STATE OF MICHIGAN
DEPARTMENT OF EDUCATION
LANSING

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TO: State Board of Education

FROM: Jeremy Hughes, Ph.D., Chairman

SUBJECT: Michigan Technology Standards for Students

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. In 1998, the International Society for Technology in Education (ISTE) released the National Education Technology Standards for Students (NETS-S). In addition to the NETS for students, ISTE has also released standards for both teachers (NETS-T) and administrators (TSSA). Today, nearly every state has adopted, aligned, or referenced the ISTE National Educational Technology Standards in its state technology plan (Attachment A).

Districts throughout Michigan have been using the ISTE NETS-S for several years. Attached is a description of the ISTE NETS-S, which includes a listing of benchmarks for grades K-8. A draft version of this document, with requests for feedback, has been informally presented to various technology groups throughout the state over the past three months (Attachment B).

In order to solicit additional comments and buy-in from our stakeholders, these standards and benchmarks will be presented 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.

After statewide input has been received, staff will ask the State Board of Education to formally adopt the standards and grade span benchmarks.

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Use of NETS by State

National Educational Technology Standards (NETS) and the States

The *NETS for Students* were released in June 1998, *NETS for Teachers* in June 2000, and *NETS for Administrators (TSSA)* in November 2001. At the state level, 49 of the 51 states have adopted, adapted, aligned with, or otherwise referenced at least one set of standards in their state technology plans, certification, licensure, curriculum plans, assessment plans, or other official state documents. States that have adopted, adapted, aligned with, or referenced the NETS in state department of education documents are listed below. *Updated: May 19, 2004*

STU	TCH	ADM	STATE	STU	TCH	ADM	STATE
(A=adopted, adapted, or aligned with; R=referenced)				(A=adopted, adapted, or aligned with; R=referenced)			
A	A	A	Alabama	A	A	A	Nebraska
R	R	R	Alaska		A		Nevada
A	A	A	Arizona	R	A	A	New Hampshire
A	A	A	Arkansas	A	A	A	New Jersey
		R	California		A		New Mexico
A	A		Colorado	A	A	A	New York
A	A	A	Connecticut	A	A		North Carolina
A	A	A	Delaware	A		A	North Dakota
	A		District of Columbia	A		A	Ohio
A	A		Florida	A			Oklahoma
	A	A	Georgia	A		A	Oregon
A			Hawaii			A	Pennsylvania
	A		Idaho	A			Rhode Island
A	A	A	Illinois	A	A		South Carolina
	R	R	Indiana		A	A	South Dakota
A	A	A	Kansas		A	R	Tennessee
A	A	A	Kentucky	R	A	R	Texas
A	A	A	Louisiana	A			Utah
		R	Maine	A	A	A	Vermont
R	A	A	Maryland	A	R	R	Virginia
A	A		Massachusetts	A	A	A	Washington
A	A	A	Michigan	A	A	A	West Virginia
A	A	A	Minnesota	A		A	Wisconsin
A	A	A	Mississippi			A	Wyoming
A	A	A	Missouri				

