

Disciplinary Literacy in North Dakota Content Standards

Literacy and text are specialized across the disciplines. Each discipline has a unique way of using text to create, disseminate, and evaluate knowledge. Strategies employed by learners as they encounter disciplinary texts come from the demands of the text and the purpose of the specific discipline.

The information below identifies some of the strategies for disciplinary literacy in various disciplines and aspects of the specific content standards within that discipline that refer to those strategies.

Computer Science and Cybersecurity

Disciplinary Literacy in Computer Science and Cybersecurity focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none"> Identify the strengths and weaknesses of different search engines. Use and evaluate multiple online sources. Evaluate the reliability of content from different websites, authors, and sources. Exchange ideas within and across communities. Synthesize input from multiple sources. Read and use technical manuals and information about innovative practices in technology. Understand the meaning of technical vocabulary. 	<ul style="list-style-type: none"> Create and communicate content using a variety of digital media options. Use the most effective platform to convey information. Determine the most effective way to convey content. Represent ideas symbolically (e.g., color, sound, images) to communicate and persuade. Collect and organize data in graphs and charts. Create computer programs applying technological symbols and coding. Compare software/devices/hardware to identify strengths and weaknesses for the task. Apply technical vocabulary in writing. 	<ul style="list-style-type: none"> Identify strengths and weaknesses of digital platforms for conveying information. Apply knowledge about appropriate and safe online behavior. Develop fluency with features of digital technology used. Make design decisions based on purpose and audience point of view. Collaborate with others to exchange ideas and create a product. Edit work and seek feedback about clarity, message, and impact. Evaluate the impact of online usage on digital identity. Find solutions to technical problems.

The North Dakota Computer Science and Cybersecurity Content Standards provide opportunities to address disciplinary literacy within the following strands:

- Computational Thinking** – this strand provides opportunities to embed disciplinary literacy as a part of strategies and knowledge used to solve problems, interpret data, and create computer programs.
- Information Literacy** – this strand provides opportunities to embed disciplinary literacy as learners access, use, and evaluate digital sources to conduct research and share information.
- Digital Citizenship** – this strand provides opportunities to embed disciplinary literacy as students communicate, collaborate, and interact within the digital environment.

Fine Arts

Disciplinary Literacy in the Fine Arts focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Find ideas and inspiration.• Search for innovative practices• Read reviews considering the perspectives of others.• Understand symbols and technical details related to the discipline.• Connect artistic ideas, theories, and works to the societal, cultural, or historical context.• Compare experiences with artists through biographies, articles, blogs, etc.• Understand specialized vocabulary.• Learn about instruments and tools used within the artistic discipline.	<ul style="list-style-type: none">• Evaluate artistic works.• React to artistic works.• Compare genres, styles, and performance techniques.• Articulate ideas and explain their evolution and/or the process used.• Analyze artistic works.• Interpret the meaning, ideas, and intent of artistic work	<ul style="list-style-type: none">• Create artistic ideas and works.• Analyze artistic works by applying knowledge of artistic elements and genres.• Refine or complete artistic work.• Apply problem-solving skills when creating artistic work.• Experiment and practice to develop and refine skills, craft, and techniques.• Determine how to convey meaning through the presentation of artistic works

The North Dakota Content Standards for Music, Visual Arts, Media Arts, Dance, and Theatre Arts address disciplinary literacy within artistic processes embedded in the four strands of the standards.

- **Creating** – these standards embed the critical thinking skills of disciplinary literacy as artistic works are created and refined.
- **Presenting/Performing/Producing** – these standards embed the disciplinary literacy skills as artistic works are shared, feedback is received, reflections on the process occur, and refinements are made.
- **Responding** – these standards provide opportunities to embed reading and writing disciplinary literacy skills as artistic works are analyzed and interpreted.
- **Connecting** – these standards provide opportunities to embed disciplinary literacy skills as connections are made with the societal, cultural, or historical contexts in which artistic works were created. The comparisons made between works or artists or oneself also create an opportunity to apply disciplinary literacy skills.

Health

Disciplinary Literacy in Health focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Read information objectively.• Read for facts, then cause/effect, then application.• Interpret the meaning of data, sketches, and charts.• Determine the validity and quality of evidence and sources.• Understand specialized vocabulary.• Read for details and precise concept interpretation.• Research new discoveries, findings, and treatments.• Increase understanding of health-related challenges and perspectives.• Research answers to health-related questions.• Seek evidence to form theories.	<ul style="list-style-type: none">• Use precise wording and terminology.• Compose phrases, bullets, graphs, or sketches.• Favor passive voice.• Seek exactness of information over craft.• Distinguish facts from opinions.• Communicate in a systematic, precise, and objective format.• Examine the science and chemistry behind symptoms, feelings, and behaviors.	<ul style="list-style-type: none">• Curiosity and personal interests focus learning.• Seek connections and cause/effect relationships.• Identify the need for more data.• Consider new hypotheses or evidence.• Contemplate the interplay of health-related factors.• Apply new information to actions and decisions.

