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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR GRADES K-12

2 1. The technology integration standards may include skills for:

- 3 a. empowered learners
- 4 b. digital citizens
- 5 c. knowledge constructors
- 6 d. innovative designers
- 7 e. computational thinkers
- 8 f. creative communicators
- 9 g. global collaborators
- 10 h. reflective users

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- 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR KINDERGARTEN
- 2 1. The empowered learner content standards for kindergarten are that each student will:
- 3 a. explore a variety of technologies that will help them in their learning
- 4 2. The digital citizen content standards for kindergarten are that each student will:
- 5 a. explore appropriate use of devices
- 6 b. explore sharing of information and how to respect the work of others
- 7 c. explore the importance of keeping their information private
- 8 3. The innovative designer content standards for kindergarten are that each student will:
- 9 a. explore a design process with digital and non-digital tools
- 10 4. The computational thinker content standards for kindergarten are that each student will:
- 11 a. explore how technology is used to make a task easier

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1 THE TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR FIRST GRADE

- 2 1. The empowered learner content standards for first grade are that each student will:
- 3 a. explore a variety of technologies that will help them in their learning
- 4 2. The digital citizen content standards for first grade are that each student will:
- 5 a. practice responsible use of technology
- 6 b. explore appropriate use of devices and how to be safe online
- 7 c. explore sharing of information and how to respect the work of others
- 8 d. explore the importance of keeping their information private
- 9 3. The innovative designer content standards for first grade are that each student will:
- 10 a. explore digital and non-digital tools to design a product
- 11 b. explore a design process to develop ideas or creations
- 12 4. The computational thinker content standards for first grade are that each student will:
- 13 a. explore breaking down a problem into parts and identify ways to solve the
- 14 problem

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## 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR SECOND GRADE

- 2 1. The empowered learner content standards for second grade are that each student will:
  - 3 a. explore a variety of technologies that will help them in their learning
- 4 2. The digital citizen content standards for second grade are that each student will:
  - 5 a. practice responsible use of technology
  - 6 b. explore appropriate use of devices and how to be safe online
  - 7 c. explore ownership of information and how to respect the work of others
  - 8 d. explain the importance of keeping their information private
- 9 3. The knowledge constructor content standards for second grade are that each student  
10 will:
  - 11 a. explore a variety of tools to organize information
- 12 4. The innovative designer technology content standards for second grade are that each  
13 student will:
  - 14 a. use digital and non-digital tools to design a product
  - 15 b. use a design process to develop ideas or creations
- 16 5. The computational thinker content standards for second grade are that each student will:
  - 17 a. break down a problem into parts and identify ways to solve the problem
  - 18 b. explain how technology can make a task easier
- 19 6. The creative communicator content standards for second grade are that each student  
20 will:
  - 21 a. explore different tools for creating something new or for communicating with  
22 others

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## TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR THIRD GRADE

- 1 1. The empowered learner content standards for third grade are that each student will:
  - 2 a. set personal learning goals and use appropriate technologies that will
  - 3 demonstrate knowledge
  - 4 b. recognize how knowledge can be transferred between tools
- 5 2. The digital citizen content standards for third grade are that each student will:
  - 6 a. identify and practice responsible use of technology
  - 7 b. identify appropriate use of devices and how to be safe online
  - 8 c. identify ownership of information and how to respect the work of others
  - 9 d. recognize the importance of keeping their information private
- 10 3. The knowledge constructor content standards for third grade are that each student will:
  - 11 a. identify digital tools and resources to find information on topics of interest
  - 12 b. explore sources for accuracy, credibility, and relevance
  - 13 c. identify a variety of tools to organize information
- 14 4. The innovative designer content standards for third grade are that each student will:
  - 15 a. define questions, find solutions, test ideas to solve problems and share their
  - 16 learning
  - 17 b. use digital and non-digital tools to design a product with a step-by-step design
  - 18 process
- 19 5. The computational thinker content standards for third grade are that each student will:
  - 20 a. define a problem and select appropriate technology tools to explore and find
  - 21 solutions
  - 22 b. evaluate data in order to identify patterns and categories
  - 23 c. break down problems into smaller parts, identify key information, and propose
  - 24 solutions
  - 25 d. evaluate how technology is used to make a task easier or repeatable
- 26 6. The creative communicator content standards for third grade are that each student will:
  - 27 a. use strategies for remixing or repurposing resources to create new works
  - 28 b. create digital objects to communicate ideas visually and graphically
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## 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR FOURTH GRADE

