



Computer Science, Library Media, and Technology Integration Standards Negotiated Rulemaking Committee Agenda

When: February 24, 2020
Time: 9:00 a.m. to 4 p.m.
Where: Capitol Building, Rm 137, Helena, MT 59601
Lunch: On your own

Committee members are welcome to arrive at 8:30 a.m. to check computer or device connectivity.
Lunch break, on your own, at approximately 12:00 p.m.
The Committee will move through the agenda as needed.

9:00 a.m. Introductions
 Call to Order
 Review Negotiated Rulemaking roles, responsibilities, and process
 Proposed rule changes
 • Complete Library Media/Information Literacy Proposal Review
 Overview of Economic Impact Surveys and Timelines
 Set Next Meeting Date (if necessary)
 Public comment
4:00 p.m. Adjourn

NEGOTIATED RULEMAKING COMMITTEE

Computer Science, Library
Media/Information Literacy, and
Technology Integration

Content Standards Revision

February 24, 2020

Putting Montana Students First **A+**



PUBLIC MEETING

All comments received become part of the official public record of the Negotiated Rulemaking Committee proceedings in accordance with MCA 2-3-212.

This meeting is being recorded and streamed via MPAN.

Please use the microphone whenever you are speaking.

Remote participants are joining this meeting via conference call.

CALL TO ORDER



MEETING AGENDA

Call to Order

- Housekeeping
- Review Process and Guidelines

Proposed Rule Changes

- Complete Library Media/Information Literacy review

Lunch

Proposed Rule Changes

- Library Media / Information Literacy (continued)

Economic Impact Report and Data

Negotiated Rulemaking and MAPA Timelines

Public Comment

Adjourn

HOUSEKEEPING

Restrooms and Breaks

Connectivity Check/ Device Setup

Committee Agenda Packet

Lunch break at 12 p.m.

Work Session concludes at 4 p.m.

ROLES AND RESPONSIBILITIES

Committee Members

- review drafts prepared by the revision team to provide feedback and a recommendation to the Superintendent on the draft
- assist in determining the economic impact of the draft

OPI and BPE Staff

- support the work of the committee

PROCESS

Where are WE?

Montana Constitution

Montana Code Annotated (Legislature)



Administrative Rules of Montana (OPI NR
Committee OPI BPE)

Policy (School Trustees)

Procedure (School Administrator)

BACKGROUND AND CONTEXT FOR RULE CHANGE

The Board of Public Education sets forth the following guidelines for content standards revision:

- Standards will define what all students should know and be able to do;
- Standards will be challenging and rigorous;
- Standards will be clear, understandable, and free of jargon;
- Standards will be measurable;
- Standards will address diversity, specifically fulfilling the commitment to implementing Indian Education for All;
- Standards will be consistent with the grade level and grade band structures in ARM Chapter 53; and
- Content standards will be consistent with the program delivery standards described in ARM Chapter 55.

BACKGROUND AND CONTEXT FOR RULE CHANGES TO LIBRARY MEDIA

Current Library Media/Information Literacy content standards were adopted in 2008

- Program delivery standards (Ch 55) were not updated in 2008

Organized by grade level for K-5 and by grade band for 6-8 and 9-12

- Grade level standards for K-5 clarify learning expectations for elementary teachers who teach in all content areas
- Grade band standards for 6-8 and 9-12 clarify expectations and allow for flexibility of program delivery

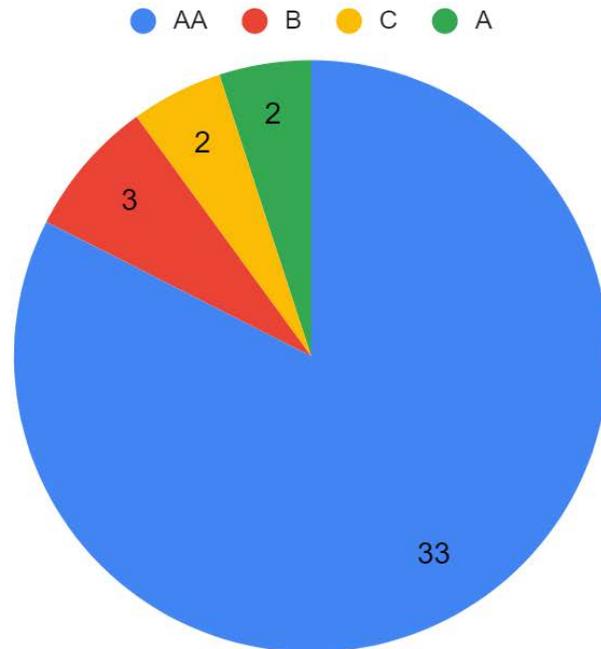
Integration of Indian Education for All

Emphasis on the skills students need to be information literate in any information or problem solving environment

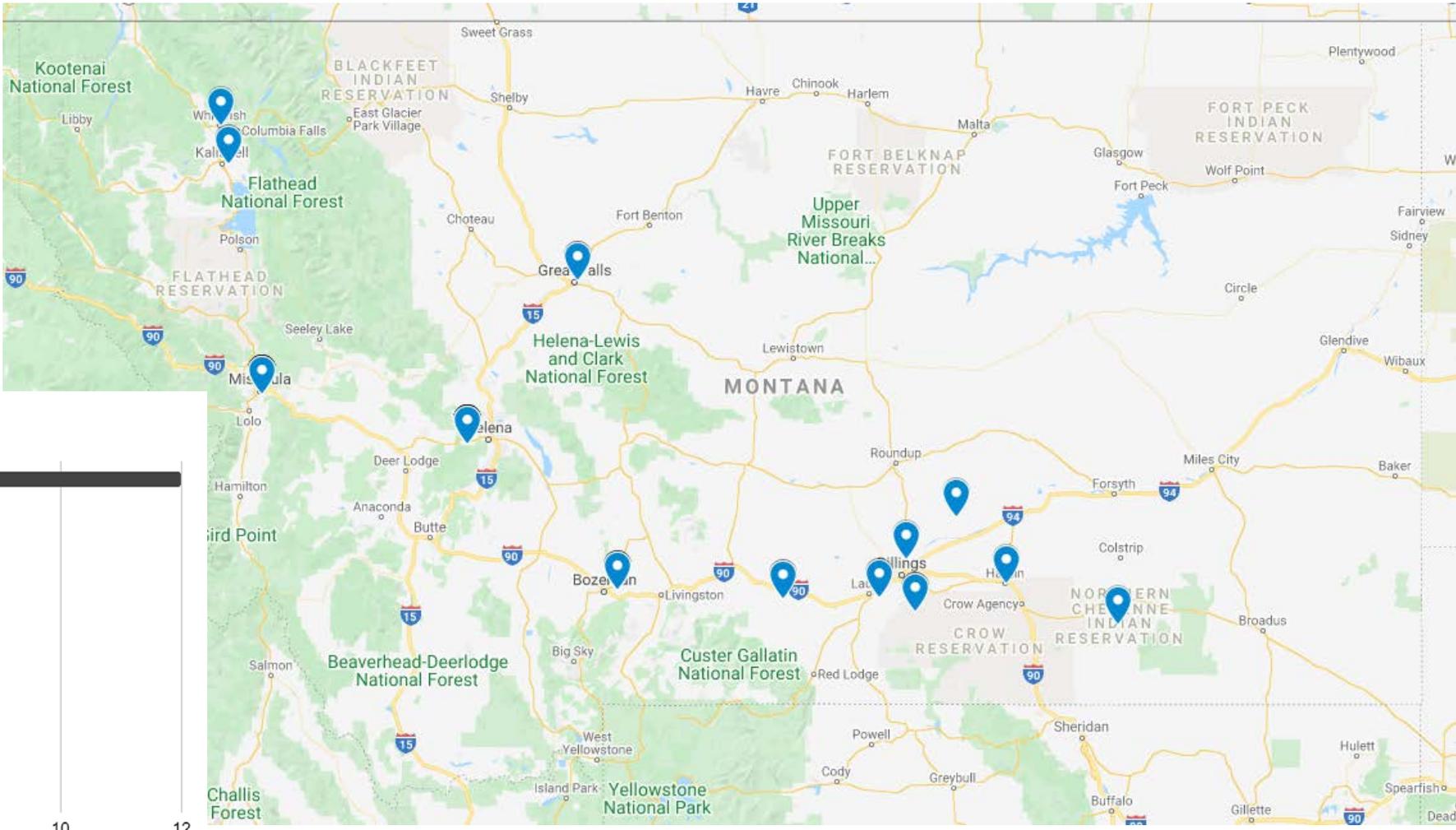
Comment Summary

Library Media/Information Literacy (n=40)

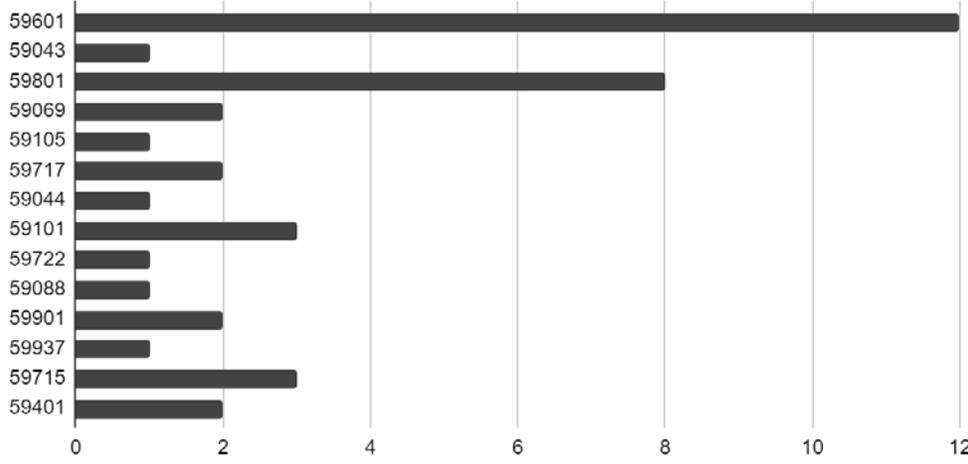
School Size



- 2 additional comments received on 2/21/2020
- comments are from school librarians



Count of ZIP Code



Count of ZIP Code



Putting Montana Students First **A+**

Comment Summary

Library Media/Information Literacy (n=40)

Summary of “Does Not Support” Comments (n=38)

- Adopt AASL standards with IEFA additions
- Add a standard that emphasizes reading for pleasure and personal interest

Summary of “Supports” Comments (n=2)

- Need more concise standards
- Need more flexible standards

No comments were received that specifically addressed proposed changes to ARM 10.55.1801 Library Media Program Delivery Standards

PROPOSED RULE CHANGES



A thumb held up indicates that I understand and am in agreement with the proposal.



