

The Minnesota Educational Media Organization's (MEMO)

Recommended standards for

# Information and Technology Literacy

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## **Introduction and Overview**

Information literacy begins with curiosity about how the world works. The information literate learner observes and listens, categorizing and classifying what is observed, and integrates this information with what is already known. From the initial curiosity, the information literate learner formulates questions and then gathers information from a wide variety of sources that may help answer them. These sources are read (listened to or viewed) and evaluated. Ideas are organized and conclusions drawn. Information literate learners use what they have learned to make a decision or determine an action. The information literacy process also involves communicating what is learned using a variety of media and evaluating both the process used and the product.

The information literate learner integrates technology skills, reading and media literacy skills, and demonstrates an understanding of ethical issues such as plagiarism, copyright, intellectual freedom into this recursive research process.

In order to effectively research a question and defend a conclusion, learners need to understand, not just where and how to find information, but how information is created—how facts and theories come to be accepted by our community—so that they can evaluate the accuracy of the information they find and understand how information supports or transforms ideas.

This document describes the processes and specific skills a learner must understand and practice in order to meet a minimum level of information literacy. These are divided into four general areas:

- **The Research process**

*Rationale:* To be information literate, students need to understand and use a systematic research process that includes a broad understanding of information resources and specific skills woven into a recursive process. Research must be learned through repeated practice, with insight and coaching provided by a knowledgeable educator. The standards described here build on and expand the research and writing standards described in the Minnesota academic standards in language arts and social studies.

- **Technology use**

*Rationale:* Technical skills include the basics of hardware, software, and connectivity. Students need to learn to manipulate various information devices from computers to cameras. They need to understand the basics of file management and how networks function to deliver information to the desktop. They need to understand the functions of application software so that they can select the proper tools to access, organize, or communicate information. Students need to understand the role and effect of technology in the workplace and society.

- **Reading and media literacy**

*Rationale:* The research process requires that students be able to extract information from texts and media, evaluating content for bias and credibility. Students need to understand how to select books and other reading materials at their reading level. Students need to appreciate literature and understand literary conventions. In order ‘see’ how information and emotions are communicated in non-print media, students

need to create media in the language of images and sound.

- **Responsible use of technology and information**

*Rationale:* In order to conduct research, students must learn the laws and practices that protect intellectual property. They must use resources responsibly. They must learn to work independently and in groups to share limited resources with the learning community. They must know how to operate safely and ethically in networked environments, respecting the privacy and property of others as well as protecting their own. They must recognize the inherent dangers in online communications and in not critically evaluating information sources.

Information literacy is most effectively learned by completing relevant assignments or projects throughout the school curriculum. Students will use information literacy throughout their lives-- whether buying a car, developing a new business model, or investigating new theories in astrophysics. Information literacy is learning how to learn.

The following documents were used in developing these standards:

- ISTE (International Society for Technology in Education's National Educational Technology Standards (ISTE NETS)
- American Association of School Librarians (AASL) & American Educational Communication and Technology's (AECT) *Information Power*
- *enGauge 21<sup>st</sup> Century Skills*
- *Student Technology Literacy Proficiency Checklist* (Response to No Child Left Behind , Title II, Part D: Enhancing Education Through Technology by Learning Point Associates, 2003)
- *Big6* research process
- Carol Kuhlthau's information search process
- Mid-Continent Research for Education and Learning's (McREL) *Content Knowledge*
- State information literacy standards recently adopted in Wisconsin, North Dakota, Colorado, Ohio, and Alaska.

Careful attention was given to the Minnesota Content Standards in all subject areas. A few skills are shared with language arts and social studies, but most complement or further define processes mentioned in other standards. Most skills described are unique to these standards.

The implementation of these standards is the primary responsibility of a library media specialist. The design and implementation of instructional strategies, lessons, and projects that incorporate information literacy and technology skills are planned in collaboration with content area teachers to ensure integration with classroom curriculum. These standards complement the program goals outlined in *Minnesota Standards for Library Media Programs*, (2000).

# **FRAMEWORK FOR THE INFORMATION AND TECHNOLOGY LITERACY STANDARDS**

## **Summary of the standards**

### **I. The Research Process**

- A. Standard: The student will follow a systematic research process that involves formulating a question, gathering, evaluating, and organizing information, drawing conclusions, presenting results to an audience, and evaluating both the product and the process.

### **II. Technology use**

- A. Standard: The student will select and use appropriate technology for educational and personal goals.

### **III. Reading and media literacy**

- A. Standard: The student will select and read for educational and personal goals.
- B. Standard: The student will appreciate literature and understand literary conventions.
- C. Standard: The student will critically evaluate films, recordings, and other multimedia formats.
- D. Standard: The student will create video and multimedia productions.

