

## 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"> <li>Evaluate the reliability of content from different websites, authors, and sources.</li> <li>Exchange ideas within and across communities.</li> <li>Read and use technical manuals and information about innovative practices in technology.</li> <li>Understand the meaning of technical vocabulary.</li> <li>Collect, organize, and analyze data.</li> </ul> | <ul style="list-style-type: none"> <li>Create and communicate content using a variety of digital media options.</li> <li>Determine the most effective way to convey content.</li> <li>Represent ideas symbolically (e.g., color, sound, images) to communicate.</li> <li>Collect and represent data.</li> <li>Create algorithms to reflect daily life processes.</li> <li>Apply technical vocabulary in writing.</li> </ul> | <ul style="list-style-type: none"> <li>Identify strengths and weaknesses of digital platforms for conveying information.</li> <li>Apply knowledge about appropriate and safe online behavior.</li> <li>Develop fluency with the features of digital technology used.</li> <li>Collaborate with others to exchange ideas and create a product.</li> <li>Edit work and seek feedback about clarity, message, and impact.</li> <li>Evaluate the impact of online usage on digital identity.</li> <li>Find technical solutions to problems.</li> </ul> |

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

- Computing Devices and Systems:** This concept provides opportunities to embed disciplinary literacy as learners develop an understanding of how networks, hardware, and software function and interact, fostering adaptable skills for digital environments.
- Algorithms and Computational Thinking:** This concept provides opportunities to embed disciplinary literacy as learners develop and apply a basic understanding of algorithms and computational thinking, enhancing problem-solving and critical-thinking skills.
- Impacts of Computing:** This concept provides opportunities to embed disciplinary literacy as learners understand how technology shapes individuals and the world and influences safety policy, law, and ethics.
- Digital Citizenship:** This concept provides opportunities to embed disciplinary literacy as learners practice responsible digital consumption, creation, communication, and interaction.
- Security:** This concept provides opportunities to embed disciplinary literacy as learners gain a foundational understanding of safe and best practices for data and system security, including information, network, and physical security.

## Fine Arts

Disciplinary Literacy in the Fine Arts focuses on the following:

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

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

- **Creating:** These standards embed the critical thinking skills of disciplinary literacy as artistic works are created and refined.
- **Presenting/Performing/Producing:** These standards embed 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. Comparing works, artists, or oneself also creates an opportunity to apply disciplinary literacy skills.

## **Health**

Disciplinary Literacy in Health focuses on the following:

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

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

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 allows for embedding 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:

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

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

*"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 communicating by 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"> <li>• “Read” live or recorded physical performances, paying attention to details (e.g., form and technique, strategy, individual errors, pivotal moments).</li> <li>• “Read” environments for safety considerations and risks.</li> <li>• Read and understand specialized vocabulary and phrases.</li> <li>• “Read” a physical performance and evaluate the strengths and weaknesses of individuals and teams.</li> <li>• Identify perspectives provided in blogs, articles, or when listening to commentary.</li> <li>• Translate symbols, diagrams, illustrations, and charts into concepts.</li> <li>• Identify themes of perseverance, overcoming obstacles, and learning from mistakes in novels, sports casts, articles, and movies.</li> </ul> | <ul style="list-style-type: none"> <li>• Use succinct sentences or phrases to describe details.</li> <li>• Compose and defend arguments based on evidence and expert sources.</li> <li>• Communicate with data, charts, diagrams, sketches, and symbols.</li> <li>• Use precise vocabulary and technical language when describing movement.</li> <li>• Express analysis of physical movement.</li> <li>• Provide constructive feedback in movement settings.</li> <li>• Note similarities and differences between physical activities.</li> </ul> | <ul style="list-style-type: none"> <li>• Visualize movements from verbal or written descriptions.</li> <li>• Analyze problems and propose solutions related to physical fitness, performance, or pace of progress.</li> <li>• Identify and articulate personal fitness goals.</li> <li>• Make connections between specific conditioning practices and strength and agility.</li> <li>• Communicate the priorities of cooperation and selflessness in sports.</li> <li>• Identify and articulate the cause-and-effect relationship between physical activity and health, mood, self-discipline, and social interaction.</li> <li>• Evaluate written and oral feedback.</li> <li>• Interpret and analyze numerical data.</li> <li>• Interpret fitness findings gathered from technology.</li> <li>• Analyze details related to game rules and regulations.</li> </ul> |

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

- **3-5.MM.1 Choice.** Express how personal interests influence participation in physical activity.
- **3-5.MM.2 Resilience.** List strengths and growth opportunities through movement and opportunities for practice for individual improvement.
- **3-5.MM.3 Reflection.** Reflect on physical activity experiences.

- **K-2.MM.4 Goal Setting.** Set observable short-term goals to enhance fitness development.
- **3-5.MM.4 Goal Setting.** Set observable and attainable long-term goals to enhance fitness development.
- **K-2.KM.4 Body Responses to Movement.** Identify physiological changes in the body during physical activities.
- **3-5.KM.4 Body Responses to Movement.** Describe how physical activity influences physiological changes in the body.
- **K-2.KM.5 Warm-Up/Cool-Down.** Identify how warm-up and cool-down affect the body.
- **K-2.KM.6 Dimensions of Health.** Identify how physical activity supports each dimension of health.
- **3-5.KM.6 Dimensions of Health.** Explain how physical activity supports each dimension of health.
- **K-2.KM.5 Warm-Up/Cool-Down.** Identify how warm-up and cool-down affect the body.
- **3-5.KM.6 Warm-Up/Cool-Down.** Describe how warm-up and cool-down affect the body.
- **6-8.KM.10 Warm-Up/Cool-Down.** Identify and demonstrate dynamic and static stretching to exercise in warm-up and cool-down activities.
- **6.KM.6 Principles of Exercise.** Identify the principles of exercise.
- **6-8.KM.8 Target Heart Rate.** Define resting and target heart rate and describe their relationship to aerobic fitness and the Borg Rating of Perceived Exertion (RPE) Scale.
- **6.PSS.12 Feedback.** Provide and/or accept constructive feedback.
- **6-8.MM.2 Reflection.** Reflect on physical activity experiences specifically related to personal meaning and enjoyment.
- **6.KM.9 Anatomy.** Identify the major muscles.
- **7.KM.9 Anatomy.** Identify the major muscles and give an example of exercises that utilize that muscle group.
- **8.KM.9 Anatomy.** Identify the major muscle groups and give examples of exercises that utilize that muscle group.
- **6-8.KM.10 Warm-Up/Cool-Down.** Identify and demonstrate dynamic and static stretching to exercise in warm-up and cool-down activities.
- **6-8.PSS.11 Communication.** Apply communication skills to negotiate strategies and tactics in physical activities.
- **6.MM.4 Goal Setting.** Set a goal based on examining individual ability in a physical activity setting.
- **7.MM.4 Goal Setting.** Set a goal and create action steps for a goal based on an examination of individual ability in a physical activity setting.
- **8.MM.4 Goal Setting.** Set a goal, create action steps, and reflect on goals by examining individual ability in a physical activity setting.

(continued) The North Dakota Physical Education Content Standards provide opportunities to address disciplinary literacy with the following standards:

- **L1.KM.1** Analyze motor performance of self and/or others about movement concepts and principles
- **L1.KM.3** Use technology to analyze and improve motor performance
- **L1.KM.4** Evaluate risks and identify safety considerations for physical activities.
- **L1.KM.7** Use technology to analyze exertion and fitness levels.
- **L1.KM.8** Develop a personal fitness plan to improve one health-related fitness component
- **L1.KM.11** Identify valid resources for physical activity and fitness
- **L1.PSS.4** Analyze ethical situations in physical activity, both in and outside of physical education, and how choices impact self and others
- **L1.PSS.8** Encourage, support, and positively contribute when working with peers in a physical activity setting, both in and outside physical education.
- **L1.PSS.9** Understand and respond constructively to cultural values, traditions, and differences in physical activity settings both in and outside physical education.
- **L1.MM.1** Assess personal strengths, interests, and growth opportunities and how they influence the level of challenge selected in fitness and physical activities.
- **L1.MM.7** Set a fitness goal and develop a progressive action plan.

## Science

Disciplinary literacy in science focuses on the following:

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

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

*"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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