Michigan Educational Technology Standards for Students (METS-S) 2009 – PK-12 Alignment with NETS 2007 and the 21st Century Framework

Grades PK through 2 –Technology Standards and Expectations – (prior to completing Grade 2)

PK-2.CI. Creativity and Innovation - By the end of Grade 2 each student will:	NETS 2007	21st Century
1. use a variety of digital tools (e.g., word processors, drawing tools, simulations, presentation software, graphical organizers) to learn, create, and convey original ideas or illustrate concepts	1. Creativity/Innov. 2. Comm./Collab. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
PK-2.CC. Communication and Collaboration - By the end of Grade 2 each student will:	**NETS 2007**	**21st Century**
1. work together when using digital tools (e.g., word processor, drawing, presentation software) to convey ideas or illustrate simple concepts relating to a specified project	2. Comm./Collab. 6. Oper./Concepts	L, I Skills
2. use a variety of developmentally appropriate digital tools (e.g., word processors, paint programs) to communicate ideas to classmates, families, and others	2. Comm./Collab. 6. Oper./Concepts	L, I Skills C S, 21st Cent.
PK-2.RI. Research and Information Fluency - By the end of Grade 2 each student will:	**NETS 2007**	**21st Century**
1. interact with Internet based resources	3. Res./Info. Lit. 6. Oper./Concepts	I, M, T Skills C S, 21st Cent.
2. use digital resources (e.g., dictionaries, encyclopedias, graphs, graphical organizers) to locate and interpret information relating to a specific curricular topic, with assistance from teachers, school library media specialists, parents, or student partners	3. Res./Info. Lit. 6. Oper./Concepts	I, M, T Skills C S, 21st Cent.
PK-2.CT. Critical Thinking, Problem Solving, and Decision Making - By the end of Grade 2 each student will:	**NETS 2007**	**21st Century**
1. explain ways that technology can be used to solve problems (e.g., cell phones, traffic lights, GPS units)	4. CT, PS, DM 6. Oper./Concepts	L, I Skills
2. use digital resources (e.g., dictionaries, encyclopedias, search engines, web sites) to solve developmentally appropriate problems, with assistance from teachers, parents, school media specialists, or student partners	4. CT, PS, DM 6. Oper./Concepts	L, I Skills

PK-2.DC. Digital Citizenship - By the end of Grade 2 each student will:	NETS 2007	21st Century
1. describe appropriate and inappropriate uses of technology (e.g., computers, Internet, e-mail, cell phones) and describe consequences of inappropriate uses	5. Digital Citizens. Internet Safety	C S, 21st Cent.
2. know the Michigan Cyber Safety Initiative's three rules (Keep Safe, Keep Away, Keep Telling)	Internet Safety	I, M, T Skills
3. identify personal information that should not be shared on the Internet (e.g. name, address, phone number)	Internet Safety	I, M, T Skills
4. know to inform a trusted adult if he/she receives or views an online communication which makes him/her feel uncomfortable, or if someone whom he/she doesn't know is trying to communicate with him/her or asking for personal information	5. Digital Citizens. Internet Safety	I, M, T Skills
PK-2.TC. Technology Operations and Concepts - By the end of Grade 2 each student will:	NETS 2007	21st Century
1. discuss advantages and disadvantages of using technology	6. Oper./Concepts	I, M, T Skills
2. be able to use basic menu commands to perform common operations (e.g., open, close, save, print)	6. Oper./Concepts	I, M, T Skills
3. recognize and name the major hardware components in a computer system (e.g., computer, monitor, keyboard, mouse, printer)	6. Oper./Concepts	I, M, T Skills
4. discuss the basic care for computer hardware and various media types (e.g., CDs, DVDs)	6. Oper./Concepts	I, M, T Skills
5. use developmentally appropriate and accurate terminology when talking about technology	6. Oper./Concepts	I, M, T Skills
6. understand that technology is a tool to help him/her complete a task, and is a source of information, learning, and entertainment	6. Oper./Concepts	I, M, T Skills
7. demonstrate the ability to navigate in virtual environments (e.g., electronic books, games, simulation software, web sites)	6. Oper./Concepts	I, M, T Skills

Michigan Educational Technology Standards for Students (METS-S) 2009 – PK-12 Alignment with NETS 2007 and the 21st Century Framework

Grades Three through Five – Technology Standards and Expectations – (prior to completing Grade 5)