A thumb held sideways indicates that I do not understand the proposal.



A thumb held down indicates that I understand and do not agree with the proposal.

DRAFT PROPOSALS

Content
Standards

- ARM Chapter 53 and 54

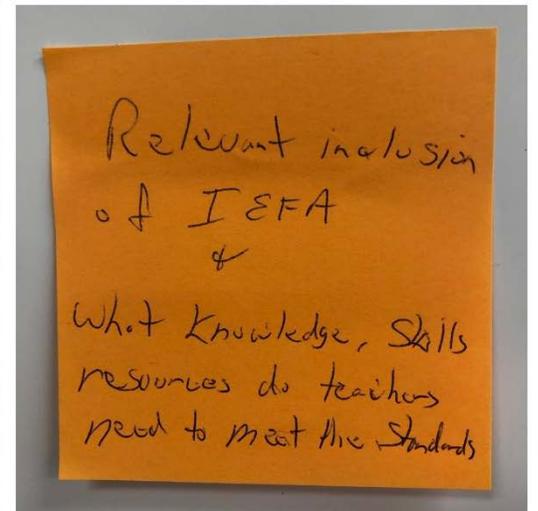
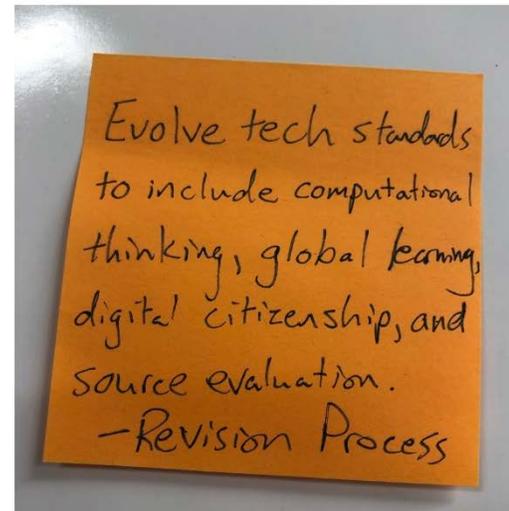
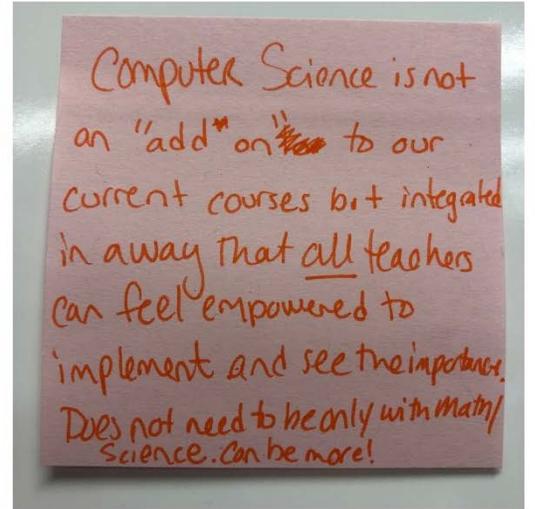
Program Delivery
Standards

- ARM Chapter 55

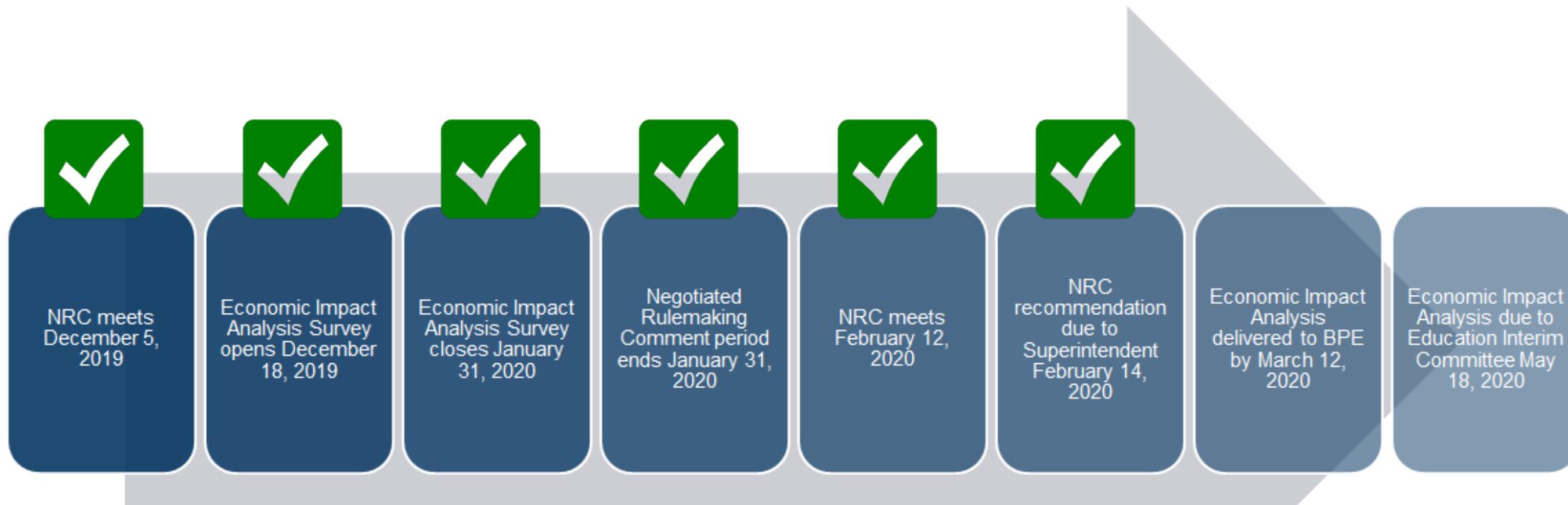
DIGGING IN

Review and Consensus Process

- Library Media/Information Literacy



COMPUTER SCIENCE NRC REVISED TIMELINE



ECONOMIC IMPACT

2-4-405. Economic impact statement.

(2) Except to the extent that the request expressly waives any one or more of the following, the requested statement must include and the statement prepared by the committee may include:

(a) a description of the classes of persons who will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule;

(b) a description of the probable economic impact of the proposed rule upon affected classes of persons, including but not limited to providers of services under contracts with the state and affected small businesses, and quantifying, to the extent practicable, that impact;

(c) the probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenue;

(d) an analysis comparing the costs and benefits of the proposed rule to the costs and benefits of inaction;

(e) an analysis that determines whether there are less costly or less intrusive methods for achieving the purpose of the proposed rule;

(f) an analysis of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule;

(g) a determination as to whether the proposed rule represents an efficient allocation of public and private resources; and

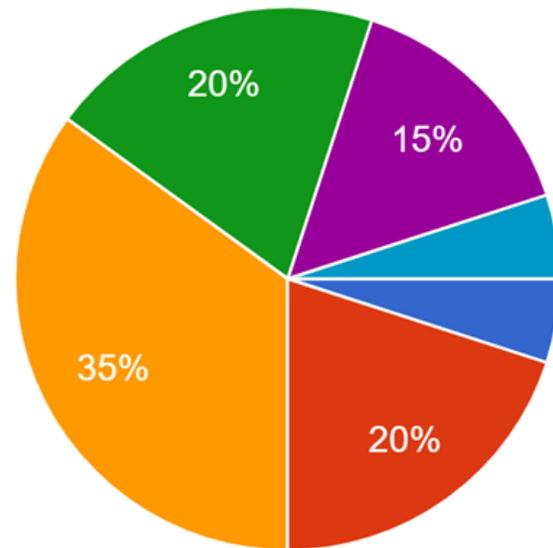
(h) a quantification or description of the data upon which subsections (2)(a) through (2)(g) are based and an explanation of how the data was gathered.

ECONOMIC IMPACT SURVEY

Computer Science

What school size do you represent?

20 responses

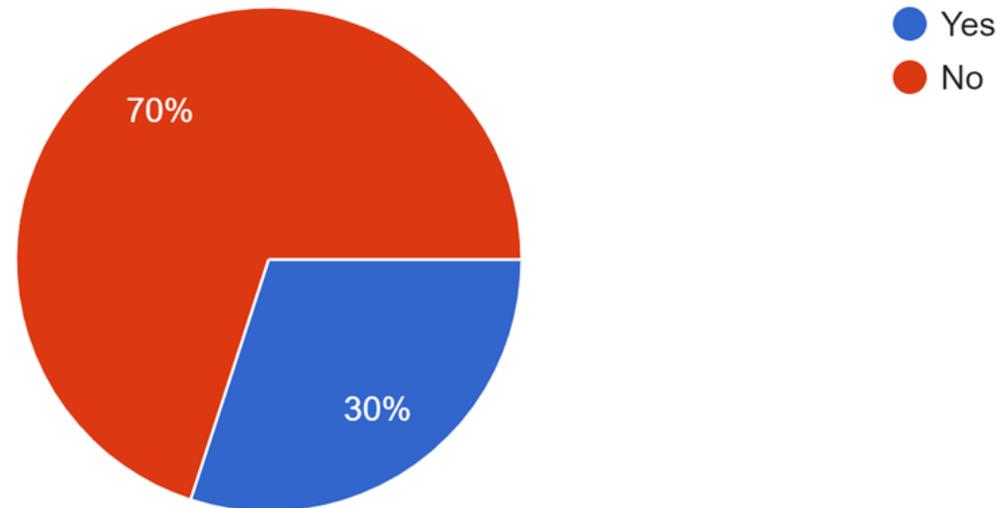


- Small School (fewer than 126 students)
- Class C
- Class B
- Class A
- Class AA
- Multiple districts represented (approximately 12,200 students)

ECONOMIC IMPACT SURVEY

Do you anticipate that your district will be able to implement the proposed standards with existing resources?

