



STATE OF MICHIGAN  
DEPARTMENT OF EDUCATION  
LANSING



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TO: State Board of Education

FROM: Mike Flanagan, Chairman 

SUBJECT: Approval of Michigan Educational Technology Standards  
and Expectations for Grades 9-12

It is a goal of Congress, as stated in Title II, Part D (Enhancing Education Through Technology) of the No Child Left Behind Act (NCLB) of 2001 that a school will: Assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.

To provide guidance for districts in their quest to meet the NCLB goal, a need exists for the State of Michigan to identify a set of standards to be used as guidelines for planning technology related activities. The new Michigan Technology standards are based on an update of the International Society for Technology in Education (ISTE) National Education Technology Standards for Students (NET-S). Included in the update are references to assistive technology (Goal 1[5] and Goal 3[3]), on-line coursework (Goal 3[1] and Goal 4[1]), emerging technologies (Goal 1[1], Goal 1[2], and Goal 2[2]), and digital citizenship (Goal 2[6] and Goal 1[7]).

At the December 13, 2005 State Board meeting, the Board recommended additions to the Michigan Educational Technology Standards and Expectations (METS) for Grades 9-12, and that we obtain a more thorough field review. In addition to relevant groups throughout the state, such as: the Michigan Association of Intermediate School Administrators (MAISA) Technology Committee; the Regional Educational Media Center (REMC) directors; professional education organizations; and ISD/LEA curriculum and technology directors, we have also sent the 9-12 METS to teacher preparation institutions and organizations, Michigan Business Leaders, and to two national organizations, ISTE and the State Educational Technology Directors Association (SETDA). In addition, it was also suggested that we include the attributes necessary to be a successful online learner. We will include these in our introduction to the 9-12 METS. At this time the Michigan Educational Technology Standards and Expectations for Grades 9-12 are being submitted for approval.

It is recommended that the State Board of Education approve the Michigan Educational Technology Standards and Expectations for Grades 9-12 as attached to the Superintendent's memorandum dated December 21, 2005.

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## **Welcome to Michigan’s Educational Technology Standards & Expectations**

It is a goal of No Child Left Behind that schools will “Assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student’s race, ethnicity, gender, family income, geographic location, or disability.”

The Grade Level Educational Technology Standards and Expectations for 9-12 are aligned with the International Society for Technology in Education’s (ISTE) National Educational Technology Standards for Students (NETS-S). They are meant to provide teachers with an outline of learning expectations and will be used to drive educational technology literacy assessments for the next several years.

The goal is that these Standards and Expectations will ultimately be integrated into the various other content areas and that a supplementary document will be produced offering examples and suggestions on how they could be incorporated within those areas.

### **Technology Literacy**

Technology literacy is the ability to responsibly use appropriate technology to communicate, solve problems, and access, manage, integrate, evaluate, and create information to improve learning in all subject areas and to acquire lifelong knowledge and skills in the 21<sup>st</sup> century. The Standards and Expectations for each grade range are established to designate clearly what students are expected to know by the end of grades two, five, eight, and twelve.

### **Distance Learning**

The State Board of Education has recommended that all students take an on-line course or have an on-line learning experience before graduation. Students must understand that to be successful in an on-line course, you should

- be self-motivated and self-disciplined.
- be committed to the course. On-line courses are at least as time-consuming as face-to-face courses.
- take responsibility for your own learning and plan to be a self-directed learner.
- expect to log on daily for updates, messages and communication among participants.
- anticipate being at the computer for extended amounts of time.
- speak up immediately if you are having technical difficulties or are having problems understanding.
- be ready to participate in classroom discussions, and realize that this involves typing.
- be able to read and follow written directions. At this time, reading is a critical skill in on-line learning.
- be comfortable and competent with instructional technologies, using computers, the Internet, e-mail, office applications, and other applications appropriate to the learning situation.
- be information literate, possessing the skills and knowledge needed to locate, differentiate and evaluate various sources of information, and why, when, and how to use them.