3-5.CI. Creativity and Innovation - By the end of Grade 5 each student will:	NETS 2007	21st Century
1. produce a media-rich digital project aligned to state curriculum standards (e.g., fable, folk tale, mystery, tall tale, historical fiction)	1. Creativity/Innov. 3. Res./Info. Lit. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
2. use a variety of technology tools and applications to demonstrate his/her creativity by creating or modifying works of art, music, movies, or presentations	1. Creativity/Innov. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
3. participate in discussions about technologies (past, present, and future) to understand these technologies are the result of human creativity	1. Creativity/Innov. 2. Comm./Collab.	L, I Skills
3-5.CC. Communication and Collaboration - By the end of Grade 5 each student will:	**NETS 2007**	**21st Century**
1. use digital communication tools (e.g., e-mail, wikis, blogs, IM, chat rooms, videoconferencing, Moodle, Blackboard) and online resources for group learning projects	2. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
2. identify how different software applications may be used to share similar information, based on the intended audience (e.g., presentations for classmates, newsletters for parents)	2. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
3. 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. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
3-5.RI. Research and Information Fluency - By the end of Grade 5 each student will:	**NETS 2007**	**21st Century**
1. identify search strategies for locating information with support from teachers or school library media specialists	3. Res./Info. Lit.	L, C Skills I, M, T Skills
2. use digital tools to find, organize, analyze, synthesize, and evaluate information	3. Res./Info. Lit. 6. Oper./Concepts	L, C Skills I, M, T Skills
3. understand and discuss that web sites and digital resources may contain inaccurate or biased information	3. Res./Info. Lit. 6. Oper./Concepts	L, C Skills I, M, T Skills
4. understand that using information from a single Internet source might result in the reporting of erroneous facts and that multiple sources should always be researched	3. Res./Info. Lit. 6. Oper./Concepts	L, C Skills I, M, T Skills

3-5.CT. Critical Thinking, Problem Solving, and Decision Making - By the end of Grade 5 each student will:	NETS 2007	21st Century
1. use digital resources to access information that can assist in making informed decisions about everyday matters (e.g., which movie to see, which product to purchase)	4. CT, PS, DM 6. Oper./Concepts	L, I Skills I, M, T Skills
2. use information and communication technology tools (e.g., calculators, probes, videos, DVDs, educational software) to collect, organize, and evaluate information to assist with solving problems	4. CT, PS, DM 6. Oper./Concepts	L, I Skills I, M, T Skills
3. use digital resources to identify and investigate a state, national, or global issue (e.g., global warming, economy, environment)	4. CT, PS, DM 6. Oper./Concepts	L, I Skills I, M, T Skills
3-5.DC. Digital Citizenship - By the end of Grade 5 each student will:	**NETS 2007**	**21st Century**
1. discuss scenarios involving acceptable and unacceptable uses of technology (e.g., file-sharing, social networking, text messaging, cyber bullying, plagiarism)	5. Digital Citizens.	I, M, T Skills
2. recognize issues involving ethical use of information (e.g., copyright adherence, source citation)	5. Digital Citizens.	L, C Skills I, M, T Skills
3. describe precautions surrounding personal safety that should be taken when online	5. Digital Citizens. Internet Safety	I, M, T Skills
4. identify the types of personal information that should not be given out on the Internet (name, address, phone number, picture, school name)	5. Digital Citizens. Internet Safety	I, M, T Skills
3-5.TC. Technology Operations and Concepts - By the end of Grade 5 each student will:	**NETS 2007**	**21st Century**
1. use basic input and output devices (e.g., printers, scanners, digital cameras, video recorders, projectors)	6. Oper./Concepts	I, M, T Skills
2. describe ways technology has changed life at school and at home	6. Oper./Concepts	L, C Skills I, M, T Skills
3. understand and discuss how assistive technologies can benefit all individuals	6. Oper./Concepts	L, C Skills I, M, T Skills
4. demonstrate proper care in the use of computer hardware, software, peripherals, and storage media	6. Oper./Concepts	I, M, T Skills
5. know how to exchange files with other students using technology (e.g., network file sharing, flash drives)	6. Oper./Concepts	I, M, T Skills

Michigan Educational Technology Standards for Students (METS-S) 2009 – PK-12 Alignment with NETS 2007 and the 21st Century Framework

Grades Six through Eight – Technology Standards and Expectations – (prior to completing Grade 8)