### **IV. Responsible Use of information and technology**

- A. Standard: The student will understand ethical and safety issues related to information use including plagiarism and citing sources, copyright, intellectual freedom, acceptable use of school technologies, privacy, and evaluation of information.
- B. Standard: The student will use resources responsibly.
- C. Standard: The student will use resources and learn independently and in collaboration with others.

## The Standards with benchmarks and examples

### I. The Research Process

**Standard: The student will follow a systematic research process that involves formulating a question, gathering, evaluating, and organizing information, drawing conclusions, presenting results to an audience, and evaluating both the product and the process.**

*Benchmarks for the research process are organized by the steps in the research process: Question, Gather and evaluate, Organize and draw conclusions, Communicate, Evaluate the product and the process.*

#### QUESTION

The student will:

- Recognize when and what information is needed.
- Understand the extent of an issue by conducting preliminary research.
- Revise, add, or delete questions as information needs change.
- Broaden or narrow topic to meet requirements.

*Examples:*

- Brainstorming techniques
- Graphic organizer
- Dialogue/discussion

#### GATHER AND EVALUTE

The student will:

- Identify a wide range of potential sources of information.
- Understand where information is stored (print, static digital (CD, DVDs), dynamic digital (Internet)).
- Search for information using print resources (author, title, subject, and call number)
- Search for information using digital resources (online catalogs and reference databases using author, title, subject and keyword), and the Internet (using simple and advanced features of search engines and directories).
- Understand how to access and retrieve resources from local, regional, state, and national libraries.
- Understand where and how information is created, including an understanding of scientific methods.
- Distinguish between primary and secondary sources.
- Evaluate information sources, considering accuracy, validity, relevance, completeness, bias, intended audience, and purpose.
- Distinguish between fact and opinion.
- Use logic and informed judgment to accept or reject information.
- Record information using a variety of methods (such as note cards, word processor, database).

*Examples:*

- Alphabetical indexes, glossaries, and catalogs.
- Table of contents and indexes in a book.
- Library classification systems (Dewey Decimal system and Library of Congress classification systems.)
- Digital searches: keyword, controlled vocabulary, hierarchical directory, and Boolean logic searches (including truncation, adjacency, proximity, wild cards, limiting to dates or identified fields.)
- General Internet and specialized search engines (including an understanding of how search engines determine rank and relevancy).
- Page ranking and following links between web pages and sites. (Using “related links” in the browser or searching for links to a web site.)
- Databases, subscription and free, available from web pages.

## ORGANIZE AND DRAW CONCLUSIONS

The student will:

- Recognize categories, trends, and themes across multiple sources or data sets.
- Design tests or instruments to prove or disprove tentative conclusions or hypothesis.
- Create, analyze and interpret surveys, interviews, focus groups, artifacts, experiments, or documents.
- Determine if evidence supports the conclusion.
- Decide if more evidence or testing is needed to support claims.
- Organize an argument using patterns such as logic, analogy, compare and contrast, problem and solution, cause and effect in order to inform or persuade.

*Examples:*

- Summary
- Paraphrase
- Outline
- Sorting and categorization
- Patterns of argument (deductive, inductive, normative)

## COMMUNICATE

The student will:

- Select the best media for the message and audience.
- Understand and use the conventions used to convey messages in different media including:
  - print (essay, news article, formal research report, book, poetry)
  - multimedia presentation (designed to be used alone or used to support an oral presentation)
  - web page and web site

- video (documentary, news broadcast, fictional)
- public speaking (including visual aides)

*Examples:*

- Writing process
- Bibliographic citation
- Style manuals
- Graphic design (effects of color, font types, visual layout, etc.)
- Still and video photography
- Web design
- Audio recording devices
- Public address systems

## EVALUATE THE PRODUCT AND THE PROCESS

The student will:

- Seek review through teacher feedback, peer review, and self-reflection.
- Design tools for self-assessment.
- Consider questions for further research.

*Examples:*

- Rubrics
- Checklists
- Portfolios
- Journals
- Conferences

## II. Technology use

**Standard: The student will select and use the appropriate technology for educational and personal goals.**

The student will:

- Use input devices (keyboard, mouse, graphic tablet, scanner, touch screen, voice recognition).
- Use output devices (monitors, printers, speakers, data projectors and other presentation equipment.)
- Recognize the capacity/limitation of memory and disk storage space
- Manage, store, and retrieve files on local (floppy, CD, ZIP, USB drives) and remote drives and servers.
- Use passwords and security features.
- Format text using font styles and size, line spacing, indent, justification, margins, tabs.
- Edit text using insert and delete, cut, copy and paste, find and replace, spelling, grammar, and thesaurus checks).
- Create a spreadsheet , define columns and rows, set cell attributes, create

calculation formulas, use fill down/across, insert columns or rows, generate graphs.