- 2 1. The empowered learner content standards for fourth grade are that each student will:
  - 3 a. develop learning goals and choose the appropriate technology tools to achieve
  - 4 them
  - 5 b. explore technologies and transfer their learning to different tools or learning
  - 6 environments
- 7 2. The digital citizen content standards for fourth grade are that each student will:
  - 8 a. recognize the role an online identity plays in the digital world and in real life
  - 9 b. practice safe, legal and ethical behavior when using technology and interacting
  - 10 online
  - 11 c. define ownership of intellectual property and appropriate sharing of information
  - 12 d. identify what personal data is, the importance of keeping it private, and how it
  - 13 might be shared online
- 14 3. The knowledge constructor content standards for fourth grade are that each student will:
  - 15 a. use research techniques to locate digital resources
  - 16 b. evaluate sources for accuracy, perspective, cultural sensitivity, credibility, and
  - 17 relevance
  - 18 c. use a variety of strategies to organize information and make meaningful
  - 19 connections between resources
- 20 4. The innovative designer technology content standards for fourth grade are that each
- 21 student will:
  - 22 a. practice using digital and non-digital tools to plan and manage a design process
  - 23 b. practice using a cyclical design process to develop prototypes and reflect on the
  - 24 role that trial and error play
- 25 5. The computational thinker content standards for fourth grade are that each student will:
  - 26 a. explore or solve problems by selecting technology, analyzing data, and creating
  - 27 models
  - 28 b. break down problems into smaller parts, identify key information, and propose
  - 29 solutions
  - 30 c. explore basic concepts related to automation, patterns, and algorithmic thinking
- 31 6. The creative communicator content standards for fourth grade are that each student will:
  - 32 a. identify the features and functions of a variety of creation or communication tools
  - 33 b. create original works by practicing strategies for remixing or repurposing
  - 34 c. create digital objects to communicate ideas visually and graphically
- 35 7. The global collaborator content standards for fourth grade are that each student will:
  - 36 a. identify digital tools to work with friends and people from different backgrounds or
  - 37 cultures
  - 38 b. identify collaborative technologies to connect with others, including peers,
  - 39 experts and community members, to explore different points of view on various
  - 40 topics
  - 41 c. practice working with others using collaborative technologies

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- 1 8. The reflective user content standards for fourth grade are that each student will:
- 2     a. evaluate personal preferences for use of technology tools for different tasks or
- 3     purposes

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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## 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR FIFTH GRADE

- 2 1. The empowered learner content standards for fifth grade are that each student will:
  - 3 a. develop learning goals, select the technology tools to achieve them, and reflect
  - 4 on and revise the learning process as needed to achieve goals
  - 5 b. transfer their learning to different tools or learning environments
- 6 2. The digital citizen content standards for fifth grade are that each student will:
  - 7 a. demonstrate an understanding of the role an online identity plays in the digital
  - 8 world and permanence of their decisions when interacting online
  - 9 b. engage in safe, legal and ethical behavior when using technology and interacting
  - 10 online
  - 11 c. demonstrate respect for intellectual property when using and sharing the work of
  - 12 others
  - 13 d. explain what personal data is, how to keep it private, and how it might be shared
  - 14 online
- 15 3. The knowledge constructor content standards for fifth grade are that each student will:
  - 16 a. employ appropriate research techniques to locate digital resources
  - 17 b. evaluate sources for accuracy, perspective, cultural sensitivity, credibility, and
  - 18 relevance
  - 19 c. organize information and make meaningful connections between resources
- 20 4. The innovative designer technology content standards for fifth grade are that each
- 21 student will:
  - 22 a. use a design process to generate ideas, consider solutions, solve a problem or
  - 23 create innovative products
  - 24 b. use digital and non-digital tools to plan and manage a design process
  - 25 c. use a cyclical design process to develop prototypes and reflect on the role that
  - 26 trial and error play
- 27 5. The computational thinker content standards for fifth grade are that each student will:
  - 28 a. explore or solve problems by selecting technology for data analysis, modeling
  - 29 and algorithmic thinking
  - 30 b. break down problems into smaller parts, identify key information, and propose
  - 31 solutions
  - 32 c. identify basic concepts related to automation, patterns, and algorithmic thinking
- 33 6. The creative communicator content standards for fifth grade are that each student will:
  - 34 a. identify and use the features of a variety of creation or communication tools
  - 35 b. use a variety of strategies for remixing or repurposing to create new works
  - 36 c. create digital objects to communicate ideas visually and graphically
- 37 7. The global collaborator content standards for fifth grade are that each student will:
  - 38 a. use appropriate digital tools to work with friends and people from different
  - 39 backgrounds or cultures
  - 40 b. perform a variety of roles within a team using age-appropriate technology to
  - 41 complete a project or solve a problem

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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- 1 8. The reflective user content standards for fifth grade are that each student will:
- 2     a. evaluate personal preferences for use of technology tools for different tasks or
- 3     purposes

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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## 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR SIXTH - EIGHTH 2 GRADES

- 3 1. The empowered learner content standards for sixth- eighth grades are that each student  
4 will:
  - 5 a. define personal learning goals, select and manage appropriate technologies to  
6 achieve them, and reflect on their successes and areas of improvement in  
7 working toward their goals
  - 8 b. navigate a variety of technologies and transfer their knowledge and skills to learn  
9 how to use new technologies
- 10 2. The digital citizen content standards for sixth-eighth grades are that each student will:
  - 11 a. manage their digital identities and reputations, including demonstrating an  
12 understanding of how digital actions are permanent and never fully erasable
  - 13 b. demonstrate positive, safe, legal and ethical habits when using technology and  
14 when interacting with others online
  - 15 c. demonstrate and model the use of intellectual property of print and digital media,  
16 including copyright, permission and fair use, by creating a variety of media  
17 products that include appropriate citation and attribution elements
  - 18 d. demonstrate how to keep personal data secure and understand how data-  
19 collection technologies work
- 20 3. The knowledge constructor content standards for sixth-eighth grades are that each  
21 student will:
  - 22 a. use research strategies effectively to locate appropriate digital resources in  
23 support of their learning
  - 24 b. evaluate resources for accuracy, perspective, cultural sensitivity, credibility and  
25 relevance
  - 26 c. locate and collect resources from a variety of sources and organize into  
27 collections for a range of projects and purposes
- 28 4. The innovative designer technology content standards for sixth-eighth grades are that  
29 each student will:
  - 30 a. engage in design processes to generate ideas, create innovative products, or  
31 solve problems
  - 32 b. select and use digital tools to support design processes, identify constraints and  
33 trade-offs, and weigh risks
  - 34 c. engage in design processes to develop, test and revise prototypes, use the  
35 cyclical process of trial and error, and understanding problems or setbacks as  
36 potential opportunities for improvement
- 37 5. The computational thinker content standards for sixth-eighth grades are that each  
38 student will:
  - 39 a. investigate and practice solving problems by using data analysis, modeling or  
40 algorithmic thinking

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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- 1           b. organize data and use technology to display, analyze, solve problems, and make  
2            decisions
- 3           c. break down problems into component parts, identify key pieces and use that  
4            information to problem solve
- 5           d. demonstrate an understanding of how automation works and use algorithmic  
6            thinking to design and automate solutions
- 7   6. The creative communicator content standards for sixth-eighth grades are that each  
8    student will:
  - 9           a. select appropriate platforms and tools to create, share, and communicate their  
10          work
  - 11          b. create original works or responsibly remix and repurpose other digital resources  
12          into new creative works
  - 13          c. communicate complex ideas clearly using various digital tools to convey the  
14          concepts textually, visually, or graphically
- 15   7. The global collaborator content standards for sixth-eighth grades are that each student  
16    will:
  - 17          a. identify and use collaborative technologies to connect with others, including  
18          peers, experts, and community
  - 19          b. determine their role on a team to meet goals, based on their knowledge of  
20          technology and content, as well as personal preference
- 21   8. The reflective user content standards for sixth-eighth grades are that each student will:
  - 22          a. examine historical, cultural, and social impacts of technology innovations on  
23          individuals and groups, including American Indians
  - 24          b. explain how technology innovations influence their individual technology tool and  
25          resource preferences

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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## 1 TECHNOLOGY INTEGRATION CONTENT STANDARDS FOR NINTH-TWELFTH 2 GRADES

- 3 1. The empowered learner content standards for ninth-twelfth grades are that each student  
4 will:
  - 5 a. set personal learning goals, develop strategies leveraging technology to achieve  
6 them, and reflect on the learning process to improve learning outcomes
  - 7 b. build networks and customize their learning environments in ways that support  
8 their learning process
  - 9 c. use technology to seek feedback that informs and improves their practice and to  
10 demonstrate their learning in a variety of ways
  - 11 d. demonstrate the ability to choose, use, and troubleshoot current technologies,  
12 and transfer their knowledge to explore emerging technologies
- 13 2. The digital citizen content standards for ninth-twelfth grades are that each student will:
  - 14 a. cultivate and manage a positive digital identity and reputation
  - 15 b. engage in positive, safe, legal and ethical behavior when using technology,  
16 including social interactions online or when using networked devices
  - 17 c. respect the rights and obligations of creating, using, and sharing intellectual  
18 property
  - 19 d. manage their personal data to maintain digital privacy and security
- 20 3. The knowledge constructor content standards for ninth-twelfth grades are that each  
21 student will:
  - 22 a. use research strategies to locate information and resources for their intellectual  
23 or creative pursuits
  - 24 b. evaluate the accuracy, perspective, cultural sensitivity, credibility, and relevance  
25 of information, media, data, or other resources
  - 26 c. curate information from digital resources using a variety of tools and methods to  
27 create collections of artifacts that demonstrate meaningful connections or  
28 conclusions
- 29 4. The innovative designer technology content standards for ninth-twelfth grades are that  
30 each student will:
  - 31 a. initiate a deliberate design process for generating ideas, testing theories, creating  
32 innovative artifacts, or solving authentic problems
  - 33 b. select and use digital tools to plan and manage a design process that considers  
34 design constraints and calculated risks
  - 35 c. develop, test and refine prototypes as part of a cyclical design process
- 36 5. The computational thinker content standards for ninth-twelfth grades are that each  
37 student will:
  - 38 a. identify problems suited for technology-assisted methods for data analysis,  
39 abstract models, and algorithmic thinking

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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- 1           b. collect data or identify relevant data sets, use digital tools to analyze them, and  
2           represent data in various ways to facilitate problem-solving and decision-making
- 3           c. break down problems into component parts, extract key information, and develop  
4           descriptive models to understand complex systems or facilitate problem-solving
- 5           d. explain how automation works and use algorithmic thinking to develop a  
6           sequence of steps to create and test automated solutions
- 7       6. The creative communicator content standards for ninth-twelfth grades are that each  
8       student will:
  - 9           a. choose the appropriate platforms and tools for meeting the desired objectives of  
10           their creation or communication
  - 11           b. create original works or responsibly repurpose or remix digital resources into new  
12           creative works
  - 13           c. communicate complex ideas clearly and effectively by creating or using a variety  
14           of digital objects such as visualizations, models or simulations
  - 15           d. publish, present, and defend content that customizes the message and medium  
16           for their intended audiences
- 17       7. The global collaborator content standards for ninth-twelfth grades are that each student  
18       will:
  - 19           a. identify and use digital tools to connect with learners from a variety of  
20           backgrounds and cultures, engaging with them in ways that broaden mutual  
21           understanding and learning
  - 22           b. identify and use collaborative technologies to work with others, including peers,  
23           experts or community members, to examine issues and problems from multiple  
24           viewpoints
  - 25           c. contribute constructively to project teams, assuming various roles and  
26           responsibilities to work effectively toward a common goal
- 27       8. The reflective user content standards for ninth-twelfth grades are that each student will:
  - 28           a. evaluate historical, cultural, and social impacts of technology innovations on  
29           individuals and groups, including American Indians
  - 30           b. explain how technology innovations influence their individual technology tool and  
31           resource preferences

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# TECHNOLOGY INTEGRATION STANDARDS DRAFT FOR NRC 12.5.19

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1 Administrative Rules of Montana Chapter 55

2 Program Delivery Standards Recommendation - NEW

3 1. In general, a basic program in technology education shall:

4 a. meet the following conditions:

5 i. development of skills that lead to lifelong pursuits;

6 ii. provide opportunities for authentic application, work experience, and  
7 articulation with postsecondary education

8 iii. integrate and transfer technology skills across grade levels, content  
9 areas, and programs

10 iv. provide access to emerging technology across grade levels, content  
11 areas, and programs

12 b. include the following practices:

13 i. full progression of skills and knowledge from basic to advanced

14 ii. full integration of technology competencies with academic knowledge in a  
15 contextual setting

16 iii. include whole group, teacher-led, or personalized instruction