Standards (from ISTE NETS-S)	PK-2 (By the end of Grade 2)	Grades 3-5 (By the end of Grade 5)	Grades 6-8 (By the end of Grade 8)	Grades 9-12 (By the end of Grade 12)
1. Basic Operations and Concepts - **a. Students demonstrate a sound understanding of the nature and operation of technology systems.**	**1)** Students recognize, name, and can label the major hardware components in a computer system (e.g. computer, monitor, keyboard, mouse, and printer). **2)** Students identify the functions and care of the major hardware components in a computer system. **3)** Students identify common uses of technology found in daily life. **4)** Students identify simple functions represented by symbols and icons commonly found in application programs (e.g. font, size, bold, alignment, color). **5)** Students discuss basic care for computer hardware and various media types (e.g. diskettes, CDs, DVDs, videotapes). **6)** Students know that all people use technology in their daily tasks.	**1)** Students know how to use basic input and output devices; access network resources (e.g. printers, servers); and use various peripherals (e.g. scanners, digital cameras, video projectors). **2)** Students recognize and discuss ways technology has changed life at school and at home. **3)** Students recognize and discuss ways technology has changed business and government over the years. **4)** Students identify characteristics that suggest that the computer system hardware or software needs to be upgraded. **5)** Students recognize and discuss the need for security applications (e.g. virus detection, spam defense, popup blockers, firewalls) to protect information and to keep the system functioning properly.	**1)** Students discuss common hardware and software difficulties and identify strategies for trouble-shooting and problem solving. **2)** Students describe strategies for identifying, and preventing routine hardware and software problems that may occur during everyday technology use. **3)** Students describe a variety of ways that information and technology resources can be combined to develop and promote understanding. **4)** Students identify changes in hardware and software systems over time and discuss how these changes affected various groups (e.g. individual users, education, government, and businesses). **5)** Students understand that new technology tools can be developed to do what could not be done without the use of technology.	

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b. Students are proficient in the use of technology.	**1)** Students are aware of correct finger positions on the keyboard. **2)** Students recognize functions of basic file menu commands (e.g. new, open, close, save, print). **3)** Students use personal folders to manage computer files. **4)** Students use a variety of age-appropriate technologies for sharing information (e.g. drawing a picture, writing a story, creating a simple slide show). **5)** Students use various age-appropriate technologies for gathering information (e.g. dictionaries, encyclopedias, web resources).	**1)** Students know proper keyboarding positions and touch-typing techniques. **2)** Students demonstrate proper care in the use of the computer system, hardware, software, peripherals, and storage media. **3)** Students manage and maintain their own files on a hard drive or the network. **4)** Students know how to exchange files with other students using technology (e.g. e-mail attachments, network file sharing, diskettes, flash drives). **5)** Students identify software used for information management and know which types of software can be used most effectively for different types of data, for different information needs, and for conveying results to different audiences. **6)** Students identify search strategies for locating needed information. **7)** Students identify resources that contribute to solving a specified problem.	**1)** Students use proper keyboarding posture, finger positions , and touch-typing techniques to improve accuracy, speed, and general efficiency in computer operation. **2)** Students can identify appropriate file formats for a variety of applications. **3)** Students can use basic utility programs or built-in application functions to convert file formats, as necessary. **4)** Students use a variety of technology tools (e.g. dictionary, thesaurus, grammar-checker, calculator) to maximize the accuracy of technology-produced products. **5)** Students identify a variety of information storage devices (e.g. floppies, CDs, DVDs, flash drives, tapes) and provide rationales for using a certain device for a specific purpose (very large file, portability, permanent storage). **6)** Students use accurate terminology and select appropriate technology tools and resources to accomplish a variety of tasks.	

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			7) Students identify resources that assist with various consumer related activities (e.g. purchases, banking transactions, product descriptions). **8)** Students discuss security issues related to e-commerce.	
2. Social, ethical, and human issues **a. Students understand the ethical, cultural, and societal issues related to technology.**	**1)** Students identify common uses of information and communication technologies. **2)** Students discuss advantages and disadvantages of using technology.	**1)** Students identify cultural, and societal issues relating to technology. **2)** Students identify issues relating to how information and communication technology supports collaboration, productivity, and lifelong learning. **3)** Students understand and discuss how various assistive technologies can benefit individuals with disabilities. **4)** Students discuss the accuracy, relevance, appropriateness, and bias of electronic information sources.		

