by technology education staff and administrators.	Yes	No
D.1.3	Includes representatives of the community, such as students, parents/guardians, business/industry persons, and representatives from community agencies.	Yes	No

CRITERION: D.2. Meetings - An advisory committee operates within a planned program of work.

An advisory committee:

D.2.1	Meets formally at least once each year.	Yes	No
D.2.2	Has representatives that meet annually with the school administration to review and discuss concerns of the technology education program.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: D.3. Roles and Responsibilities - An advisory committee assists technology education staff regarding program improvement.

An advisory committee:

D.3.1	Makes recommendations to the technology education staff concerning new instructional programs and long-range planning.	Yes	No
D.3.2	Makes recommendations to the technology education staff concerning the selection and evaluation of instructional materials and equipment.	Yes	No
D.3.3	Evaluates new courses at the end of the first year and each ongoing course in a timely and periodic manner.	Yes	No
D.3.4	Makes recommendations concerning design, use, and updating of facilities.	Yes	No
D.3.5	Provides resources such as, guest speakers, demonstrations, field trips, and equipment.	Yes	No

CRITERION: D.4. Program Promotion - An advisory committee shares responsibility for actively promoting the technology education program.

The advisory committee:

D.4.1	Takes an active role in interpreting and promoting the technology education program to persons and organizations within the community.	Yes	No
D.4.2	Actively supports and promotes the program with the school board and administrators when appropriate.	Yes	No

Summary:

12	Number of Quality Indicators for this topic
	Number of Quality indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Section E

FACILITIES, EQUIPMENT, AND MATERIALS

Facilities, equipment, and materials comprise the physical environment in which the technology education program is conducted. Some of the resources that support the technology education program may be located outside of the laboratory. For example, access to global resources may be located in the media center.

STANDARD: E. Facilities/Equipment/Materials - Adequate and appropriate facilities, space, equipment, supplies, and materials are provided to enable students to achieve the learner outcomes for technology education.

CRITERION: E.1. Facilities - The facilities are designed to provide for effective implementation of the technology education program.

QUALITY INDICATORS:

E.1.1	Facilities, equipment, and materials support the teaching/learning strategies used.	Yes	No
E.1.2	Adequate space is provided for student and instructor work stations.	Yes	No
E.1.3	Facilities include adequate provisions for exhaust and ventilation, acoustics and illumination.	Yes	No
E.1.4	The appearance and arrangement of the laboratory reflect the mission of the program.	Yes	No
E.1.5	A telephone line is accessible for telecommunications activities.	Yes	No
E.1.6	The facility is accessible to disabled students.	Yes	No
E.1.7	The laboratory includes a classroom seating area.	Yes	No
E.1.8	The laboratory can facilitate small group meetings.	Yes	No
E.1.9	The laboratory includes a design area.	Yes	No
E.1.10	The laboratory includes a research area.	Yes	No
E.1.11	The laboratory includes a modular instructional activity area.	Yes	No
E.1.12	The laboratory includes a dynamic testing area.	Yes	No
E.1.13	The laboratory includes a production/fabrication area.	Yes	No
E.1.14	The laboratory includes teacher office space.	Yes	No

E.1.15	The laboratory includes material storage area.	Yes	No
E.1.16	The laboratory includes project storage area.	Yes	No
E.1.17	The laboratory includes a finishing area.	Yes	No
E.1.18	Illumination is sufficient and well placed.	Yes	No
E.1.19	Temperature, humidity, and air movement are within comfort limits.	Yes	No
E.1.20	Ventilation is adequate.	Yes	No
E.1.21	Cleanliness and sanitation are evident throughout the laboratory.	Yes	No

CRITERION: E.2. Safety - Facilities, equipment, and materials meet safety standards.

QUALITY INDICATORS:

E.2.1	Ample space is provided for machines and other equipment.	Yes	No
E.2.2	Work tables are secured to the floor and table tops are secured to legs or bases.	Yes	No
E.2.3	Permanently placed machines are fastened to the floor or bench.	Yes	No
E.2.4	Safety zones are clearly marked around each piece of equipment.	Yes	No
E.2.5	Safety posters are posted at each piece of fixed equipment.	Yes	No
E.2.6	Approved eye protection equipment is worn by each person who enters a laboratory where material is being formed or separated.	Yes	No
E.2.7	Eye protection equipment is properly maintained.	Yes	No
E.2.8	Face shields are worn when working with hot metal or power-driven machines.	Yes	No
E.2.9	Machine guards are utilized.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: E.3. Instructional Materials - Adequate instructional materials are provided to meet program goals.