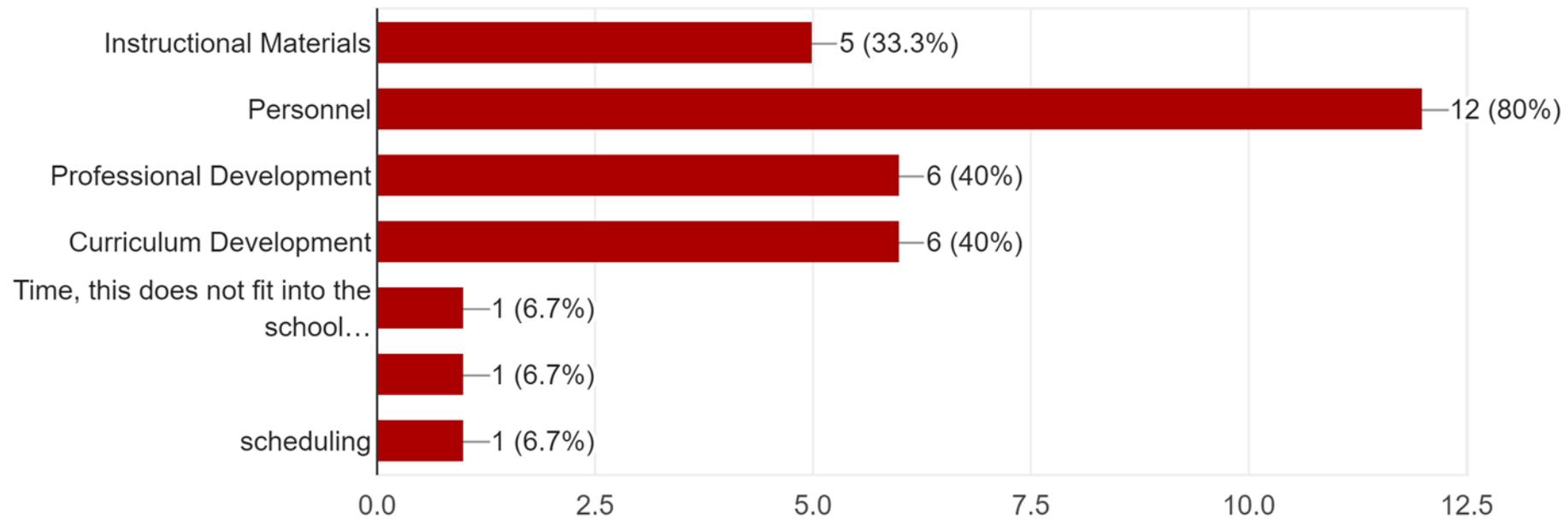
20 responses



ECONOMIC IMPACT SURVEY

If no, what are the two most significant challenges to implementation?

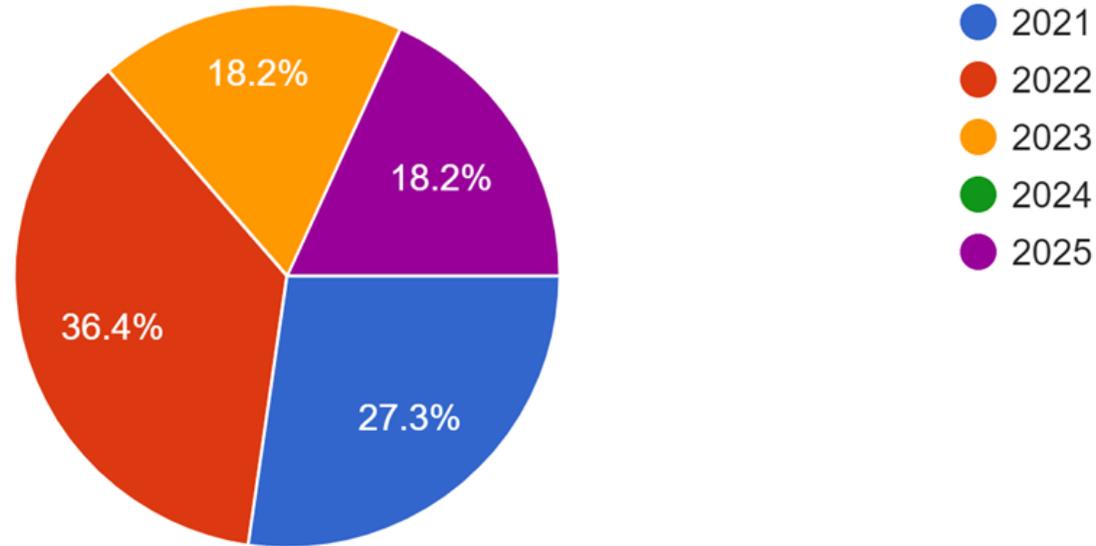
15 responses



ECONOMIC IMPACT SURVEY

What year would your district implement these standards?

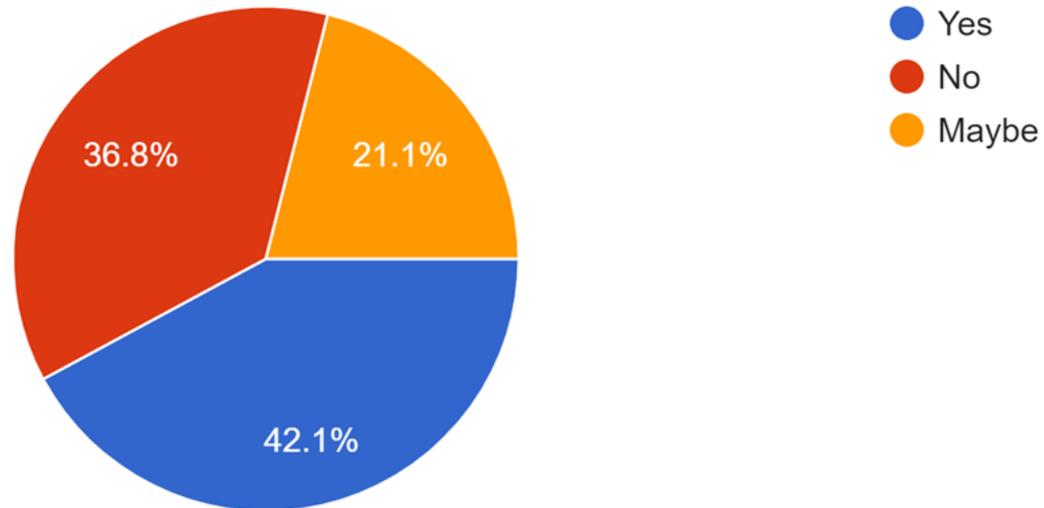
11 responses



ECONOMIC IMPACT SURVEY

Will your district have difficulty finding instructional materials to implement the proposed standards?

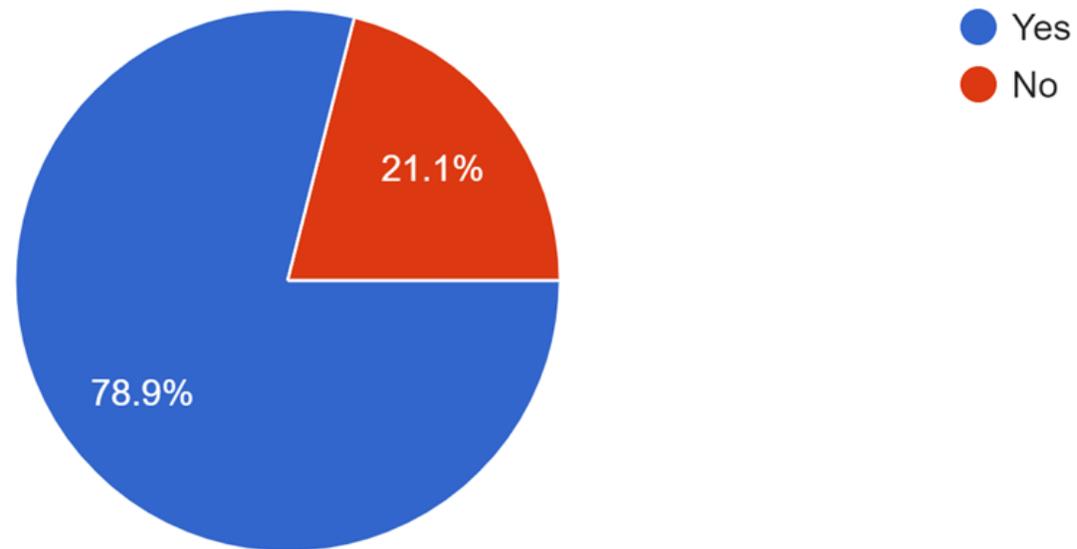
19 responses



ECONOMIC IMPACT SURVEY

Will your district have a shortage of teachers endorsed to teach computer science?

19 responses



ECONOMIC IMPACT SURVEY

What increase in total dollars would be required to cover the cost associated with Instructional Materials? (best estimate)

Answer Range: \$1,200- \$1,000,000

“\$100 per grade K6 and potentially much more than that in a junior high or high school class.”

“About \$25K for equipment and supplies to start a Business Ed. program.”

“\$800k to 1 million. We don't have difficulty in finding the materials, we need funding to support the purchase of updated and ongoing consumables for CTE”

What increase in total dollars would be required to cover the cost associated with professional development?

Answer Range: \$500 to \$100,000*

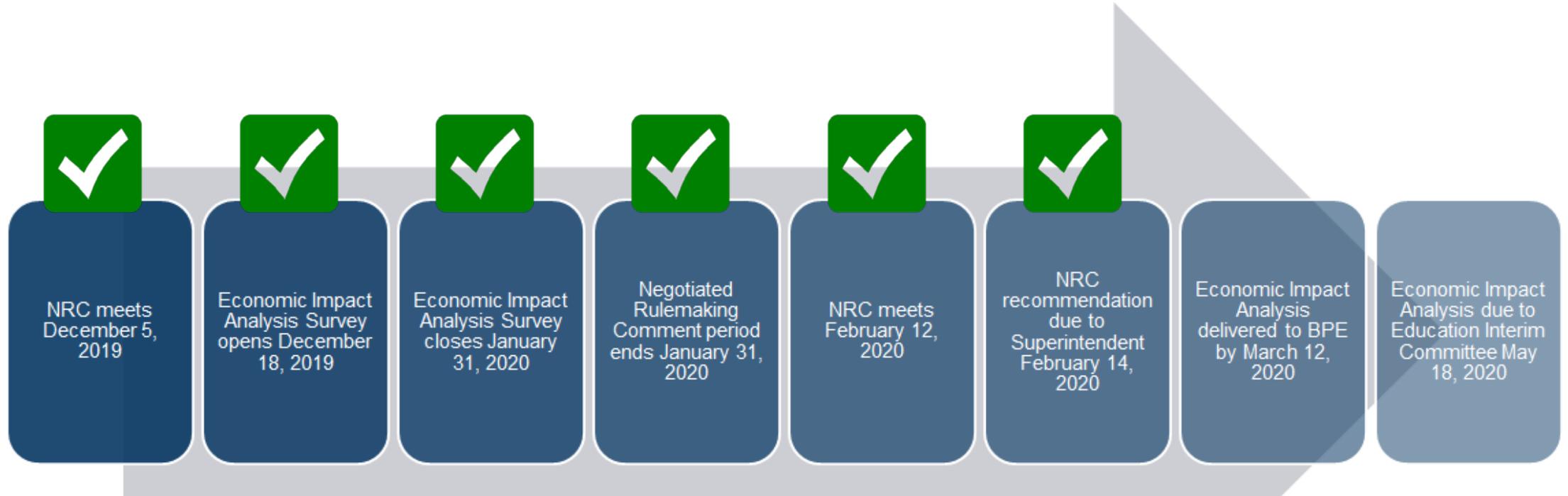
**\$100,000. this includes paying the teacher for their time to attend the training, any certifications associated with the training and CTE field, travel, lodging, etc.*

What increase in total dollars would be required to cover the cost associated with curriculum development?