6-8.CI. Creativity and Innovation – By the end of Grade 8 each student will:	NETS 2007	21st Century
1. apply common software features (e.g., spellchecker, thesaurus, formulas, charts, graphics, sounds) to enhance communication with an audience and to support creativity	1. Creativity/Innov. 2. Comm./Collab. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
2. create an original project (e.g., presentation, web page, newsletter, information brochure) using a variety of media (e.g., animations, graphs, charts, audio, graphics, video) to present content information to an audience	1. Creativity/Innov. 2. Comm./Collab. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
3. illustrate a content-related concept using a model, simulation, or concept-mapping software	1. Creativity/Innov. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
6-8.CC. Communication and Collaboration – By the end of Grade 8 each student will:	NETS 2007	21st Century
1. use digital resources (e.g., discussion groups, blogs, podcasts, videoconferences, Moodle, Blackboard) to collaborate with peers, experts, and other audiences	2. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
2. use collaborative digital tools to explore common curriculum content with learners from other cultures	2. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
3. identify effective uses of technology to support communication with peers, family, or school personnel	2. Comm./Collab. 6. Oper./Concepts	L, I Skills I, M, T Skills
6-8.RI. Research and Information Fluency – By the end of Grade 8 each student will:	NETS 2007	21st Century
1. use a variety of digital resources to locate information	3. Res./Info. Lit. 6. Oper./Concepts	L, C Skills I, M, T Skills
2. evaluate information from online information resources for accuracy and bias	3. Res./Info. Lit. 6. Oper./Concepts	L, I Skills I, M, T Skills
3. understand that using information from a single Internet source might result in the reporting of erroneous facts and that multiple sources should always be researched	3. Res./Info. Lit. 6. Oper./Concepts	L, I Skills I, M, T Skills
4. identify types of web sites based on their domain names (e.g., edu, com, org, gov, net)	3. Res./Info. Lit. 6. Oper./Concepts	I, M, T Skills
5. employ data-collection technologies (e.g., probes, handheld devices, GPS units, geographic mapping systems) to gather, view, and analyze the results for a content-related problem	3. Res./Info. Lit. 6. Oper./Concepts	L, C Skills I, M, T Skills

6-8.CT. Critical Thinking, Problem Solving, and Decision Making - By the end of Grade 8 each student will:	NETS 2007	21st Century
1. use databases or spreadsheets to make predictions, develop strategies, and evaluate decisions to assist with solving a problem	4. CT, PS, DM 6. Oper./Concepts	L, I Skills I, M, T Skills
2. evaluate available digital resources and select the most appropriate application to accomplish a specific task (e, g., word processor, table, outline, spreadsheet, presentation program)	4. CT, PS, DM 6. Oper./Concepts	L, C Skills I, M, T Skills
3. gather data, examine patterns, and apply information for decision making using available digital resources	4. CT, PS, DM 6. Oper./Concepts	L, I Skills I, M, T Skills
4. describe strategies for solving routine hardware and software problems	4. CT, PS, DM 6. Oper./Concepts	I, M, T Skills
6-8.DC. Digital Citizenship – By the end of Grade 8 each student will:	NETS 2007	21st Century
1. provide accurate citations when referencing information sources	5. Digital Citizens.	L, C Skills I, M, T Skills
2. discuss issues related to acceptable and responsible use of technology (e.g., privacy, security, copyright, plagiarism, viruses, file-sharing)	5. Digital Citizens.	I, M, T Skills
3. discuss the consequences related to unethical use of information and communication technologies	5. Digital Citizens.	L, C Skills I, M, T Skills
4. discuss possible societal impact of technology in the future and reflect on the importance of technology in the past	5. Digital Citizens.	L, C Skills I, M, T Skills
5. create media-rich presentations on the appropriate and ethical use of digital tools and resources	5. Digital Citizens. 6. Oper./Concepts	I, M, T Skills
6. discuss the long term ramifications (digital footprint) of participating in questionable online activities (e.g., posting photos of risqué poses or underage drinking, making threats to others)	5. Digital Citizens. **Internet Safety**	C S, 21st Cent. I, M, T Skills
7. describe the potential risks and dangers associated with online communications	5. Digital Citizens. **Internet Safety**	I, M, T Skills

6-8.TC. Technology Operations and Concepts - By the end of Grade 8 each student will:	NETS 2007	21st Century
1. identify file formats for a variety of applications (e.g., doc, xls, pdf, txt, jpg, mp3)	6. Oper./Concepts	I, M, T Skills
2. use a variety of technology tools (e.g., dictionary, thesaurus, grammar-checker, calculator) to maximize the accuracy of technology-produced materials	6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
3. perform queries on existing databases	6. Oper./Concepts	L, C Skills I, M, T Skills
4. know how to create and use various functions available in a database (e.g., filtering, sorting, charts)	6. Oper./Concepts	I, M, T Skills
5. identify a variety of information storage devices (e.g., CDs, DVDs, flash drives, SD cards) and provide rationales for using a certain device for a specific purpose	6. Oper./Concepts	I, M, T Skills
6. use accurate technology terminology	6. Oper./Concepts	I, M, T Skills
7. use technology to identify and explore various occupations or careers, especially those related to science, technology, engineering, and mathematics .	6. Oper./Concepts	L, C Skills I, M, T Skills
8. discuss possible uses of technology to support personal pursuits and lifelong learning	6. Oper./Concepts	L, C Skills I, M, T Skills
9. understand and discuss how assistive technologies can benefit all individuals	6. Oper./Concepts	L, C Skills I, M, T Skills
10. discuss security issues related to e-commerce	6. Oper./Concepts	L, C Skills I, M, T Skills