QUALITY INDICATORS:

E.3.1	Instructional materials are adequate to support current technology education teaching/learning strategies.	Yes	No
E.3.2	Audiovisual resources are relevant and readily available.	Yes	No
E.3.3	There is an ongoing review of instructional materials.	Yes	No

Summary:

30	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Section F

ADMINISTRATION AND SUPERVISION

The Administration/Supervision Staff is defined as the personnel at the school or central office who is responsible for supervising and providing leadership for the technology education program.

STANDARD: F. Administration/Supervision - The administrative/supervisory staff has the responsibility to assist in management, evaluation, and promotion of the technology education program.

CRITERION: F.1. Management - The administrative/supervisory staff manages the technology education program.

QUALITY INDICATORS:

School-based administrative/supervisory personnel:

F.1.1	Organizes and utilizes a technology education advisory committee.	Yes	No
F.1.2	Manages the financial aspects of the technology education program.	Yes	No
F.1.3	Assists in planning facilities and makes recommendations for purchase and maintenance of equipment.	Yes	No

Central office-based administrative/supervisory personnel:

F.1.4	Directs long-range planning for the technology education program.	Yes	No
F.1.5	Assists in planning facilities and makes recommendations for purchase and maintenance of equipment.	Yes	No
F.1.6	Makes recommendations concerning staffing.	Yes	No
F.1.7	Manages the planning, implementation, and evaluation of in-service education programs for technology education.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: F.2. Evaluation - The administrative/supervisory staff has responsibility for directing evaluation activities.

QUALITY INDICATORS:

Central office based and school based administrative/supervisory personnel:

F.2.1	Participate in the evaluation of the technology education program.	Yes No
F.2.2	Utilize the results of evaluations to improve the technology education program.	Yes No

CRITERION: F.3. Promotion - The administrative/supervisory personnel promotes technology education by establishing a comprehensive public relations program.

QUALITY INDICATORS:

Administrative/supervisory personnel:

F.3.1	Utilizes a variety of techniques to promote the technology education program, i.e., brochures, open-house.	Yes No
F.3.2	Promotes technology education programs to persons in various educational settings, i.e., counselors.	Yes No
F.3.3	Promotes the technology education program to persons in the community utilizing newspaper articles, exhibits, etc.	Yes No

Summary:

12	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Section G

INSTRUCTIONAL STAFF

The Instructional Staff is defined as the personnel responsible for teaching the technology education program.

STANDARD: G. Instructional Staff - The instructional staff exhibits professionalism, is qualified, and assumes responsibility for conducting the instructional program.

CRITERION: G.1. Education/Certification - The instructional staff has the educational preparation necessary to conduct the instructional program.

QUALITY INDICATORS:

Technology education teachers have:

G.1.1	A baccalaureate degree.	Yes	No
G.1.2	Certification in Industrial Arts/Technology Education. (Middle and High School Teachers)	Yes	No
G.1.3	A continuing professional development plan that includes appropriate baccalaureate and graduate programs.	Yes	No
G.1.4	Preparation in the philosophy of technology education.	Yes	No
G.1.5	Educational preparation in planning and implementing the curriculum.	Yes	No
G.1.6	Educational preparation in student assessment techniques.	Yes	No
G.1.7	Educational preparation to establish and utilize procedures that create a safe and positive learning environment.	Yes	No
G.1.8	Educational preparation to work with all population types.	Yes	No
G.1.9	Educational preparation to address current and future trends in technology education.	Yes	No
G.1.10	Educational preparation for integrating science, mathematics, language arts, social studies, and technological concepts into the program.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

Technology education teachers:

G.1.11	Participate in professional organizations.	Yes	No
G.1.12	Contribute to staff development efforts.	Yes	No

CRITERION: G.2. Instruction - The instructional staff facilitates learning through instructional activities.

QUALITY INDICATORS:

The instructional staff:

G.2.1	Assumes responsibility for planning, organizing, and conducting instruction.	Yes	No
G.2.2	Assists in developing and revising the program curriculum, based upon local and state curriculum guides and policies.	Yes	No
G.2.3	Maintains a comprehensive list of community resources that may be used in the delivery of the program. (i.e., field trips, community service projects, speakers, and community agencies.)	Yes	No

CRITERION: G.3. Management - The instructional staff manages the instructional program.