- Create a database, determine field labels, enter data in consistent form, edit data adding records to a file and fields to a record, search, retrieve data, sort, and print reports.
- Create a presentation, add slides, create transitions, and animations.
- Insert tables in various applications (set column number and size)
- Insert headers and footers and pagination in a variety of applications.
- Insert graphics in various applications. (Use graphic file formats, insert, resize, crop, layer and align, select colors. Understand floating vs. inline, paint vs. draw)
- Manipulate sound and video file types. (For example, MPEG, Quicktime, WAVE, MP3.)
- Navigate web pages on the Internet or an intranet. (Track history, organize favorites, manage caching, cookies, security, and helper applications such as PDF.
- Use communication programs/devices such as phones, fax, email, instant messaging, video teleconference, synchronous and asynchronous communication tools.
- Participate in online or distance learning environments.
- Operate digital still and video cameras, analog cameras, VCR and DVD players and recorders.
- Use PDAs, graphing calculators global positioning devices, etc. as appropriate
- Understand implications of ergonomics including the effects of a sedentary lifestyle and overuse.
- Recognize potential and limiting factors in using, choosing technologies (connection speed/dial up/broadband, bandwidth requirements for video and audio streaming, large files and server space, etc.)
- Understand how technology affects the workplace and society.

### **III. Reading and media literacy**

#### READ FOR INFORMATION

**Standard: The student will select and read for educational and personal goals.**

The student will:

- Identify the topic, main points and supporting facts.
- Summarize, paraphrase, and select appropriate quotes.
- Outline and take notes based on reading.
- Scan (identify what should be read in depth).
- Interpret and make inferences.
- Determine authors purpose.

#### READ FOR PLEASURE

**Standard: The student will appreciate literature and understand literary conventions.**

The student will:

- Understand literary genres and forms (fiction, non-fiction, biography, science fiction, mystery, romance, adventure and poetry, prose, essays).
- Learn about the authors, their works, and creative writing processes.
- Know national and state literary awards (Caldecott, Newbery, Maud Hart Lovelace, etc.).
- Use tools for locating books they like that are at their reading level.
- Read a variety of high quality, classical and contemporary literary works.
- Read from texts representing a variety of genres (poetry, folk tales, drama, fantasy, realistic fiction, informational and biographical) representing America's multicultural experience and international works.
- Read for personal enjoyment.

**MEDIA LITERACY**

**Standard: The student will critically evaluate films, recordings, and other multimedia formats.**

The student will:

- Understand how meaning is conveyed in images and sound.
- Understand the effect of media on perception and culture.
- Evaluate television, radio, film productions, newspapers, and magazines with regard to quality of production, accuracy of information, bias, purpose, message and audience.
- Analyze the messages and points of view employed in different media, including advertising, news programs, web sites and documentaries.

**Standard: The student will create video and multimedia productions.**

Students will:

- Create multimedia presentations for an audience, demonstrating an understanding of visual design.
- Create video presentations for an audience, demonstrating an understanding of the language of images and sound.

*Examples:*

- Text design (for example, serif and sans serif fonts)
- Image (visual) design (color, line, texture, shape, etc.)
- Grammar of video (sequencing, camera angles and movement, scene composition, effects of lighting and sound, sound quality and effects)

#### **IV. Responsible use of technology and information**

**Standard: The student will understand ethical and safety issues related to information use including plagiarism and citing sources, copyright, intellectual freedom, acceptable use of school technologies, privacy, and evaluation of information.**

The student will:

- Follow the school's acceptable use policies for computers, networks, and the Internet.
- Understand plagiarism, cite sources, and compile a list of sources according to set of guidelines.
- Understand the practices necessary to protect one's intellectual property including how to copyright original material, use and protect passwords, and backup original digital creations.
- Use computer software according to licensing agreements.
- Understand fair use of copyrighted materials.
- Understand the principles of intellectual freedom.
- Understand how to navigate and communicate safely, respect the privacy of others, and protect one's own privacy when using networked resources.
- Practice critical evaluation of information.

**Standard: The student will use resources responsibly.**

The student will:

- Demonstrate respect for shared space (such as library, computer lab or studio).
- Demonstrate respect for shared materials and consumable resources (caring for and returning borrowed materials on time, printing judiciously)

**Standard: The student will use resources and learn independently and in collaboration with others.**

The student will:

- Demonstrate self-motivation and increasing responsibility for learning.
- Collaborate to share knowledge, information, and technology use.