The North Dakota Health Content Standards provide opportunities to address disciplinary literacy within the following standards:

- Analyze the influence of factors on healthy behaviors.
- Access valid health information, products, and services.
- Apply interpersonal communication skills.
- Use decision-making skills.
- Apply goal-setting skills.

Indigenous and World Languages

Disciplinary Literacy in the Indigenous and World Languages focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Use of cognates to determine meaning.• Infer vocabulary meaning from context.• Apply and transfer reading decoding and comprehension skills to works in the target language.• Reading works orally to “hear” the language.• Make predictions to increase understanding.• Read to consider cultural practices and perspectives.• Analyze cultural practices, traditions, and perspectives within a societal, cultural, or historical context.	<ul style="list-style-type: none">• Apply the rules of the target language regarding syntax and orthography when writing.• Analyze and imitate patterns, structures, and organizations of mentor texts.• Prioritize ideas over correctness in syntax and spelling.• Create presentations of information in the target language.• Analyze the contributions of the culture studied.• Reflect on experiences engaging with target language communities and experiences interacting with those communities	<ul style="list-style-type: none">• Tell stories orally to “hear” the language.• Transfer skills from the native language to the target language.• Use the three modes of communication (interpersonal, interpretive, and presentational)• Objectively consider different points of view• Identify similarities and differences in cultures.• Focus on approximations and practice using the target language

The North Dakota Indigenous and World Language Content Standards address disciplinary literacy within the strands of the standards.

- **Communication** – this strand embeds disciplinary literacy through the interpersonal, interpretive, and presentational communication skills essential to studying languages.
- **Cultures** – this strand embeds disciplinary literacy skills as cultural practices, perspectives, and products are analyzed to increase the interaction and understanding of the culture studied.
- **Connections** – this strand provides the opportunity to embed disciplinary literacy skills as connections are made with the target language and native language. Another opportunity exists as learners acquire information and diverse perspectives from information acquired regarding the target language and compare it to the native language.
- **Comparisons** – this strand provides opportunities to embed disciplinary literacy skills as learners compare the language and culture studied with their own.
- **Communities** – this strand provides opportunities to embed disciplinary literacy skills as students interact with communities where the target language is spoken.

Library Media

Disciplinary Literacy in Library Media focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Identify the strengths and weaknesses of different search engines.• Use and evaluate multiple online sources.• Evaluate the reliability of content from different websites, authors, and sources.• Exchange ideas within and across communities.• Synthesize input from multiple sources.	<ul style="list-style-type: none">• Create and communicate content using a variety of digital media options.• Use the most effective platform to convey information.• Determine the most effective way to convey content.• Represent ideas symbolically (e.g., color, sound, images) to communicate and persuade.• 	<ul style="list-style-type: none">• Identify strengths and weaknesses of digital platforms for conveying information.• Apply knowledge about appropriate and safe online behavior.• Develop fluency with features of digital technology used.• Make design decisions based on purpose and audience point of view.• Collaborate with others to exchange ideas and create a product.• Edit work and seek feedback about clarity, message, and impact.

The North Dakota Library Media Content Standards provide opportunities to address disciplinary literacy within the following strands:

- **Information Literacy** – this strand provides opportunities to embed disciplinary literacy as learners access, use, and evaluate sources to research and share information.
- **Digital Citizenship** – this strand provides opportunities to embed disciplinary literacy as students communicate, collaborate, and interact within the digital environment.

Mathematics

Disciplinary literacy in mathematics focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Read critically for details to help find solutions to problems.• Look for patterns and relationships.• Figure out symbols and abstract ideas.• Ask questions.	<ul style="list-style-type: none">• Explain, justify, describe, estimate, and analyze.• Write number expressions and formulas.• Apply mathematical vocabulary.• Include reasons and examples.	<ul style="list-style-type: none">• Apply previous understanding and look for patterns and connections.• Estimate, generalize, and find exceptions.• Apply mathematical principles.• Apply mathematical reasoning.• Use authentic situations.

"Disciplinary Literacy: A shift that Makes Sense" Releah Lent (2017)

The North Dakota Mathematics Content Standards address disciplinary literacy in math attributes.

- **Problem-Solving** – this attribute includes the practice of making sense of problems, persevering in solving them and attending to precision.
- **Connections** – this attribute includes looking for and using the structure and looking for and expressing regularity in repeated reasoning.
- **Reasoning and Proof** – this attribute includes the practices of modeling and using tools strategically, reasoning abstractly and quantitatively, and the communication practices of constructing viable arguments and critiquing the reasoning of others.