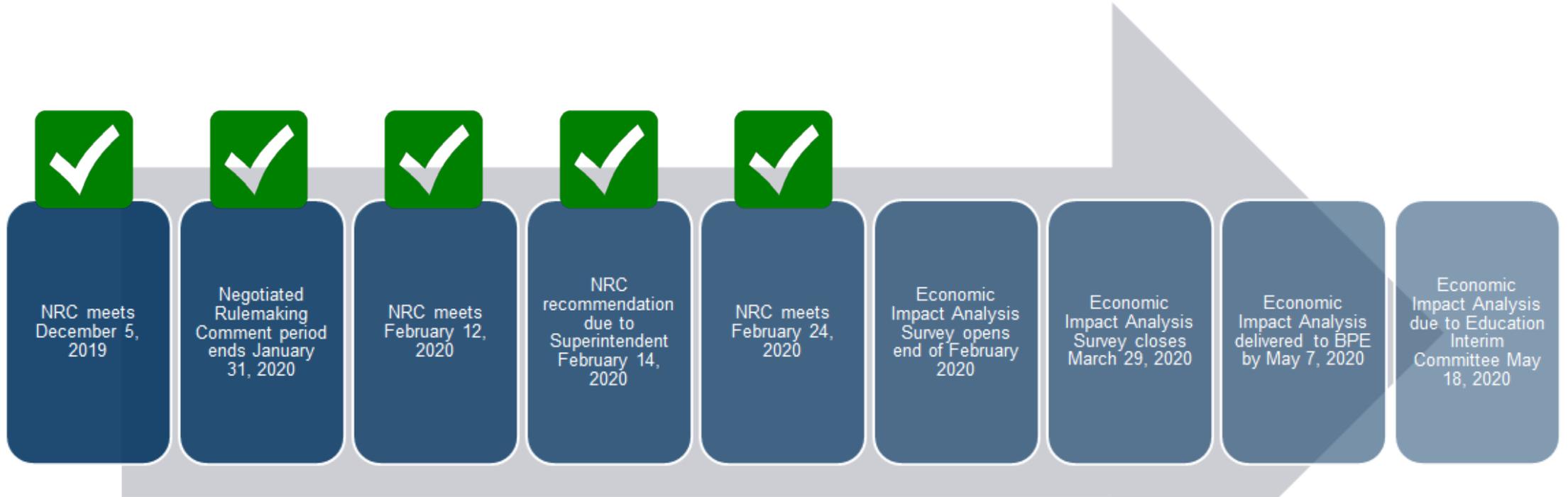
Range: \$400- \$100,000

**That would depend on the interest of the teacher and willingness to learn new areas of application.*

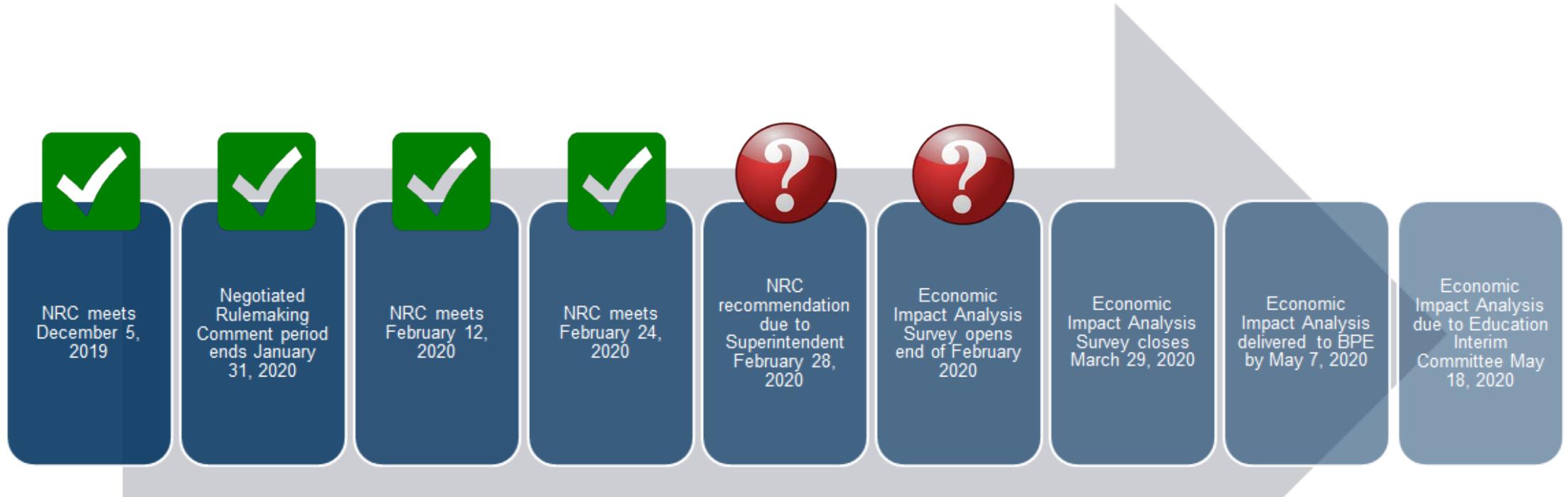
COMPUTER SCIENCE NRC REVISED TIMELINE



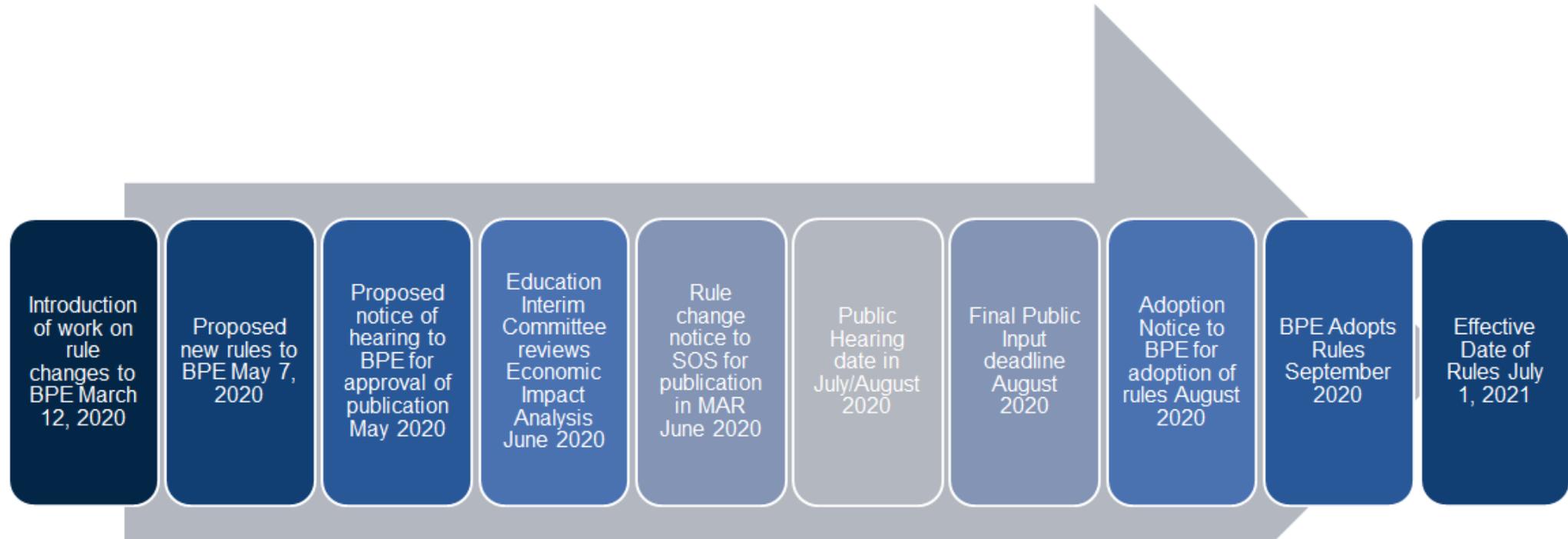
TECHNOLOGY INTEGRATION NRC REVISED TIMELINE



LIBRARY MEDIA/INFORMATION LITERACY NRC REVISED TIMELINE



MAPA PROPOSED TIMELINE



WRAP UP FOR COMMITTEE

Next Meeting:

TBD

PUBLIC COMMENT

Please introduce yourself and spell your last name.

If you are speaking on behalf of an organization, identify the organization and your association with the organization.

KIRSTEN MADSEN

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ADJOURN

**Thank you for your commitment
to Montana Public Education.**

Safe Travels!

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

This revised draft reflects the consensus decisions of the Computer Science, Library Media/Information Literacy, and Technology Integration Negotiated Rulemaking Committee, held on February 12, 2020.

The committee reviewed the draft through page 5 of this document. The committee will resume it's work at 9:00 a.m. on Monday, February 24, 2020, starting on page 6.

Please visit the [OPI K-12 Content Standards and Revision webpage](#) for meeting agenda, minutes, video recording, and other meeting materials.

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INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

1 K-12 LIBRARY MEDIA AND INFORMATION LITERACY CONTENT STANDARDS

2

3 When a district incorporates or integrates library media and information literacy content into
4 district curriculum or offers an elective course in library media and information literacy, the
5 following standards apply:

6 1. build new knowledge by inquiring, thinking critically, identifying problems, and
7 developing strategies for solving problems

8 2. demonstrate an understanding of and commitment to inclusiveness and respect
9 for diversity in the learning community, including the distinct and unique cultural
10 heritage of American Indians

11 3. work effectively with others to broaden perspectives and work toward common
12 goals

13 4. make meaning by collecting, organizing, and sharing resources of personal
14 relevance

15

16 5. exercise freedom to read and demonstrate the ability to pursue personal interests

17 6. demonstrate safe, legal, and ethical creating and sharing of knowledge products

DRAFT

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR KINDERGARTEN
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems
- 4 a. Form simple, factual level questions and begin to explore ways to answer them
- 5 b. Ask "I wonder" questions about topic, question, or problem
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Share knowledge and ideas with others through discussion and listening.
- 10 b. Formulate questions related to content presented by others
- 11 3. Work effectively with others to broaden perspectives and work toward common goals
- 12 a. Listen respectfully and, when appropriate, offer information and opinions in group
- 13 discussions
- 14 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
- 15 a. Express feelings and ideas about a story in different formats
- 16 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 17 a. Routinely select picture, fiction, and information books
- 18 b. Explore new genres
- 19 c. Select books at the appropriate reading level, to be read aloud, or challenging books
- 20 for browsing and enjoyment
- 21 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products
- 22 a. With guidance and support, maintain safe behavior when using the internet

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR FIRST GRADE
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems
- 4 a. Form simple, factual level questions and begin to explore ways to answer them
- 5 b. Ask "I wonder" questions about topic, question, or problem
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Share knowledge and ideas with others through discussion and listening.
- 10 b. Formulate questions related to content presented by others.
- 11 3. Work effectively with others to broaden perspectives and work toward common goals
- 12 a. Listen respectfully and, when appropriate, offer information and opinions in group
- 13 discussions
- 14 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
- 15 a. Express feelings and ideas about a story in different formats
- 16 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 17 a. Request, choose, and share a variety of materials from various genres related to
- 18 personal interests
- 19 b. Select books at the appropriate reading level, to be read aloud, or challenging books
- 20 for browsing and enjoyment
- 21 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products.
- 22 a. With guidance and support, acknowledge the work of others
- 23 b. With guidance and support, maintain safe behavior when using the internet

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR SECOND GRADE
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems.
- 4 a. With guidance and support, generate questions about a topic and select a focal question
- 5 to explore
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Share knowledge and ideas with others through discussion and listening
- 10 b. Formulate questions related to content presented by others
- 11 3. Work effectively with others to broaden perspectives and work toward common goals
- 12 a. Listen respectfully and, when appropriate, offer information and opinions in group
- 13 discussions
- 14 4. Make meaning by collecting, organizing, and sharing resources of personal relevance.
- 15 a. Make connections between literature and personal experiences
- 16 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 17 a. Select books at the appropriate reading level, to be read aloud, or challenging books
- 18 for browsing and enjoyment
- 19 b. Begin to recognize that different genres require different reading, listening, or viewing
- 20 strategies
- 21 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products.
- 22 a. With guidance and support, acknowledge the work of others
- 23 b. With guidance and support, maintain safe behavior when using the internet

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR THIRD GRADE
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems
- 4 a. Ask “why” questions
- 5 b. With guidance, formulate a question about a topic
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Articulate and identify one’s own place in the cultural fabric of the global community
- 10 and respect others’ cultural identities
- 11 b. With guidance, seek sources written by authors with diverse backgrounds
- 12 3. Work effectively with others to broaden perspectives and work toward common goals
- 13 a. Reflect at the end of the inquiry process and identify new or related ideas that would
- 14 be interesting to pursue
- 15 b. Explore print, digital, and other resources to find information on a topic of personal
- 16 interest
- 17 c. Work in teams to produce original works or solve problems
- 18 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
- 19 a. Make a list of all the possible sources of information that will help answer the
- 20 questions or an information need
- 21 b. Use text features and illustrations to decide which resources are best to use and why
- 22 ~~Discover and innovate through experience and reflection~~
- 23 a. Create learning products for a variety of audiences and purposes
- 24 b. Use technology tools for independent and collaborative publishing activities
- 25 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 26 a. Read, listen to, and view a range of resources for a variety of purposes (e.g., live the
- 27 experiences of a character, answer questions, learn something new, explore
- 28 personal interests)
- 29 b. Recognize features of various genres and use different reading strategies for
- 30 understanding
- 31 c. Connect personal feelings to emotions, characters, and events portrayed in a literary
- 32 work
- 33 d. Set reading goals
- 34 e. Demonstrate knowledge of favorite authors and genres
- 35 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products
- 36 a. With guidance and support, use technology appropriately by avoiding plagiarism and
- 37 citing information
- 38 b. Articulate personal consequences of inappropriate use of information, technology,
- 39 and media
- 40 c. With support, use digital tools responsibly by protecting personal information and
- 41 respecting the privacy of others

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR FOURTH GRADE
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems
- 4 a. Ask “why” questions
- 5 b. With guidance, formulate a question about a topic
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Articulate and identify one’s own place in the cultural fabric of the global community
- 10 and respect others’ cultural identities
- 11 b. With guidance, seek sources written by authors with diverse backgrounds
- 12 3. Work effectively with others to broaden perspectives and work toward common goals
- 13 a. Reflect at the end of the inquiry process and identify new or related ideas that would
- 14 be interesting to pursue
- 15 b. Explore print, digital, and other resources to find information on a topic of personal
- 16 interest
- 17 c. Work in teams to produce original works or solve problems
- 18 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
- 19 a. Make a list of all the possible sources of information that will help answer the
- 20 questions or an information need
- 21 b. Use text features and illustrations to decide which resources are best to use and why
- 22 ~~Discover and innovate through experience and reflection~~
- 23 a. Create learning products for a variety of audiences and purposes.
- 24 b. Use technology tools for independent and collaborative publishing activities.
- 25 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 26 a. Read, listen to, and view a range of resources for a variety of purposes (e.g., live the
- 27 experiences of a character, answer questions, learn something new, explore
- 28 personal interests)
- 29 b. Recognize features of various genres and use different reading strategies for
- 30 understanding
- 31 c. Connect personal feelings to emotions, characters, and events portrayed in a literary
- 32 work
- 33 d. Set reading goals
- 34 e. Demonstrate knowledge of favorite authors and genres
- 35 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products.
- 36 a. With guidance and support, use technology appropriately by avoiding plagiarism and
- 37 citing information
- 38 b. Articulate personal consequences of inappropriate use of information, technology,
- 39 and media
- 40 c. With support, use digital tools responsibly by protecting personal information and
- 41 respecting the privacy of others

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR FIFTH GRADE
- 2 1. Build new knowledge by inquiring, thinking critically, identifying problems, and developing
- 3 strategies for solving problems
- 4 a. Ask “why” questions
- 5 b. With guidance, formulate a question about a topic
- 6 2. Demonstrate an understanding of and commitment to inclusiveness and respect for diversity
- 7 in the learning community, including the distinct and unique cultural heritage of American
- 8 Indians
- 9 a. Articulate and identify one’s own place in the cultural fabric of the global community
- 10 and respect others’ cultural identities
- 11 b. With guidance, seek sources written by authors with diverse backgrounds
- 12 3. Work effectively with others to broaden perspectives and work toward common goals
- 13 a. Reflect at the end of the inquiry process and identify new or related ideas that would
- 14 be interesting to pursue
- 15 b. Explore print, digital, and other resources to find information on a topic of personal
- 16 interest
- 17 c. Work in teams to produce original works or solve problems
- 18 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
- 19 a. Make a list of all the possible sources of information that will help answer the
- 20 questions or an information need
- 21 b. Use text features and illustrations to decide which resources are best to use and why
- 22 ~~Discover and innovate through experience and reflection~~
- 23 a. Create learning products for a variety of audiences and purposes.
- 24 b. Use technology tools for independent and collaborative publishing activities.
- 25 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 26 a. Read, listen to, and view a range of resources for a variety of purposes (e.g., live the
- 27 experiences of a character, answer questions, learn something new, explore
- 28 personal interests)
- 29 b. Recognize features of various genres and use different reading strategies for
- 30 understanding
- 31 c. Connect personal feelings to emotions, characters, and events portrayed in a literary
- 32 work
- 33 d. Set reading goals
- 34 e. Demonstrate knowledge of favorite authors and genres
- 35 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products
- 36 a. With guidance and support, use technology appropriately by avoiding plagiarism and
- 37 citing information
- 38 b. Articulate personal consequences of inappropriate use of information, technology,
- 39 and media
- 40 c. With support, use digital tools responsibly by protecting personal information and
- 41 respecting the privacy of others
- 42

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR SIXTH THROUGH
2 EIGHTH GRADE
- 3 1. Build new knowledge by inquiring, thinking critically, identifying problems, and
4 developing strategies for solving problems
 - 5 a. Write questions independently based on key ideas or areas of focus
 - 6 b. Refine questions based on the type of information needed
 - 7 c. Pose questions that focus on “How do we know what we know?”
 - 8 2. Demonstrate an understanding of and commitment to inclusiveness and respect for
9 diversity in the learning community, including the distinct and unique cultural heritage of
10 American Indians
 - 11 a. Offer information and opinions at appropriate times in group discussions
 - 12 b. Encourage others to share ideas and opinions
 - 13 c. Accurately describe or summarize the ideas of others
 - 14 3. Work effectively with others to broaden perspectives and work toward common goals
 - 15 a. Ask questions of others in a group to elicit their information and opinions
 - 16 b. Seek more than one point of view by using diverse sources
 - 17 c. Read with purpose to investigate new ideas for classroom learning and
18 personal exploration
 - 19 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
 - 20 a. Determine what information is needed to support an investigation and answer
21 questions
 - 22 b. Refine questions depending on the type of information needed (e.g.,
23 overview, big idea, specific detail, cause and effect, comparison)
 - 24 c. Seek opportunities to explore personal interests and questions
 - 25 ~~Discover and innovate through experience and reflection~~
 - 26 a. Create products that incorporate writing, visuals, and other forms of media to
27 convey message and main points.
 - 28 b. Experiment with various types of technology tools for artistic and personal
29 expression.
 - 30 c. Share reading, listening, and viewing experiences in a variety of ways and
31 formats.
 - 32 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
 - 33 a. Independently locate and select information for personal, hobby, or vocational
34 interests
 - 35 b. Read, listen to, and view an increasingly wide range of genres and formats for
36 recreation and information
 - 37 c. Respond to images and feelings evoked by a literary work
 - 38 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products
 - 39 a. With support, provide reference citations for all direct quotations and cite
40 sources
 - 41 b. With support, select and use digital tools and websites appropriately
 - 42 c. Avoid plagiarism by rephrasing information in one’s own words

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

1 LIBRARY MEDIA AND INFORMATION LITERACY STANDARDS FOR NINTH THROUGH 2 TWELFTH GRADE

- 3 1. Build new knowledge by inquiring, thinking critically, identifying problems, and
4 developing strategies for solving problems
 - 5 a. Formulate essential questions through reading, constructing hypotheses,
6 research questions, and thesis statements
 - 7 b. Refine questions to provide a framework for an inquiry and to fulfill the purpose
8 of the research
 - 9 c. Design questions that systematically test a hypothesis or validate a thesis
10 statement
 - 11 d. Develop questions that require making connections between ideas and events
- 12 2. Demonstrate an understanding of and commitment to inclusiveness and respect for
13 diversity in the learning community, including the distinct and unique cultural heritage of
14 American Indians
 - 15 a. Share relevant information to contribute to the learning of others through
16 discussions and presentations
 - 17 b. Contribute opinions and supporting evidence to group deliberations
 - 18 c. Listen to opinions and evidence of others
 - 19 d. Ask and respond to questions in group exchanges of ideas
 - 20 e. Identify the value of and differences among potential resources and differing
21 points of view
 - 22 f. Actively seek the opinions of others and contribute positively to an environment
23 in which all participants' ideas are shared and valued
- 24 3. Work effectively with others to broaden perspectives and work toward common goals
 - 25 a. Seek ideas and opinions from others
 - 26 b. Describe ideas of others accurately
 - 27 c. Participate in discussions to analyze information problems to suggest solutions
 - 28 d. Work with others to select, organize, and integrate information and ideas from
29 a variety of sources and formats
 - 30 e. Seek consensus from a group, when appropriate, to achieve a stronger product
 - 31 f. Apply conclusions or decisions to new situations
 - 32 g. Model social skills that advance a team's ability to identify issues and problems
33 and work on solutions
 - 34 h. Work with others to solve problems and make decisions on issues, topics, and
35 themes being investigated
- 36 4. Make meaning by collecting, organizing, and sharing resources of personal relevance
 - 37 a. Review the initial information need to clarify, revise, or refine the questions
 - 38 b. Recognize that the purpose of an inquiry determines the type of questions and
39 thinking required (e.g., defend a position in an historical context, design
40 questions to test a hypothesis)
 - 41 c. Generate specific questions to focus the purpose of the research
 - 42 d. Refine questions to provide a framework for the inquiry and to fulfill the
43 purpose of the research
 - 44 e. Independently pursue answers to self-generated questions
 - 45 f. Explore problems or questions for which there are multiple answers

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS

ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

- 1 ~~Discover and innovate through experience and reflection~~
- 2 a. Assess emotional impact of specific works on the reader or viewer.
- 3 b. Express ideas through creative products in multiple formats using a variety of
- 4 technology tools.
- 5 c. Select presentation format to effectively communicate and support a purpose,
- 6 argument, point of view, or interpretation
- 7 d. Connect universal themes and ideas presented in various formats to the human
- 8 experience.
- 9 e. Create original products using a variety of technology tools to express personal
- 10 learning.
- 11 f. Use the most appropriate format to clearly communicate ideas to targeted
- 12 audiences.
- 13 5. Exercise freedom to read and demonstrate the ability to pursue personal interests
- 14 a. Select print, non-print, and digital materials based on personal interests and
- 15 knowledge of authors
- 16 b. Read, listen to, and view information in a variety of formats to explore new
- 17 ideas, form opinions, solve problems, and to connect to real-world issues
- 18 c. Routinely read, view, and listen for personal enjoyment, in order to learn, solve
- 19 problems, and explore different ideas
- 20 d. Read widely to develop a global perspective and understand different cultural
- 21 contexts
- 22 e. Actively preserve the rights of self and others to express ideas freely and pursue
- 23 the right to read, view and listen
- 24 6. Demonstrate safe, legal, and ethical creating and sharing of knowledge products
- 25 a. Follow fair use guidelines for text, visuals, and music in generating products
- 26 and presentations
- 27 b. Practice responsible use of technology and describe personal consequences
- 28 of inappropriate use
- 29 c. Demonstrate understanding of plagiarism by paraphrasing information or noting
- 30 direct quotes
- 31 d. Credit all sources properly
- 32 e. Respect privacy of others

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

1 LIBRARY MEDIA SERVICES, K-12 [10.55.709](#)

Current ARM	Recommendation	Modification
(1) The school library shall be housed in a central location, and each school shall have a licensed and endorsed library media specialist at the following ratio:	keep as is	
(a) 5 FTE for schools with 126-250 students;	keep as is	
(b) 1 FTE for schools with 251-500 students;	keep as is	
(c) 1 5 FTE for schools with 501-1000 students;	keep as is	
(d) 2 FTE for schools with 1001-1500 students;	keep as is	
(e) 2 5 FTE for schools with 1501-2000 students;	keep as is	
(f) 3 FTE for schools with 2001 or more students	keep as is	
(2) Schools of fewer than 126 students shall employ or contract with a licensed and endorsed school library media specialist	keep as is	
(3) If a district has fewer than 126 students, the district may utilize a consortium, multidistrict agreement, or interlocal cooperative to secure these services	keep as is	

2

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

1

LIBRARY MEDIA PROGRAM DELIVERY STANDARDS [10.55.1801](#)

Current ARM	Recommendation	Modification
(1) In general, a basic program in library media shall:		
(a) meet the following conditions:		
(i) establish flexible scheduling to ensure that libraries respond to information needs, foster intellectual curiosity, and support learning;	modify	(i) establish flexible appropriate scheduling, fixed or flexible, to ensure that libraries respond to information needs, foster intellectual curiosity, and support learning;
(ii) ensure collaboration with classroom teachers of all disciplines to implement content area standards and to assist students in engaging in the inquiry/research process;	keep as is	
(iii) model and support the ethical use of information, adherence to copyright laws, and respect for intellectual property; and	keep as is	
(iv) advise the board of trustees on policy and rule pertaining to:	keep as is	
(A) developing and maintaining a library collection that is current, balanced, and reflects authentic historical and cultural contributions of Montana's American Indians and other minority and ethnic groups;	modify	(A) developing and maintaining a physical and digital library collection that is current, balanced, and reflects authentic historical and cultural contributions of Montana's American Indians and other minority and ethnic groups;
(B) engaging in comprehensive long range planning to administer and manage, in a secure area, the human, financial, and physical resources of the library to locate, access, and use on-site resources that are organized and cataloged; and	modify	(B) engage ing in comprehensive long range planning to administer and manage, in a secure area, the human, financial, digital, and physical resources of the library to locate, access, and use on-site resources that are organized and cataloged; and

INFORMATION LITERACY/LIBRARY MEDIA STANDARDS

ALTERNATIVE PROPOSAL DRAFT FOR NRC 2.24.2020

Current ARM	Recommendation	Modification
(C) implementing a viable collection development policy which includes the following components:	modify	(C) implementing a viable collection development policy which includes the following components:
(I) materials selection and de-selection;	keep as is	
(II) challenged materials procedure;	keep as is	
(III) intellectual/academic freedom statement;	keep as is	
(IV) confidentiality assurance;	keep as is	
(V) copyright guidelines; and	keep as is	
(VI) gifts and donations	keep as is	
(b) include the following practices:		
(i) collaborate with classroom teachers of all disciplines to highlight and reinforce the commonalities and links between and among the curricular areas;	keep as is	
(ii) cooperate and join with other libraries, information agencies, and community resources in the sharing of materials;	keep as is	
(iii) encourage partnerships with information centers that use electronic information systems; and	modify	(iii) encourage partnerships with information centers that use providers of digital electronic content and information systems; and
(iv) participate in school-wide technology and telecommunications planning and promote its integration into all instructional programs	modify	(iv) participate in school-wide technology and telecommunications digital service and content planning and promote its integration into all instructional programs

Computer Science Standards Economic Impact Report

DRAFT SUMMARY

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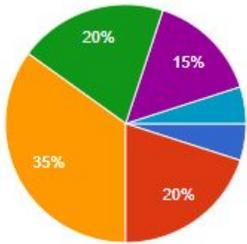
Computer Science Economic Impact Survey	3
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*Note: This is a summary of the Economic Impact Survey. Not all questions or written responses are included.

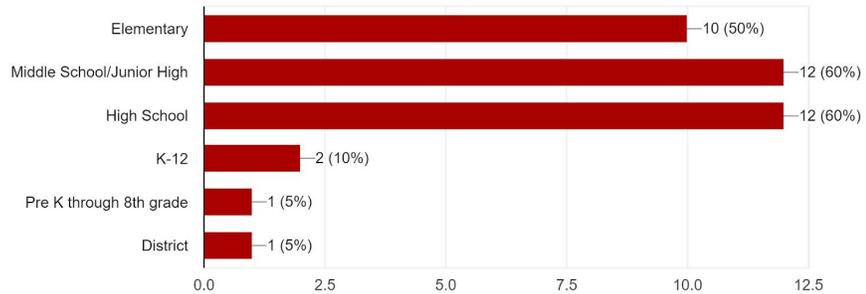
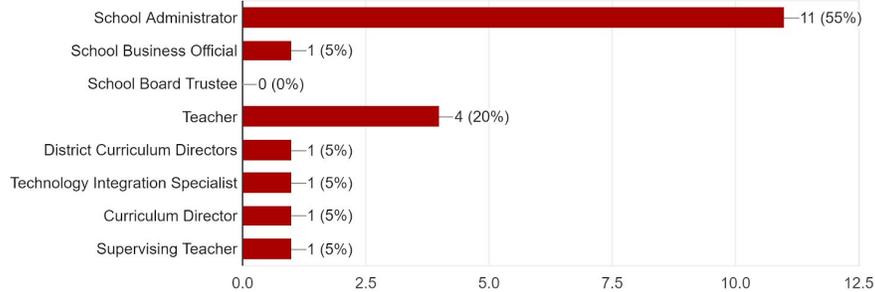
Computer Science Economic Impact Survey

Survey Demographics (n=20*)

*many of the questions were optional



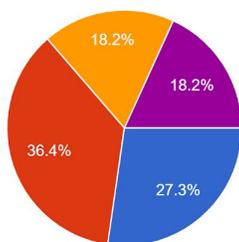
- Small School (fewer than 126 students)
- Class C
- Class B
- Class A
- Class AA
- Multiple districts represented (approximately 12,200 students)



Content Standards Implementation

Question	Yes	No
Do you anticipate that your district will be able to implement the proposed standards with existing resources?	6 (30%)	14 (70%)
Will your district be able to implement the proposed program delivery standards for computer science?	8 (40%)	12 (60%)

What year would your district implement these standards?
11 responses



- 2021
- 2022
- 2023
- 2024
- 2025

Personnel was the most significant challenge to implementation with all 12 voting “no” to the program delivery standards selecting personnel as one of the most significant challenges to implementation. Additional concerns are: *“this does not fit into the school day for teachers or students”*

"We have a small school with a small, unique populations, due to factors beyond student control, many are below grade level and much of our time as teachers is spent not only teaching current core standards, but attempting to fill gaps students have. I struggle with finding enough time in the day to teach the current standards, I will not be able to teach additional standards due to time and achievement gaps from my students previous years in education."

Instructional Materials

Question	Yes	No	Maybe
Will your district have difficulty finding instructional materials to implement the proposed standards? n=19	8 (42.1%)	7 (36.8%)	4 (21.1%)

"There is plenty on the market available for CS both free and inexpensive. The question will be if those resources are ongoing digital subscriptions based on number of students or site licenses."

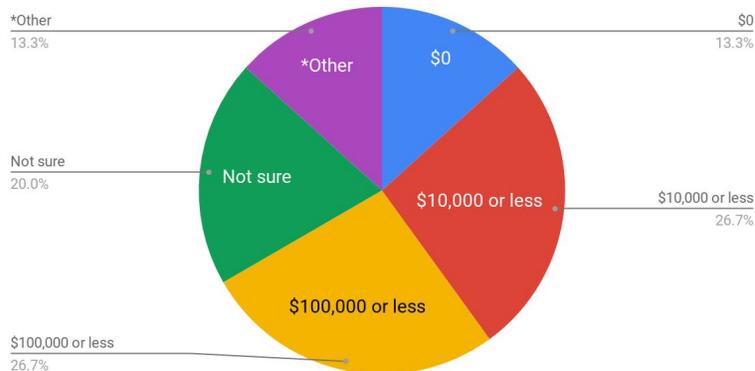
"Cost is the technology: code.org is free and meets all these but we don't have the time to add it to the day at the K-5 level, and 6-12 we can't afford FTE"

"We are using and will continue to use PLTW as a mechanism for computer science"

"Finding will not likely be a problem. Affording is very likely to be. Also, some of the standards appear to require hardware and programming tools and materials that no one on my team is prepared to use."

"It may be challenging to find materials that cover these standards specifically because they are so general and do not include a progression of skills such as keyboarding proficiency levels and being able to use specific programs at various grade levels."

What increase in total dollars would be required to cover the cost associated with Instructional Materials? (best estimate)



***"1500 per year Code HS" and "300,000 every three years to rotate out Chromebooks. We have 16,000 students and they would each need access to technology of some sort."*

Personnel

Question	Yes	No	Maybe (if option)
Does your district have a shortage of teachers endorsed in computer science?	15 (78.9%)	4 (21.1%)	

Summary of if answered “no” or “maybe” feedback:

“Computer Science is not currently an endorsement in MT. It is my understanding that all can teach it.”

“This is a difficult question that needs further clarifications at both K-8 and High School. High school we can use business and tech-ed teachers but we have shortages in both those areas as well. If we are adding a CS program of study in the K-8, what are the requirements?”

How many new hires would be needed? n=14	Count	What increase in total dollars would be required to cover the cost associated with Personnel?
0	3	none
1	8	\$40,000-\$75,000
2	1	\$90,000
10	1	\$500,000
32	1	\$250,000

Professional Learning

Question	Yes	No	Maybe (if option)
Will your district have difficulty finding professional development opportunities for computer science educators?	6(35.3%)	11(64.7%)	

Summary if answered “yes”

“The UM/MSU summer CS PD will be ending this summer. No opportunities after that.”

“Rural location makes it difficult to receive professional development in this area.”

“We need to train teachers in computer science to deliver the content and assess learning”

“There are numerous professional development opportunities on the Learning Hub, Region III and Region I.”

“The problem wouldn’t necessarily be finding PD for computer science educators, it would be finding computer science educators. My instinct is that people with CS degrees will not likely be in the education field.”

What professional development would be needed?

“code.org can provide the K-12 support. It will be up to the district to decide the system but it could be fulfilled with code.org”

“Train the trainer model through PLTW”

“There are a lot of options online for Professional Development. We currently use the online system.”

“First, we would establish curriculum materials, hardware, and software, then there would be the task of teaching our current educators how to use it and how to instruct with it. Assessment would be very difficult because establishing a baseline for showing mastery of each individual standard would be difficult to pioneer.”

“Level 1 Awareness on new standards and the pedagogy required to implement them. Level 2 Resources and implementation of new curriculum Level 3 Proficiency Based Assessments towards those standards.”

Curriculum Development

Question	Yes	No	Maybe (if option)
Would the proposed standards, if adopted, require your district to substantially revise its current curriculum?	9(47.4%)	4(21.1%)	6(31.6%)

Summary if answered “yes”

“This would require a great deal of time. Time would need to come from within the school year with PIR time allowed to work on this.”

“At the K-5 level we do not have time or money to implement. 6-8 this is doable.”

“Because it has been a long time since many of our districts worked on computer science curriculum, it is possible that these standards would cause substantial revisions. Some districts I represent would likely not have to make changes, while others would.”

“We are a small school. We do not have Computer Science as a part of our curriculum at this time, nor do we foresee adding this course to our course offering here at the school.”

“Regardless of how we integrate the standard, time will be a major fact. If we had a devoted computer science teacher it would mean sacrificing another elective (music, art, etc.) . If we taught it with our current staff, it would steal minutes from core classes.”

“The area of greatest impact will be the K-5 level, but even middle and high school teachers will need to meet and revise what we are currently doing for computer programming. These new standards go above and beyond that.”

General Feedback

“The addition of these new CS standards will help to delineate the grade-level requirements, but the overlap to the forthcoming Technology and Media Literacy standards revisions need to be looked over as a whole.”

I am unable to answer many of the questions as we do not have computer science as a course and do not plan on adding in the near future. If students are interested in this topic area, we offer MDA Computer Science online.

DRAFT SUMMARY Updated: February 21,2020

There are no teachers endorsed in this area, nor is there room in the master schedule for adding another course. We are struggling with maintaining our core courses, electives (to include CTE varieties).

“These standards do not address a progression of skills at developmental age levels (with a few exceptions); therefore, districts will have a greater economic impact in developing and implementing local curriculum guides than they would if these provided more specific guidance. It would be better if these standards more closely aligned with national level expectations for things such as keyboarding proficiency and working knowledge of word processing programs, etc. “

“This is going to be a difficult position for any smaller Class C school to fill. We do the best we can with other subjects and including aspects where applicable and we readily use MTDA and Odysseyware whenever possible to help our students with this area of study. “

*“I love computer science and hope all children are computer literate but an **unfunded mandate** will be nearly impossible to fulfill. Additionally, at the K-5 level our kids and teachers have very limited time to add anything to the day with testing and behavior issues eating up the majority of extra time. “*

*“Teachers have limited **time** available to work on this. Districts are hesitant to give time for this to happen, which means that teachers either have to use their personal time or choose not to complete the work. Time must be allocated during the school year.”*

“Teaching CS is not a PD thing, no more that the training to be a math or science teacher can be done with PD. There needs to be content courses and methods courses offered at the universities. It cannot be a point at a willing teacher and say "your it". Course work needs to be developed to train CS teachers. None of the universities in Montana seem inclined to do so. No teachers qualified to teach CS means this whole curriculum is sort of a dead end. Qualified teachers cannot be made with just PD.”

Montana Computer Science Cost Estimate from Code.org

This spreadsheet below approximates the one-time cost of expanding access to computer science to offer a basic K-12 pathway in every school in a state. This does not model teacher attrition or long-term costs. Once teachers are established, existing state/federal funding streams should address this issue.

Assumptions/limitations:

- The cost to establish a computer science program is based on preparing an in-service teacher, NOT hiring a new teacher.
- The major grade bands where teachers will be established are K-6 (elementary), 7-8 (middle school), 9-12 (high school) and uses NCES data (school year '14/'15, which is the most recent year) to determine how many unique schools each state has in these grade bands
- This model assumes establishing one teacher per grade major grade band at a school using NCES data for number of unique schools at each grade band. For example, if a school has both K-6 grades and middle school grades, then the model will assume establishing two teachers. It also assumes that one K-6 teacher (such as technology teacher that reaches all students or a librarian) will be established per school. This figure may need to be adjusted (which is supported below) if states/districts want to establish more than one elementary school teacher per school.
- Only Public and Public Charter School Districts would be eligible for this funding.
- The model assumes some cost overhead compared to the work of private organizations such as Code.org

Approximate number of public/charter elementary schools	449
Approximate number of public/charter middle/high schools	503
Approximate % of schools that don't teach CS	55%
Assumption of number of teachers/elementary school	1
Assumption of number of teachers/middle/high school school	1
Number of new elementary school CS teachers needed	247
Number of new middle/high school CS teachers needed	277
Cost to an elementary school to establish a CS teacher	\$500
Cost to establish a middle or high school CS teacher	\$6,000
Total cost: elementary school	\$123,475
Total cost: middle/high school	\$1,659,900
TOTAL COST	\$1,783,375
Total new CS classrooms	524



Montana

1	2	3
State Plan	Standards	Funding
No	In Progress	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	Yes	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	District Decision	No

Refer to advocacy.code.org for additional up-to-date information.

Updates

- The state began development of K-12 computer science standards in July 2018.
- The state passed a permissive and encouraging policy to allow computer science to count as a science, mathematics, elective, or CTE graduation requirement. Alternatively, a district may increase the local requirements in math, science, or career and technical education and allow a computer science course to fulfill one of the required credits, or require all students to complete a computer science credit.
- Governor Steve Bullock is a member of the Governors' Partnership for K-12 Computer Science.

Data

- In the 2018–2019 school year, 45% of high schools taught at least one computer science course, compared to 40% in 2017–2018.
- 6 schools (6% of schools with AP programs) offered an audited AP computer science course in 2017–2018, which is 4 more schools than the previous year.
- 7 female students (18%) took an AP CS exam in 2018, compared to 2 (15%) in 2017.
- 1 underrepresented minority student (3%) took an AP CS exam in 2018, compared to 2 (15%) in 2017.
- 99 bachelor's degrees in computer science were earned in 2017; 11% were female.

2019 State of Computer Science Education Equity and Diversity, advocacy.code.org

Montana Computer Science Coding Endorsement and Core Graduation

[Frequently Asked Questions: Computer Science in High School Graduation Requirements](#)- March 5, 2019

[Computer Science Opportunities to Satisfy a Core Graduation Requirement](#)- March 5, 2019

Question: What are the teacher licensure requirements for a student to fulfill a credit requirement in another subject area through a computer science course? Must the teacher hold a licensure or endorsement in the subject area AND computer science?

Answer: If a district chooses to allow a computer science course to fulfill a mathematics, science, CTE or technology credit, the district must ensure the course is taught by an appropriately licensed teacher. For example, if a computer science course is assigned a mathematics course code, the teacher must hold current grade-level and subject area licensure in mathematics.

The Montana Board of Public Education recently created a high-quality pathway to certification in teaching computer science content. Specifically, ARM 10.57.421, as amended by 2018 rulemaking, permits an individual to obtain an endorsement on the Class 4 license to teach the following courses if s/he holds the qualifications below:

10.57.421 CLASS 4 ENDORSEMENTS

For health science education, engineering, computer information systems, computer coding, teacher education, EMT, or fire and disaster services, an alternative to the above requirement of 10,000 hours of work experience may be substituted as recognized by the Office of Public Instruction and the Board of Public Education as follows:

(c) For computer information systems an individual may provide verification of completion of an approved technical program in a recognized training institution and hold a professional license or industry standard certificate recognized by the Office of Public Instruction and the Board of Public Education.

(d) For computer coding:

(i) hold a Class 1 or 2 license; and

(ii) provide verification of successful completion of a blended learning professional development course of at least 80 hours by a provider recognized by the Office of Public Instruction and the Board of Public Education.

Question: What credit requirement(s) may a local board of trustees allow a computer science course to fulfill?

Answer: A computer science course that is assigned the appropriate course code and taught by an appropriately credentialed instructor may fulfill any of the following:

DRAFT SUMMARY Updated: February 21,2020

1. *A credit requirement in mathematics*
2. *A credit requirement in science*
3. *A local elective requirement*
4. *A local career and technical education (or technology) requirement*
5. *A stand-alone computer science credit requirement.*

Question: What are the teacher licensure requirements for a student to fulfill a credit requirement in another subject area through a computer science course? Must the teacher hold a licensure or endorsement in the subject area AND computer science?

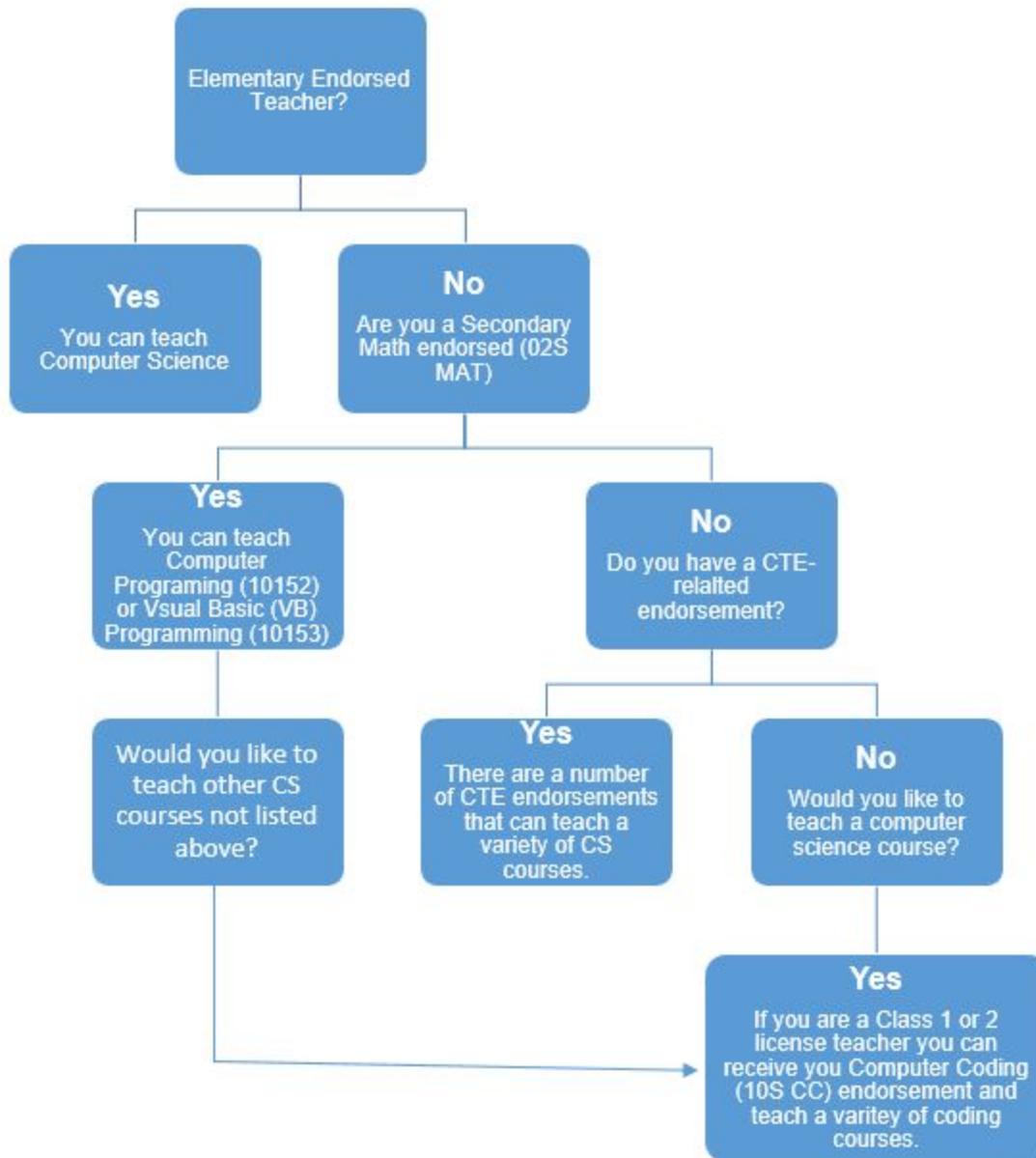
Answer: If a district chooses to allow a computer science course to fulfill a mathematics, science, CTE or technology credit, the district must ensure the course is taught by an appropriately licensed teacher. For example, if a computer science course is assigned a mathematics course code, the teacher must hold current grade-level and subject area licensure in mathematics.

Question: What course code requirements apply if a computer science course fulfills a local credit requirement in another subject, such as mathematics, science, or career and technical education?

Answer: Per ARM 10.55.911, a student's high school transcript must include the course code and credits earned for each course taken. This means that if a district chooses to allow a computer science course to fulfill a mathematics, science, CTE or technology credit, the school or district must:

- *Assign an appropriate course code for the subject area to which graduation credit will be applied (i.e., assign a math course code if the computer science course will be allowed to fulfill a math credit requirement).*
- *Denote on the student transcript that the student has met the applicable subject area requirement by completing a computer science course.*

Who Can Teach Computer Science Courses in Montana



[CTE endorsements](#)

[Variety of CS courses \(p.42\)](#)

[Computer Coding section 4d](#)

2018-2019 Computer Science Course Data (TEAMS)

Prior to Secondary (PTS)

Prior to Secondary (PTS) Category	Number
Number of PTS Computer Science Courses	771
Total Enrollment of PTS Computer Science Courses	13,170
School Systems with PTS Computer Science Courses	105
Schools with PTS Computer Science Courses	134
Number of PTS Computer Science Teachers/Facilitators	139
PTS Computer Science Course Codes Available	7
PTS Computer Science Course Codes Used	7

Course Code	Prior to Secondary Computer Science Courses	Courses	Enrollment
60001	Introduction to Computer Technology	186	2872
60002	Computing Systems	9	73
60003	Computer and Information Technology	97	1702
60004	Computer Applications	366	6478
60010	Computer Literacy	83	1457
60201	Web Page Design	1	2
60202	Computer Graphics	29	586
Total		771	13,170

Secondary Category

Secondary Category	Number
Number of Secondary Computer Science Courses	772
Total Enrollment of Secondary Computer Science Courses	8,022
School Systems with Secondary Computer Science Courses	131
Schools with Secondary Computer Science Courses	139
Number of Secondary Computer Science Teachers/Facilitators	198
Secondary Computer Science Course Codes Available	39
Secondary Computer Science Course Codes Used	25

Course Code	Secondary Computer Science Courses	Courses	Enrollment
10001	Introduction to Computer Technology	24	342
10002	Computing Systems	10	44
10003	Computer and Information Technology	44	447
10004	Computer Applications	292	4130
10005	Business Computer Applications	71	859
10006	Telecommunications	0	0

10007	IB Information Technology in a Global Society	1	12
10019	AP Computer Science Principles	2	16
10051	Information Management	4	30
10052	Database Management and Data Warehousing	2	2
10053	Database Applications	2	0
10054	Data Systems/Processing	1	11
10101	Network Technology	0	0
10102	Networking Systems	0	0
10103	Area Network Design and Protocols	0	0
10104	Router Basics	0	0
10105	NetWare Routing	0	0
10106	Wide Area Telecommunications and Networking	0	0
10107	Wireless Networks	0	0
10108	Network Security	4	13
10109	Essentials of Network Operating Systems	0	0
10110	Microsoft Certified Professional (MCP)	5	37
10151	Business Programming	0	0
10152	Computer Programming	134	720
10153	Visual Basic (VB) Programming	2	13
10154	C++ Programming	1	1
10155	Java Programming	12	125
10156	Computer Programming—Other Language	5	66
10157	AP Computer Science A	18	124
10159	IB Computer Science	8	24
10201	Web Page Design	60	382
10202	Computer Graphics	47	443
10251	Computer Technology	16	149
10252	Computer Maintenance	0	0
10253	Information Support and Services	0	0
10254	IT Essentials: PC Hardware and Software	0	0
10255	CISCO—The Panduit Network Infrastructure Essentials (PNIE)	6	24
10995	Information Technology—Aide**	0	0
10998	Information Technology—Workplace Experience	1	8
Total		772	8,022

[Montana course codes](#) are a subset of the NCES (National Center for Education Statistics) Standard Codes. Along with the course code, a content description for each course is provided.

*Highlighted Green are courses that can be taught by Computer Coding endorsed teachers (10S CC)

*Highlighted Blue are courses that can be taught, right now, by Mathematics endorses teachers (02S MAT).

* As of 19-20 New course code: 71009 (PTS)/21009 (Secondary) Robotics, this is an open endorsement course so it can be taught be any grade-level appropriately endorsed teacher

**No longer available for Montana Schools as of 19-20.

DRAFT SUMMARY Updated: February 21,2020

AP Computer Science Course

During the 2018- 2019 school year two AP Computer Science courses were offered in Montana, [AP Computer Science A](#) and [AP Computer Science Principles](#). 140 students from 16 high schools comprised of 15 school districts, including one Catholic school, offered an AP Computer Science course. Of those 16 high schools, 7 schools offered the course through Montana Digital Academy (MTDA).

Costs for offering the MTDA AP Computer Science course for 25 students is \$15,000 (\$7,500 per semester). Historically this course has not been full with only 10 students enrolled during the 2018-2019 school year.

This summer there is one, four day, AP Computer Science professional development training occurring in Montana hosted by School Services of Montana. The cost for this professional development is \$775.

Additional funds would need to be allocated in promotion to students and training for teachers to increase the number of students enrolled in AP Computer Science courses.