Standards (from ISTE NETS-S)	PK-2 (By the end of Grade 2)	Grades 3-5 (By the end of Grade 5)	Grades 6-8 (By the end of Grade 8)	Grades 9-12 (By the end of Grade 12)
b. Students practice responsible use of technology systems, information, and software.	**1)** Students recognize that using a password protects the privacy of information. **2)** Students discuss scenarios describing acceptable and unacceptable uses of age-appropriate technology (e.g. computers, internet, email) and describe consequences of inappropriate use. **3)** Students describe appropriate and inappropriate uses of technology in the classroom. **4)** Students describe the consequences of irresponsible use of technology resources at home and at school.	**1)** Students discuss scenarios describing acceptable and unacceptable uses of technology (e.g. computers, digital cameras, cell-phones, PDAs, wireless connectivity) and describe consequences of inappropriate use. **2)** Students discuss basic issues regarding appropriate and inappropriate uses of technology (e.g. copyright, privacy, file sharing, spam, viruses, plagiarism) and related laws. **3)** Students discuss appropriate kinds of information that should be shared in public "chat rooms".	**1)** Students provide accurate citations when referencing information from outside sources. **2)** Students discuss issues related to acceptable and responsible use of technology (e.g. privacy, security, copyright, plagiarism, spam, viruses, file-sharing). **3)** Students discuss the consequences and costs related to unethical use of information and communication technology.	
c. Students develop positive attitudes toward technology uses that support lifelong learning, collaboration, personal pursuits, and productivity.	**1)** Students understand that technology is a tool to help them complete a task, and is a source of information, learning and entertainment. **2)** Students identify places in the community where one can access technology.	**1)** Students identify software or technology-delivered access that is valuable to them, and describe how it improves their ability to communicate, be productive, or achieve personal goals. **2)** Students identify their personal goals or pursuits and explore technology resources that may assist them in identifying paths leading to their goals or pursuits.	**1)** Students use technology to identify and explore various occupations or careers. **2)** Students discuss possible uses of technology (present and future) to support personal pursuits and lifelong learning. **3)** Students identify effective uses of technology to support effective communication with peers, family, or school personnel.	

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			4) Students discuss possible societal impact of technology in the future.	
3. Technology productivity tools **a. Students use technology tools to enhance learning, increase productivity, and promote creativity.**	**1)** Students know how to use a variety of productivity software (e.g. word processors, drawing tools, presentation software) to convey ideas and illustrate concepts. **2)** Students identify the best type of productivity software to use for a certain age-appropriate tasks (e.g. word-processor, drawing, browser).	**1)** Students know how to use menu options in applications to print, format, add multimedia features; open, save, manage files; and use various grammar tools (e.g. dictionary, thesaurus, spell-checker). **2)** Students know how to insert various objects (e.g. photos, graphics, sound, video) into word-processing documents, presentations, or web documents. **3)** Students use a variety of technology tools and applications to promote their creativity. **4)** Students understand that existing (and future) technologies are the result of human creativity.	**1)** Students apply common software features (e.g. spellchecker, thesaurus, formulas, charts, graphics, sounds) to enhance communication to an audience and to support creativity. **2)** Students use a variety of resources, including the internet, to enhance learning and increase productivity. **3)** Students explore basic applications that promote creativity (e.g. graphics, presentation, photo-editing, programming, video-editing). **4)** Students use available utilities for editing pictures, images, or charts.	
b. Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.	**1)** Students are aware of how to work together when using technology tools (e.g. word processor, drawing, presentation software) to convey ideas or illustrate simple concepts relating to a specified project.	**1)** Students collaborate with classmates using a variety of technology tools to plan, organize, and create a group project.	**1)** Students describe how to use online environments or other collaborative tools to design, develop, and enhance materials, publications, or presentations.	

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4. Technology communications tools **a. Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.**	**1)** Students, with assistance from teacher, parents, or student partners, identify procedures for safely using basic telecommunication tools (e.g. e-mail, IM) to read or send electronic information.	**1)** Students use basic telecommunication tools (e.g. e-mail, WebQuests, IM, chat rooms, web conferencing) and online resources for collaborative projects with other students.	**1)** Students use a variety of telecommunication tools (e.g. e-mail, discussion groups, IM, chat rooms, blogs, video-conferences, web conferences) and online resources to collaborate interactively with peers, experts, and other audiences.	
b. Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.	**1)** Students know how to use a variety of age-appropriate media (e.g. presentation software, newsletters, word processors) to communicate ideas to classmates, families, and others. **2)** Students, assisted by teachers, parents, or student partners, know how to select media formats (e.g. text, graphics, photos, video) to communicate and share ideas to classmates, families, and others.	**1)** Students use a variety of media and formats to create and edit products (e.g. presentations, newsletters, brochures, web pages) to communicate information and ideas to various audiences. **2)** Students identify how different forms of media and formats may be used to share similar information, depending on the intended audience (e.g. presentations for classmates, newsletters for parents).	**1)** Students create a project (e.g. presentation, web page, newsletter, information brochure) using a variety of media and formats (e.g. graphs, charts, audio, graphics, video) to present content information to an audience.	
5. Technology research tools **a. Students use technology to locate, evaluate, and collect information from a variety of sources.**	**1)** Students know how to recognize the Web browser and associate it with accessing resources on the internet.	**1)** Students use Web search engines and built-in search functions of other various resources to locate information.	**1)** Students use a variety of Web search engines to locate information. **2)** Students effectively evaluate information from various online resources for accuracy, bias, appropriateness, and comprehensiveness.	

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	2) Students, assisted by teachers, parents, or student parents, identify steps for using technology resources (e.g. CD-ROMs, DVDs, search engines, websites) to locate information relating to a specific curricular topic.	**2)** Students describe basic guidelines for determining the validity of information accessed from various sources (e.g. web site, dictionary, on-line newspaper, CD-ROM).	**3)** Students can identify types of internet sites based on their domain names (e.g. edu, com, org, net, gov, au)	
b. Students use technology tools to process data and report results.	**1)** Students, assisted by teachers, parents, or student parents, know how to use existing electronic databases (e.g. dictionaries, encyclopedias, spreadsheets) to locate and interpret information.	**1)** Students know how to independently use existing databases (e.g. library catalogs, electronic dictionaries, encyclopedias) to locate, sort, and interpret information on an assigned topic. **2)** Students perform simple queries on existing databases and report results on an assigned topic.	**1)** Students know how to create and populate a database. **2)** Students perform queries on existing databases. **3)** Students know how to create, and modify a simple database report.	
c. Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.	**1)** Students provide a rationale for choosing one type of hardware or software over another for completing a specific assigned task.	**1)** Students identify appropriate technology tools and resources by evaluating the accuracy, appropriateness, and bias of the resource. **2)** Students compare and contrast the functions and capabilities of the word processor, database, and spreadsheet for gathering data, processing data, performing calculations, and reporting results.	**1)** Students evaluate new technology tools and resources, and select the most appropriate tool to use for accomplishing a specific task.	

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6. Technology problem-solving and decision-making tools **a. Students use technology resources for solving problems and making informed decisions.**	**1)** Students know how to use technology resources (e.g. dictionaries, encyclopedias, search engines, websites) to solve age-appropriate problems.	**1)** Students use technology resources to access information that can assist them in making informed decisions about everyday matters (e.g. which movie to see, which product to purchase, perform "how-to" tasks).	**1)** Students use database or spreadsheet information to make predictions, develop strategies, and evaluate decisions to assist them with solving a basic problem. **2)** Students identify technology resources that can be used to: solve a specific problem; assist them with making an informed decision; and allow them to present the result.	
b. Students employ technology in the development of strategies for solving problems in the real world.	**1)** Students identify ways that technology has been used to address real-world problems.	**1)** Students use information and communication technology tools (e.g. calculators, probes, videos, DVDs, educational software) to collect, organize, and evaluate information to assist them with solving real-life problems.	**1)** Students describe the information and communication technology tools they might use to collect information from different sources, compare the data, analyze their findings, and draw conclusions for addressing real-world problems.	