Physical Education

Disciplinary Literacy in Physical Education focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• “Read” video clips, paying attention to details (e.g., body position, team formation, individual errors, pivotal moments).• Interpret specialized vocabulary and phrases.• “Read” a sports performance and evaluate the strengths and weaknesses of individuals and teams.• Identify perspectives provided in blogs, articles, or when listening to the commentary.• Translate symbols, diagrams, illustrations, and charts to concepts.• Interpret and analyze numerical data.• “Read” meaning of body positions and gestures.• Interpret fitness findings gathered from technology.• Identify themes of perseverance, overcoming obstacles, and learning from mistakes in novels, sportscasts, articles, and movies.• Analyze details related to game rules and regulations.	<ul style="list-style-type: none">• Use short, succinct sentences or phrases to describe details.• Compose and defend arguments based on evidence and expert sources.• Communicate with charts, diagrams, sketches, and symbols.• Use precise vocabulary and technical language when describing movement.• Express analysis of athletic competitions.• Provide constructive feedback.• Note similarities and differences between sports.• 	<ul style="list-style-type: none">• Visualize movements from verbal or written descriptions.• Analyze problems and propose solutions related to physical fitness, team performance, or pace of progress.• Identify and articulate personal fitness goals.• Make connections between specific conditioning practices to strength and agility.• Communicate priorities of cooperation and selflessness in team sports.• Identify and articulate the cause/effect relationship between physical activity and health, mood, self-discipline, and social interaction.• Evaluate written and oral feedback.

The North Dakota Physical Education Content Standards provide opportunities to address disciplinary literacy within the following standards:

- Demonstrate the knowledge and skills to achieve and maintain a health-enhancing physical activity and fitness level.
- Recognize the value of physical activity for health, enjoyment, challenge, self-expression, and/or social interaction.

Science

Disciplinary literacy in science focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Ask “Why?” questions.• Interpret data, charts, and illustrations.• Understand concepts and vocabulary.• Determine the validity of sources and quality of evidence presented.• Read closely to pay attention to details.	<ul style="list-style-type: none">• Use precise scientific vocabulary.• Use passive voice.• Writing favors the exactness of the information.• Synthesize evidence and focus on methods used to gather evidence.• Include phrases, bullets, graphs, or sketches.	<ul style="list-style-type: none">• Create questions based on curiosity.• Rely on prior knowledge or research.• Consider new evidence or conclusion (hypothesis).• Propose explanations.• Create solutions in authentic situations.

“Disciplinary Literacy: A shift that Makes Sense” Releah Lent (2017)

The North Dakota Science Content Standards address disciplinary literacy with Science and Engineering Practices.

- Ask questions and define problems.
- Develop and use models.
- Plan and carry out investigations.
- Analyze and interpret data.
- Use mathematical and computational thinking.
- Construct explanations and design solutions.
- Engage in argument from evidence.
- Obtain, evaluate, and communicate information.

Social Studies

Disciplinary literacy in social studies focuses on the following:

Reading	Writing	Thinking
<ul style="list-style-type: none">• Interpret primary and secondary sources.• Identify bias, propaganda, and logical fallacies.• Think sequentially.• Compare events, accounts, documents, and visuals.• Use context to determine word meaning.• Consider time period and point(s) of view (from multiple perspectives)	<ul style="list-style-type: none">• Create timelines accompanied by narratives.• Synthesize information or evidence from multiple sources.• Organize ideas coherently.• Create argumentative essays.• Weigh multiple ideas and large quantities of information.	<ul style="list-style-type: none">• Create narratives.• Use valid primary and secondary sources to guide thoughts.• Compare/contrast causes and effects.• Consider inquiries across long periods.• Recognize bias, propaganda, and logical fallacies.

"Disciplinary Literacy: A shift that Makes Sense" Releah Lent (2017)

The North Dakota Social Studies Content Standards included the 2017 English Language Arts Standards for disciplinary literacy in the document's appendices. These standards focus on the following:

- Read the text closely and cite textual evidence.
- Summarize key details, central themes, or ideas.
- Analyze interactions of individuals, events, or ideas from the text.
- Interpret vocabulary used in the text.
- Analyze text structure and points of view expressed in text.
- Evaluate and analyze content presented in media, visuals, videos, tables, graphs, charts, maps, or text.
- Analyze and evaluate specific arguments and claims and the validity and sufficiency of reasoning and evidence presented.
- Use valid, sufficient, and relevant evidence to support claims in arguments.
- Organize complex ideas and information reported or presented clearly.
- Gather information, evaluate multiple sources, and cite materials accurately when reporting findings from research.
- Consider the audience, task, and purpose when analyzing primary and secondary sources and presenting findings.

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