

Michigan Curriculum Framework Technology Content Standards

OVERVIEW OF TECHNOLOGY CONTENT STANDARDS

All students will:

Use and transfer technological knowledge and skills for life roles (family member, citizen, worker, consumer, lifelong learner);

Using and Transferring

Use technologies to input, retrieve, organize, manipulate, evaluate, and communicate information;

***Using Information
Technologies***

Apply appropriate technologies to critical thinking, creative expression, and decision-making skills;

***Applying Appropriate
Technologies***

Employ a systematic approach to technological solutions by using resources and processes to create, maintain, and improve products, systems, and environments;

***Employing Systematic
Approach***

Apply ethical and legal standards in planning, using, and evaluating technology; and

Applying Standards

Evaluate the societal and environmental impacts of technology and forecast alternative uses and possible consequences to make informed civic, social, and economic decisions.

***Evaluating and
Forecasting***

USING AND TRANSFERRING

Content Standard 1: All students will use and transfer technological knowledge and skills for life roles (family member, citizen, worker, consumer, lifelong learner).

Early Elementary	Later Elementary	Middle School	High School
<i>(Family Member)</i>			
1. Identify technology in the home.	1. Compare/contrast the impact of technology in the home today and in the past.	1. Identify a need and create or develop a new technology for the home.	1. Identify a need and create or develop a new technology for the home. 2. Identify an emerging technology and forecast impacts of that technology on the family.
<i>(Consumer)</i>			
2. Identify technological sources of information.	2. Compare/contrast the impact of messages from different technological sources.	2. Use technology to create a message that promotes a product/service.	3. Participate in cooperative research and development projects which study consumer satisfaction of comparable products and services.
<i>(Consumer)</i>			
3. Identify technological means used to buy and sell products and services.	3. Compare/contrast the technological means for financial transfer.	3. Design and build a model of a technological system to buy or sell a product or service.	4. Participate in a real world context which uses a technological system for financial transfers.

(Citizen)

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| 4. Recognize/explore technological systems in your community. | 4. Compare/contrast technological resources of two different communities. | 4. Demonstrate technological resources and systems that might be used to address social, civic, and economic issues. | 5. Identify a social, civic or economic issue and propose a technological solution. |
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(Worker)

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| 5. Identify various technologically related careers. | 5. Identify job opportunities and ways technology is related to these opportunities. | 5. Use a variety of technological resources to explore career paths and identify areas of interest. | 6. Evaluate present and future job markets in technology related fields. |
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(Life Long Learner)

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| 6. Demonstrate the proper care of technological systems and components. | 6. Demonstrate the proper care of technological systems and components. | 6. Demonstrate the proper care of technological systems and components. | 7. Demonstrate the proper care of technological systems and components. |
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USING INFORMATION TECHNOLOGIES

Content Standard 2: All students will use technologies to input, retrieve, organize, manipulate, evaluate, and communicate information.

Early Elementary	Later Elementary	Middle School	High School
<i>(Communication)</i>			
1. Input and retrieve information from a technological system (including the practice of word processing skills).	1. Interpret, analyze and evaluate information with the assistance of technology (voice, data, video, graphics, etc).	1. Demonstrate skill using technologies to prepare, evaluate and synthesize information collected and stored (voice, data, video, graphics, etc).	1. Use technologies to demonstrate skills and a systematic solution to a problem(s) (voice, data, video, graphics, etc).
<i>(Retrieve / Manipulate / Communicate)</i>			
2. Process information retrieved electronically.	2. Use search strategies to locate and retrieve information electronically. 3. Retrieve and communicate information using a technological system (voice, data, video, graphics, etc).	2. Gather information about a given technological problem, develop possible solutions, and generate a best solution using multiple technologies. 3. Retrieve, communicate and input information using a technological system (voice, data, video, graphics, etc).	2. Given a scenario, develop multiple options and present the solutions using a variety of technologies. 3. Retrieve, communicate, organize, evaluate, and manipulate information using a technological system (voice, data, video, graphics, etc).
<i>(Evaluate)</i>			
4. Evaluate information received through technologies.	4. Evaluate information received through technologies.	4. Evaluate information received through technologies.	4. Evaluate information received through technologies.

APPLYING APPROPRIATE TECHNOLOGIES

Content Standard 3: All students will apply appropriate technologies to critical thinking, creative expression, and decision making skills.