QUALITY INDICATORS:

The instructional staff:

G.3.1	Maintains organized records and reports.	Yes	No
G.3.2	Makes and prioritizes recommendations for the purchase of material and equipment.	Yes	No
G.3.3	Assesses needs for supplies, materials, and equipment.	Yes	No
G.3.4	Establishes a classroom management system that promotes a safe and positive learning environment.	Yes	No

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

CRITERION: G.4. Evaluation - The instructional staff assumes responsibility for evaluating the technology education program.

QUALITY INDICATORS:

The instructional staff:

G.4.1	Conducts a formal self-evaluation of professional performance utilizing local and state technology education standards and other criteria.	Yes	No
G.4.2	Conducts an ongoing informal evaluation of the technology education program.	Yes	No

Summary:

21	Number of Quality Indicators for this topic
	Number of Quality Indicators marked "No"
	Number of Quality Indicators marked "Yes"

Comments:

Appendix

QUALITY INDICATORS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND

Assessment Forms

Technology Education Program Profile

DIRECTIONS: Fill in the number of quality indicators met in each standard topic.

Identification Number	Description	Number of Quality Indicators For This Topic	Yes Responses	No Responses
Section A	Philosophy	13		
Section B	Population	26		
Section C.1	Instruction/Curriculum Technology Education Grades K-5	10		
Section C.1	Instruction/Curriculum Technology Education Grades 6-8	23		
Section C.1	Instruction/Curriculum Technology Education Grades 9-10	30		
Section C.1	Instruction/Curriculum Advanced Technology Education Core Technologies	17		
Section C.1	Instruction/Curriculum Advanced Technology Education Engineering Design and Development	15		
Section C.1	Instruction/Curriculum Advanced Technology Education Information Systems	18		
Section C.1	Instruction/Curriculum Advanced Technology Education Technology Enterprises	14		
Section C.2	Curriculum Resources	6		
Section C.3	Teaching/Learning Strategies Technology Challenges	8		
Section C.3	Teaching/Learning Strategies Technology Investigations	6		
Section C.3	Teaching/Learning Strategies Modular Technology Activities	8		
Section C.3	Teaching/Learning Strategies Product Generation	10		

Technology Education Program Profile (continued)

Identification Number	Description	Number of Quality Indicators For This Topic	Yes Responses	No Responses
Section C.3	Teaching/Learning Strategies Research & Experimentation	10		
Section C.3	Teaching/Learning Strategies Engineering Design & Development	7		
Section C.4	Instructional Program Evaluation	3		
Section C.5	Student Assessment	4		
Section D	Advisory Committee	12		
Section E	Facilities, Equipment, and Materials	30		
Section F	Administration and Supervision	12		
Section G	Instructional Staff	21		

Shaded areas indicate topics that may not be relevant to all programs. In these areas, complete only those lines that are appropriate for your program.

IMPROVEMENT REPORT

DIRECTIONS: Complete this form for each quality indicator that you answered "NO" to.

School: _____ Reported By _____ Date: _____

Quality indicator not being met: _____

Priority for Improvement: High Medium Low

Person(s) responsible for improvement: _____

Plan for Improvement:

Resources Required:

Estimated Cost: \$ _____

Estimated Completion Date: _____

Date Standard Met: _____

GLOSSARY

Advanced Technology Education - Advanced technology education is an instructional program in which students develop advanced skills and deeper understandings of selected technology systems.

Advanced Technology Education Program - A series of related courses that enable students to develop a significant knowledge and skills base related to a selected technology system or process.

Core Technologies - The building blocks from which all technology systems are derived, which include mechanical technology, structural technology, fluid technology, electrical technology, electronics technology, optical technology, thermal technology, biotechnology, and materials technology.

Prototype - A model of a final product or structure that is built to help evaluate the soundness of a design and to discover unanticipated problems. **Technology** - The application of knowledge, tools and skills to solve practical problems and extend human capabilities.

Systems Approach - The use of a formal method (system) to solve technological problems. It includes: defining a problem, setting goals, developing alternative solutions, selecting the best solution, implementing the solution, evaluating the actual results, and making necessary changes.