Michigan Educational Technology Standards for Students (METS-S) 2009 – PK-12 Alignment with NETS 2007 and the 21st Century Framework

Grades Nine through Twelve – Technology Standards and Expectations – (prior to completing grade 12)

9-12.CI. Creativity and Innovation – By the end of Grade 12 each student will:	NETS 2007	21st Century
1. apply advanced software features (e.g. built-in thesaurus, templates, styles) to redesign the appearance of word processing documents, spreadsheets, and presentations	1. Creativity/Innov. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
2. create a web page (e.g., Dreamweaver, iGoogle, Kompozer)	1. Creativity/Innov. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
3. use a variety of media and formats to design, develop, publish, and present projects (e.g., newsletters, web sites, presentations, photo galleries)	1. Creativity/Innov. 2. Comm./Collab. 6. Oper./Concepts	C S, 21st Cent. I, M, T Skills
9-12.CC. Communication and Collaboration - By the end of Grade 12 each student will:	**NETS 2007**	**21st Century**
1. identify various collaboration technologies and describe their use (e.g., desktop conferencing, listserv, blog, wiki)	2. Comm./Collab. 6. Oper./Concepts	L, I Skills
2. use available technologies (e.g., desktop conferencing, e-mail, videoconferencing, instant messaging) to communicate with others on a class assignment or project	2. Comm./Collab. 6. Oper./Concepts	L, I Skills
3. collaborate in content-related projects that integrate a variety of media (e.g., print, audio, video, graphic, simulations, and models)	2. Comm./Collab. 6. Oper./Concepts	L, I Skills
4. plan and implement a collaborative project using telecommunications tools (e.g., ePals, discussion boards, online groups, interactive web sites, videoconferencing)	2. Comm./Collab. 6. Oper./Concepts	L, I Skills
5. describe the potential risks and dangers associated with online communications	2. Comm./Collab. 6. Oper./Concepts	L, I Skills **Internet Safety**
6. use technology tools for managing and communicating personal information (e.g., finances, contact information, schedules, purchases, correspondence)	2. Comm./Collab. 6. Oper./Concepts	L, I Skills

9-12.RI. Research and Information Fluency – By the end of Grade 12 each student will:	NETS 2007	21st Century
1. develop a plan to gather information using various research strategies (e.g., interviews, questionnaires, experiments, online surveys)	3. Res./Info. Lit.	I, M, T Skills C S, 21st Cent.
2. identify, evaluate, and select appropriate online sources to answer content related questions	3. Res./Info. Lit. 6. Oper./Concepts	I, M, T Skills C S, 21st Cent.
3. demonstrate the ability to use library and online databases for accessing information (e.g., MEL, Proquest, Infosource, United Streaming)	3. Res./Info. Lit. 6. Oper./Concepts	I, M, T Skills C S, 21st Cent.
4. distinguish between fact, opinion, point of view, and inference	3. Res./Info. Lit.	I, M, T Skills C S, 21st Cent.
5. evaluate information found in selected online sources on the basis of accuracy and validity	3. Res./Info. Lit.	I, M, T Skills C S, 21st Cent.
6. evaluate resources for stereotyping, prejudice, and misrepresentation	3. Res./Info. Lit.	I, M, T Skills C S, 21st Cent.
7. understand that using information from a single internet source might result in the reporting of erroneous facts and that multiple sources must always be researched	3. Res./Info. Lit.	I, M, T Skills C S, 21st Cent.
8. research examples of inappropriate use of technologies and participate in related classroom activities (e.g., debates, reports, mock trials, presentations)	3. Res./Info. Lit. 2. Comm./Collab 6. Oper./Concepts	I, M, T Skills C S, 21st Cent.

Grades Nine through Twelve – Technology Standards and Expectations – (prior to completing grade 12)		
9-12.CT. Critical Thinking, Problem Solving, and Decision Making - By the end of Grade 12 each student will:	**NETS 2007**	**21st Century**
1. use digital resources (e.g., educational software, simulations, models) for problem solving and independent learning	4. CT, PS, DM 6. Oper./Concepts	L, I Skills
2. analyze the capabilities and limitations of digital resources and evaluate their potential to address personal, social, lifelong learning, and career needs	4. CT, PS, DM 6. Oper./Concepts	L, I Skills
3. devise a research question or hypothesis using information and communication technology resources, analyze the findings to make a decision based on the findings, and report the results	4. CT, PS, DM 2. Comm./Collab 6. Oper./Concepts	L, I Skills
9-12.DC. Digital Citizenship – By the end of Grade 12 each student will:	**NETS 2007**	**21st Century**
1. identify legal and ethical issues related to the use of information and communication technologies (e.g., properly selecting and citing resources)	5. Digital Citizens.	I, M, T Skills
2. discuss possible long-range effects of unethical uses of technology (e.g., virus spreading, file pirating, hacking) on cultures and society	5. Digital Citizens.	I, M, T Skills
3. discuss and demonstrate proper netiquette in online communications	5. Digital Citizens.	I, M, T Skills
4. identify ways that individuals can protect their technology systems from unethical or unscrupulous users	5. Digital Citizens. **Internet Safety**	I, M, T Skills
5. create appropriate citations for resources when presenting research findings	5. Digital Citizens.	I, M, T Skills
6. discuss and adhere to fair use policies and copyright guidelines	5. Digital Citizens.	I, M, T Skills

9-12.TC. Technology Operations and Concepts - By the end of Grade 12 each student will:	NETS 2007	21st Century
1. complete at least one online credit, or non-credit, course or online learning experience	6. Oper./Concepts	I, M, T Skills
2. use an online tutorial and discuss the benefits and disadvantages of this method of learning	6. Oper./Concepts	I, M, T Skills
3. explore career opportunities, especially those related to science, technology, engineering, and mathematics and identify their related technology skill requirements	6. Oper./Concepts	I, M, T Skills
4. describe uses of various existing or emerging technology resources (e.g., podcasting, webcasting, videoconferencing, online file sharing, global positioning software)	6. Oper./Concepts	I, M, T Skills
5. identify an example of an assistive technology and describe its potential purpose and use	6. Oper./Concepts	I, M, T Skills
6. participate in a virtual environment as a strategy to build 21st century learning skills	6. Oper./Concepts	I, M, T Skills
7. assess and solve hardware and software problems by using online help or other user documentation	6. Oper./Concepts	I, M, T Skills
8. explain the differences between freeware, shareware, open source, and commercial software	6. Oper./Concepts	I, M, T Skills
9. participate in experiences associated with technology-related careers	6. Oper./Concepts	I, M, T Skills
10. identify common graphic, audio, and video file formats (e.g., jpeg, gif, bmp, mpeg, wav, wmv, mp3, flv, avi, pdf)	6. Oper./Concepts	I, M, T Skills
11. understand and discuss how assistive technologies can benefit all individuals	6. Oper./Concepts	L, C Skills I, M, T Skills
12. demonstrate how to import/export text, graphics, or audio files	6. Oper./Concepts	I, M, T Skills
13. proofread and edit a document using an application's spelling and grammar checking functions	6. Oper./Concepts	I, M, T Skills

NETS 2007:	Framework for 21st Century Learning:
1. Creativity and Innovation (*Creativity/Innov*)	1. Core Subjects and 21st Century Themes (*C S, 21st Cent.*)
2. Communication and Collaboration (*Comm. / Collab.*)	2. Learning and Innovation Skills (*L, I Skills*)
3. Research and Information Literacy (*Res. / Info. Lit.*)	3. Information, Media, and Technology Skills (*I, M, T Skills*)
4. Critical Thinking, Problem Solving, and Decision Making (*CT, PS, DM*)	4. Life and Career Skills (*L, C Skills*)
5. Digital Citizenship (*Digital Citizens.*)	
6. Technology Operations and Concepts (*Oper. / Concepts*)	

Web Resources:

Each of the ISTE resources are © 2007 International Society for Technology in Education.
ISTE NETS for Students 2007
ISTE NETS for Students 2007 – Profiles for Technology (ICT) Literate Students
ISTE NETS for Students 2007 – Essential Conditions

All of the following resources are © 2004 Partnership for 21st Century Skills.
Framework for 21st Century Learning – The Partnership for 21st Century Skills has developed a vision for 21st century student success in the new global economy.
21st Century Standards
21st Century Assessment
21st Century Curriculum & Instruction
21st Century Professional Development
21st Century Learning Environments