Early Elementary	Later Elementary	Middle School	High School
<i>(Decision - Making)</i>			
1. Explore technological solutions to a problem.	1. Compare and contrast technological solutions to problems of today and the past.	1. Investigate how different cultures use technology to solve similar problems.	1. Apply technological procedures to overcome obstacles when implementing a solution to a problem.
<i>(Creative Expression)</i>			
2. Use a variety of technologies to express ideas (voice, data, video, graphics, etc).	2. Use technology to communicate a solution for a variety of purposes (voice, data, video, graphics, etc).	2. Use technologies as tools for creative expression and communication of ideas (voice, data, video, graphics, etc).	2. Represent ideas using a combination of technologies aimed at reaching a diverse audience (voice, data, video, graphics, etc).
<i>(Decision - Making / Critical Thinking)</i>			
3. Identify several technological options to perform a task. 4. Use technologies to organize thoughts in a logical process (voice, data, video, graphics, etc).	3. Analyze problems and identify technologies and systems that could solve them. 4. Use technologies to organize thoughts in a logical process (voice, data, video, graphics, etc).	3. Use several technological methods to perform a given task and analyze advantages and disadvantages of each. 4. Use technologies to organize thoughts in a logical process (voice, data, video, graphics, etc).	3. Evaluate decisions using technology. 4. Use technologies to organize thoughts in a logical process (voice, data, video, graphics, etc).

EMPLOYING SYSTEMATIC APPROACH

Content Standard 4: All students will employ a systematic approach to technological solutions by using resources and processes to create, maintain and improve products, systems, and environments.

Early Elementary	Later Elementary	Middle School	High School
<i>(Systems)</i>			
1. Use the basic terminology for a variety of technological systems (i.e. input, process, output, and feedback).	1. Construct technological systems which use input, process, output, and feedback.	1. Construct technological systems that exhibit continuous improvement.	1. Design and construct technological systems that exhibit continuous improvement.
<i>(Graphic Technological Solutions)</i>			
2. Present technological solutions using sketches and drawings.	2. Present technological solutions using scale and proportion in sketches and drawings.	2. Presents technological solutions using scale and proportion in multiview sketches and drawings.	2. Create working drawings from sketches to meet appropriate industrial standards.
<i>(Measurement)</i>			
3. Use measurement to determine lengths, widths, and heights to construct and record technological solutions to problems.	3. Use measurements of dimension (length, area, volume) to construct technological solutions to problems.	3. Use measurements of dimension and capacity as criteria to produce and analyze technological solutions to problems.	3. Use measurements of dimension and capacity as criteria to produce and evaluate technological solutions to problems.
4. Transfer and record measurements from technological solutions to problems.	4. Transfer measurements for the purposes of marking and layout in producing technological solutions to problems.	4. Transfer measurements within appropriate tolerances for the purposes of producing technological solutions to problems.	4. Transfer measurements within appropriate tolerances for the purposes of producing and evaluating technological solutions to problems.

(Processes)

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| 5. Explore and compare tools used in cutting, forming, fastening, and finishing materials to produce technological solutions to problems. | 5. Analyze, select, and use the appropriate tools for cutting, forming, fastening, and finishing materials to produce technological solutions to problems. | 5. Use industrial tools, materials, equipment, and processes to produce prototypes and technological solutions to problems. | 5. Use industrial tools, materials, equipment, and processes to design and produce products addressing given technological problems. |
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(Safety)

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| 6. Use appropriate tools, materials, equipment, and processes in a safe manner to design a technological solution to a given problem. | 6. Show/demonstrate the appropriate use of tools, materials, equipment, and processes in a safe manner to design a technological solution to a given problem. | 6. Forecast potential hazards, establish guidelines for safe behavior, and demonstrate the understanding for common safety practices in a technological environment. | 6. Investigate, analyze, and assess potential safety hazards, establish guidelines for safe behavior, and adhere to common safety practices while around or participating in the technological solution to a problem. |
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(Systematic Approach)

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| 7. Identify the components (input, process, output, feedback) and follow a basic systematic approach (process folio) to design technological solutions to a given problem. | 7. Demonstrate a basic systematic approach to design a technological solution to a given problem using a process folio. | 7. Apply a systematic approach to identify a current societal need that requires technologies, determine and assess solutions, select the best solution, develop the product, process, or service that meets the need, and evaluate. | 7. Apply a systematic approach to design solutions to technological problems using investigation, analysis and idea development, proposals, planning, making a prototype of the solution, testing and evaluation of the prototype, and self assessment. |
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(Technological Products & Systems)

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| 8. Create a simple quality prototype using appropriate tools, materials, equipment, and processes to solve a given technological problem. | 8. Design/redesign a quality technological prototype to meet a societal or environmental need. | 8. Design/redesign a quality technological prototype to meet a societal or environmental need using investigation, analysis and idea development, proposals, planning, making a prototype of the solution, testing and evaluation of the prototype, and self assessment. | 8. Adapt solutions to the needs and values of individuals, groups, society, and environment when designing/redesigning problem solutions and creating a quality end product to meet the need. |
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(Resources)

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| 9. Identify how resources and processes are used to help people in society accomplish tasks to achieve a technological solution to a problem. | 9. Demonstrate how the appropriate use of resources and processes affect the environment and societal needs to achieve a technological solution to a problem. | 9. Compare and contrast different resources and processes to evaluate technological solutions to a problem. | 9. Analyze resources and processes to choose the best combination to create a technological solution to a problem. |
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APPLYING STANDARDS

Content Standard 5: All students will apply ethical and legal standards in planning, using, and evaluating technology.

Early Elementary	Later Elementary	Middle School	High School
<i>(Planning & Evaluating)</i>			
1. Practice ethical and legal standards related to technology in the home and at school (e.g. follow classroom rules, respect personal property, etc).	1. Explain the need for laws and regulations related to technologies (e.g. safety, proper care and use tools, etc).	1. Hypothesize legal and ethical factors in the design and development of a new product (patents, copyright).	1. Analyze and interpret the impacts of differing ethical and legal standards in the age of global competitiveness. 2. Explain the associated rights and responsibilities of applying for legal documents (e.g., patents, copyrights).
<i>(Planning & Using)</i>			
2. Recognize legal authority in situations involving technology and the well being of others.	2. Identify legal and ethical problems resulting from technological achievements.	2. Provide examples of situations where the use of technology might be affected by legal or ethical considerations.	3. Establish an action plan to solve a technology related problem and assess the plan applying ethical and legal principles.

(Using & Evaluating)

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| 3. Participate in the creation of a rule related to technology and explain its impact on others. | 3. Adhere to copyright, patent, freedom of information, state and federal laws as related to the uses of technology. | 3. Follow established guidelines and laws of privacy and ownership related to technology. | 4. Analyze current and emerging issues (e.g., ethical, social, environmental, legal, political, privacy) related to technology. |
| | | | 5. Identify and evaluate solutions for solving the ethical problems associated with using tools, equipment, materials, and processes in a technological problem. |
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(Using)

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| 4. Explain how individuals are responsible for their technology related actions and decisions. | 4. Practice ethical and legal selection and use of technological resources. | 4. Understand and practice ethical and legal standards for technologies. | 6. Understand and practice the concept of lifelong learning about technology within an ethical/legal context. |
| | | | 7. Analyze the extent to which organizational purposes and actions are compatible with personal standards in the effective and appropriate use of technology. |
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EVALUATING AND FORECASTING

Content Standard 6: All students will evaluate the societal and environmental impacts of technology and forecast alternative uses and possible consequences to make informed civic, social, and economic decisions.

Early Elementary	Later Elementary	Middle School	High School
<i>(Economic)</i>			
1. Describe how a technology could be used in a career or occupation.	1. Demonstrate how people in different occupations and careers use technology to do their work.	1. Investigate the effects of the growth and development of technology on careers and occupations. 2. Analyze present and future job markets in specific technology related careers and occupations.	1. Evaluate current uses of technology on one's personal career and occupational goals. 2. Analyze and forecast the effects of technology on one's personal career and occupational goals.
<i>(Civic / Social)</i>			
2. Give examples of the effects of technology on life in the past and present.	2. Forecast the possible effects technology could have on our society.	3. Compare and contrast how technological development affects and impacts different groups, communities, and cultures in our society.	3. Evaluate the direct and indirect effects and impacts of technological developments on national and international issues.
<i>(Social)</i>			
3. Compare and contrast individuals' experiences and decisions about technology.	3. Show examples of how technology affects and impacts one's current life.	4. Identify, compare, and contrast technological impacts and the effects they could have on one's current and future life.	4. Forecast the impact of technology on individuals in our future society, based on present trends.

(Civic / Social / Economic)

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| 4. Identify the advantages and disadvantages from the application of a technology to a civic, economic, or societal problem. | 4. Identify the advantages and disadvantages from the application of a technology to a civic, economic, or societal problem. | 5. Illustrate the social, environmental, civic, and economic consequences of a particular technology. | 5. Propose guidelines for appropriate and effective use of technology in our society as a whole or in a specific sector of society. |
| | | 6. Provide examples of technological solutions that have led to social, civic, economic, or environmental problems and propose methods for addressing these problems. | 6. Formulate a position and support it about the roles of the government and private sector in creating and influencing policy concerning the use of technology. |
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(Civic / Social)

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| 5. List and describe safe and unsafe aspects of technology in relation to oneself and others. | 5. Classify and discuss the safe and unsafe factors of technological applications as they apply in the home, school, community, and/or the workplace. | 7. Investigate current technological applications and present possible safe and unsafe consequences in the continued use of these applications. | 7. Frame and support a position confirming that a technological application is safe and appropriate for individuals and society in general. |
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(Civic / Social)

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| 6. Identify how technology has impacted the environment. | 6. Describe how technological advances have impacted society and the environment. | 8. Identify and explain how environmental factors contribute to the development of technology and their impacts on society. | 8. Identify and explain how environmental factors contribute to the development of technology and their impacts on society. |
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(Social)

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| 7. Recognize and explain the historical impact of technological solutions to problems and societal needs. | 9. Recognize the historical impact on the development of technology in relationship to the production of tools, equipment, and products. | 9. Assess the historical development of technology regarding the production of tools, equipment, and products in relationship to current societal and environmental needs. |
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(Civic / Social / Economic)

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| 7. Study and predict the consequences of the development of a new technology. | 8. Research and predict the consequences of the development of a new technology. | 10. Research, present, and defend forecasts of consequences of new technological developments. | 10. Propose, research, and justify the introduction of new technologies. |
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