**1) Basic Operations and Concepts – By the end of Grade 12 each student will:**

- 1) discuss emerging technology resources (e.g., podcasting, webcasting, compressed video delivery, online file sharing, graphing calculators, global positioning software)
- 2) identify the capabilities and limitations of emerging communication resources
- 3) understand the importance of both the predictable and unpredictable impacts of technology
- 4) identify changes in hardware and software systems over time and discuss how these changes might affect them personally in their role of a lifelong learner
- 5) understand the purpose, scope, and use of assistive technology
- 6) understand that access to online learning increases educational opportunities
- 7) be provided with the opportunity to learn in a virtual environment as a strategy to build 21<sup>st</sup> Century learning skills
- 8) understand the relationship between electronic resources, infrastructure, and connectivity
- 9) routinely apply touch-typing techniques with advanced accuracy, speed, and efficiency
- 10) assess and solve hardware and software problems by using online help or other user documentation and support
- 11) identify common graphic, audio, and video file formats (e.g., jpeg, gif, bmp, mpeg, wav)
- 12) demonstrate how to import/export text, graphics, or audio files
- 13) proofread and edit a document using an application's spelling and grammar checking functions

**2) Social, ethical, and human issues – By the end of Grade 12 each student will:**

- 1) identify legal and ethical issues related to use of information and communication technology
- 2) analyze current trends in information and communication technology and assess the potential of emerging technologies for ethical and unethical uses
- 3) discuss possible long-range effects of unethical uses of technology (e.g., virus spreading, file pirating, hacking) on cultures and society
- 4) discuss the possible consequences and costs of unethical uses of information and computer technology
- 5) identify ways that individuals can protect their technology systems from unethical or unscrupulous users
- 6) demonstrate the ethical use of technology as a digital citizen and lifelong learner
- 7) explain the differences between freeware, shareware, and commercial software
- 8) adhere to fair use and copyright guidelines
- 9) create appropriate citations for resources when presenting research findings
- 10) adhere to the district acceptable use policy as well as state or federal laws
- 11) explore career opportunities and identify their related technology skill requirements
- 12) design and implement a personal learning plan that includes technology to support his/her lifelong learning goals

**3) Technology productivity tools – By the end of Grade 12 each student will:**

- 1) complete at least one on-line credit, or non-credit, course or on-line learning experience
- 2) use technology tools for managing and communicating personal information (e.g., finances, contact information, schedules, purchases, correspondence)
- 3) have access to and utilize assistive technology tools
- 4) apply advanced software features such as an application's built-in thesaurus, templates and styles to improve the appearance of word processing documents, spreadsheets, and presentations
- 5) identify technology tools (e.g., authoring tools or other hardware and software resources) that could be used to create a group project
- 6) use an online tutorial and discuss the benefits and disadvantages of this method of learning
- 7) develop a document or file for inclusion into a web site or web page
- 8) use a variety of applications to plan, create, and edit a multimedia product (e.g., model, webcast, presentation, publication, or other creative work)
- 9) have the opportunity to participate in real-life experiences associated with technology-related careers

- 4) Technology communications tools – By the end of Grade 12 each student will:**
- 1) identify and describe various telecommunications or online technologies (e.g., desktop conferencing, listservs, blogs, virtual reality)
  - 2) use available technologies (e.g., desktop conferencing, e-mail, groupware, instant-messaging) to communicate with others on a class assignment or project
  - 3) use a variety of media and formats to design, develop, publish, and present products (e.g., presentations, newsletters, web sites) to communicate original ideas to multiple audiences
  - 4) collaborate in content-related projects that integrate a variety of media (e.g., print, audio, video, graphic, simulations, and models) with presentation, word processing, publishing, database, graphics design, or spreadsheet applications
  - 5) plan and implement a collaborative project using telecommunications tools (e.g., groupware, interactive web sites, videoconferencing)
- 5) Technology research tools – By the end of Grade 12 each student will:**
- 1) compare, evaluate, and select appropriate internet search engines to locate information
  - 2) formulate and use evaluation criteria (authority, accuracy, relevancy, timeliness) for information located on the internet to present research findings
  - 3) determine if online sources are authoritative, valid, reliable, relevant, and comprehensive
  - 4) distinguish between fact, opinion, point of view, and inference
  - 5) evaluate resources for stereotyping, prejudice, and misrepresentation
  - 6) develop a plan to gather information using various research strategies (e.g., interviews, questionnaires, experiments, online surveys)
- 6) Technology problem-solving and decision-making tools – By the end of Grade 12 each student will:**
- 1) use a variety of technology resources (e.g., educational software, simulations, models) for problem solving and independent learning
  - 2) describe the possible integration of two or more information and communication technology tools or resources to collaborate with peers, community members, and field experts
  - 3) formulate a research question or hypothesis, then use appropriate information and communication technology resources to collect relevant information, analyze the findings, and report the results to multiple audiences