Technology Education - Technology education is an integrated, experienced-based instructional program designed to prepare a population that is knowledgeable about technology - its evolution, systems, techniques, utilization, and social and cultural significance.

Technological Literacy - The abilities to interact successfully with technology, to assess the impacts of technology on everyday life and make appropriate decisions, and to apply conceptual knowledge in order to solve problems.

Technology System - A combination of resources (people, information, tools and machines, materials, time, energy, and capital) working together to solve problems and extend human capabilities.

STANDARDS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND
REVIEWER PROFILE SHEET

Before reading the document, please supply the following information in the space provided:

Name of respondent (please print): _____

Organization represented, if any: _____

Address: _____

Phone: (___ ___) ___ - ___ - ___

Fax: (___ ___) ___ - ___ - ___

E-mail: _____

Date: _____

Gender Female Ethnicity: African American, Caucasian,
 Male Latino/Hispanic, Asian/Pacific Islander,
 Other (please specify) _____

Age 18-25 26-35 36-45 46-55 Over 55

To assist in determining the perspective of this reviewer, please take a moment to check the appropriate boxes.

My primary interest in reviewing this document is as a(n):

Please specify public school private school

<input type="checkbox"/> Teacher	<input type="checkbox"/> Academic Administrator	<input type="checkbox"/> Non-Academic Affiliate
<input type="checkbox"/> Pre-K		
<input type="checkbox"/> Elementary	<input type="checkbox"/> Curriculum Specialist	<input type="checkbox"/> Trade Associate
<input type="checkbox"/> Middle	<input type="checkbox"/> Principal/V. Principal	<input type="checkbox"/> Government Agency
<input type="checkbox"/> High	<input type="checkbox"/> Superintendent	<input type="checkbox"/> Business & Industry
<input type="checkbox"/> 2 -Year College	<input type="checkbox"/> Education Association	<input type="checkbox"/> Other (please specify)
<input type="checkbox"/> 4-Year College/University	<input type="checkbox"/> Other (please specify)	_____
<input type="checkbox"/> Other (Please specify)	_____	

Parent/Guardian Student Government Official

My primary interest in education is:

<input type="checkbox"/> Science	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Technology
<input type="checkbox"/> Vocational	<input type="checkbox"/> Humanities	<input type="checkbox"/> Engineering
<input type="checkbox"/> Other (please specify)	_____	

Please return these forms to:
Robert Gray, Specialist in Technology Education
Maryland State Department of Education
Division of Career Technology and Adult Learning
200 West Baltimore Street
Baltimore, MD 21201-2595
Fax (410) 333-2099

**STANDARDS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND
REVIEW AND COMMENT FORM**

SECTION F - ADMINISTRATION/SUPERVISION

How thoroughly did you read this section? (check one)

- All the way through Skimmed or read parts of it
 Did not read this section. If not, please tell us why you did not read this section and skip to the next major section. _____

The opening statement describes the purpose and elements of this section.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly

Comments: *If you have checked disagree or disagree strongly, please provide comments.*

The Standard and Criteria are clearly stated.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly

Comments: *If you have checked disagree or disagree strongly, please provide comments.*

The Quality Indicators adequately address the standard and criteria.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly

Comments: *If you have checked disagree or disagree strongly, please provide comments.*

This section of the document should be printed:

- as it is with major editorial revision
 with minor editorial revision with substantive revision

Overall Comments:

BEST COPY AVAILABLE

60

**STANDARDS FOR TECHNOLOGY EDUCATION PROGRAMS IN MARYLAND
REVIEW AND COMMENT FORM**

SECTION G - INSTRUCTIONAL STAFF

How thoroughly did you read this section? (check one)

- All the way through Skimmed or read parts of it
 Did not read this section. If not, please tell us why you did not read this section and skip to the next major section. _____

The opening statement describes the purpose and elements of this section.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly
Comments: *If you have checked disagree or disagree strongly, please provide comments.*

The Standard and Criteria are clearly stated.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly
Comments: *If you have checked disagree or disagree strongly, please provide comments.*

The Quality Indicators adequately address the standard and criteria.

- Agree Strongly Agree Cannot Judge Disagree Disagree Strongly
Comments: *If you have checked disagree or disagree strongly, please provide comments.*

This section of the document should be printed:

- as it is with major editorial revision
 with minor editorial revision with substantive revision

Overall Comments:

