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Creating Opportunities for Students to Keep Wyoming Strong

Proposed 2016 Wyoming Science Content & Performance Standards

State Board of Education Meeting in Laramie, WY May 19, 2016

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Overview

- Message from Members of the Committee
- Input from Public Hearings & Online Surveys
- District Needs Survey Results
- Crosswalk and Plans
  - Implementation
  - Professional Development (PD)
  - Communication
- Edits & Supporting Documents

SSRC Response - Video

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- https://www.youtube.com/watch?v=5hXolvWbazY&feature=youtu.be

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PUBLIC INPUT – ONLINE & REGIONAL HEARINGS

Public Input Received Online and at Public Hearings

Total	165
Online	151
Verbal	9
Written	4

Date	Location	# of Verbal Comments	# of Written Comments
W. 5/4/16	Gillette	0	0
Th. 5/5/16	Casper	3	1
F. 5/6/16	Cheyenne	1	0
M. 5/9/16	Green River	0	1
T. 5/10/16	Powell	5	2
	TOTAL	**9**	**4**

PUBLIC INPUT on SCIENCE STANDARDS – Collected Online and at Public Hearings – March 21 – May 10, 2016

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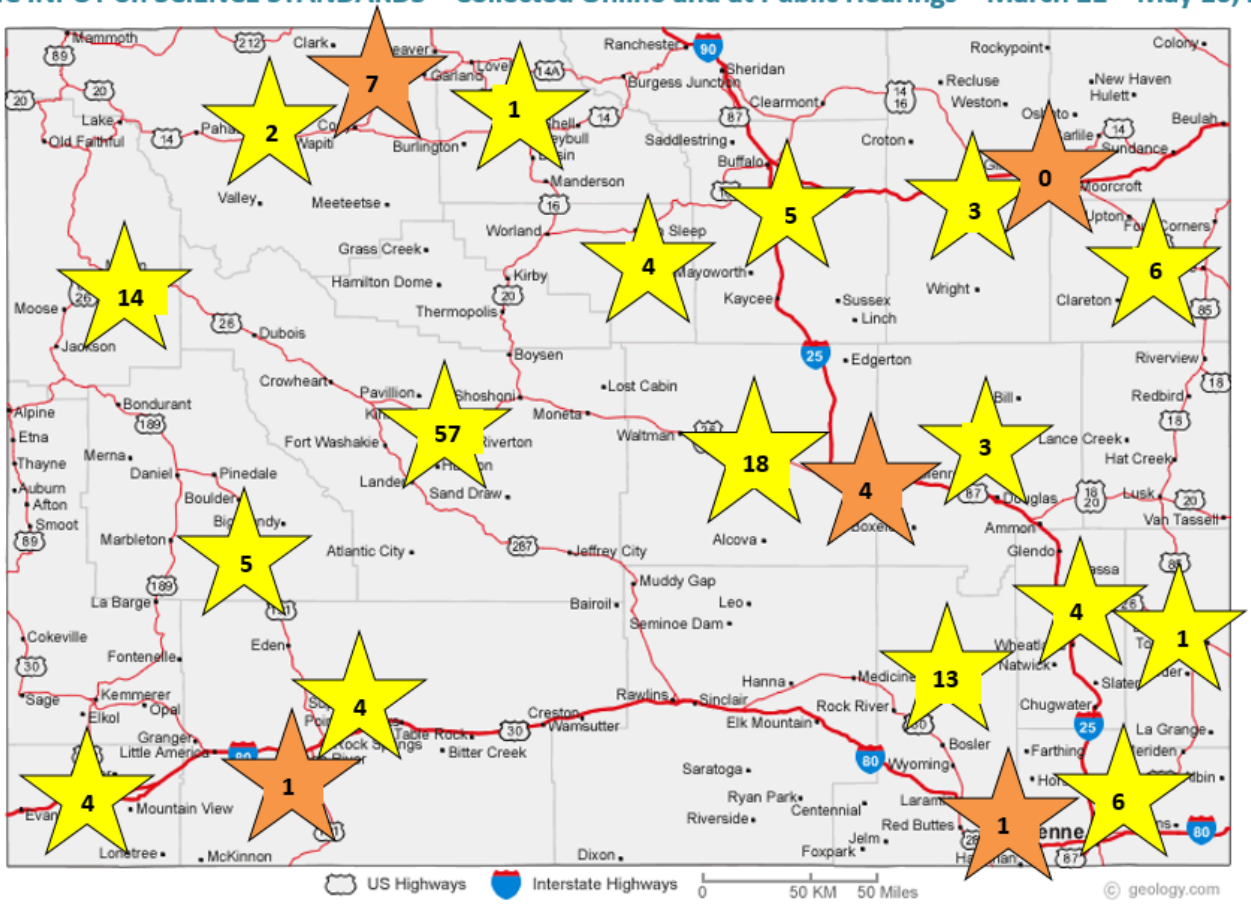

Map of Public Input

Public Input Given Online

151

Input Given at Public Hearings

13

Comments from Public Hearings

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- "I have looked at the original 2013 NGSS, the Wyoming NGSS version. I don't see a tremendous difference between the original NGSS and what is being offered up here tonight. I am against this. I think it is not science education. It is largely a political indoctrination. I am very disappointed."

Comments from Public Hearings

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- "So I think that is a good direction to go with the standards. I also really like the idea of the standards for early grade levels being clearly laid out and I do agree with I feel for the first grade teacher trying to figure out how they are going to do that on top of all the other things. That will not be easy and will require a lot of support a lot more thinking about the reality of the nuts and bolts of how that happens. I don't know how it will look but I think it is good. Some concerns I have. I do agree with the idea of rigor, increasing the science level and becoming more competitive. Looking at the high school standards as a high school teacher, I am concerned about the appropriateness of these standards for the general high school population. I feel like they are designed to prepare a student to be working in a scientific field or studying in a scientific field. They will do a good job with that but I am concerned about holding all Wyoming students accountable for that level of scientific expertise. Another concern that has already been shared is the number of standards. It's daunting to think about trying to accomplish that at a high school level…

Comments from Public Hearings

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- "… My final concern is specifically with some of the language in a couple of the ESS and the one I feel there is some of the anti-human sentiment in some of the standards in the ESS section. An example is ESS 3-4. Certainly, we need to be aware of impacts on natural systems. What I think this standard is missing, what it needs to have, is the idea is that we really are concerned about protecting humans, and human well being and humans flourishing, and I don't think that's conveyed in a couple of the way the standards are worded and this standard in particular. Not that I think it would be valued for a student to think about refining or developing technological solutions that reduce human impact but not with the idea that our most important job is to not have humans impact the environment. That should not be taught as a standard. It should be we need to protect the environment within the bigger concept of what makes human life better."

Raw Summary of Online Public Input
March 21 – May 10, 2016

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Online Public Input Responses	Want SBE to Adopt as is	Think Minor Edits May Be Needed	Think There are Major Concerns	Other
# of Responses	74	42	25	6
Total # of Input	147	147	147	147
% of Responses	50%	29%	17%	4%

We believe this data is skewed a bit as you see on the next slide.

#1 Received Comment

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"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16):

1. K-ESS3-3, Earth and Human Activity (page 18);
2. 4-ESS3-1, Earth and Human Activity (page 82);
3. 5-ESS3-1, Earth and Human Activity (page 100);
4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important.
5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."

Want SBE to Adopt as is	Think Minor Edits May Be Needed	Think Minor Edits May Be Needed	Other	TOTAL
11	7	5	1	24

Online Comments for Support of Adoption

- "I am glad that we finally have a set of standards that emphasizes student performance rather than memorization of facts without application."
- "Science is a critical subject for our students to understand and to make intelligent interpretation of information and decisions. It is time to move beyond the inadequate current (2008) Wyoming standards."
- "I like the way the standards are broken out per grade level and clearly outline what should be taught at each grade level."

Online Comments for Support of Adoption

- “I am in favor of the more specific nature regarding the new standard requirements. The added benefits of assessment boundaries and suggested tie-ins with other scholastic disciplines brings additional support for instructors looking to creating a holistically rounded curriculum.”
- “Excellent work by the committee. The standards are well written to support all students' ability to master standards.” (2 X)

Online Input Concerns

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# of Comments	Concern
9	ESS Perf. Expect. not aligned with DCI's
6	Time needed for implementation
5	HS LS4 - biological evolution
4	The # of benchmarks to be taught (time)
3	Assessment time frame
3	Lack of K-5 resources
3	DOK is too much (Depth of Knowledge)
1	Scientific method removed (misinformed)

Online Comments for Minor Edits

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- "Depth of knowledge has taken a huge jump in all grade levels. Some topics might be broken up between several grade levels to transition the students into higher levels of thinking."
- "What types of resources will be available for teaching? Will they be mandatory or optional? Will resources be stored at the science depot for check out?"
- "What type of assessment will be required, if any? Will teachers be responsible for our own assessments?"

Online Comments for Minor Edits

- "How do you envision these standards to be implemented over time: Engineering, Technology and Applications of Science. Will each grade level be responsible for these standards? Will a clarification statement be included for these standards? These standards seem very broad and somewhat unclear."
- "I appreciate what is trying to be achieved with these standards. I would be more on board with applying these standards as is, IF students were ONLY tested in the third, fifth and eighth grades. "

Online Comments for Major Concerns – Elementary

- "The standards for K to 3 seem difficult for a young mind. How is the standards going to be taught? …. Is curriculum just going to be added to the teacher's plate w/o proper training?"
- "After reviewing the 2016 proposed standards I am concerned with the movement of depth of knowledge required at the elementary levels. The movement of the content knowledge does not seem matched to cognitive development."
- "How do you envision these standard be implemented over time?"

Online Comments for Major Concerns – Secondary

- "I question whether or not these standards are appropriate for all high school students."
- "The timeline needed to meet all standards is not realistic. When only three science credits are required to attain a high school diploma, how are students going to meet the expectations for all standards without additional course work required." (2X)
- "Better than what we had, but NGSS is better!" (5X)

Number of Benchmarks by Grade & Domain

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	Life Science	Earth & Space Science	Physical Science	Engineering & Technology	Total
K	1 Benchmark	5 Benchmarks	4 Benchmarks	3 Benchmarks	13
1	3 Benchmarks	2 Benchmarks	4 Benchmarks	2 Benchmarks	11
2	3 Benchmarks	4 Benchmarks	4 Benchmarks	3 Benchmarks	14
3	8 Benchmarks	3 Benchmarks	4 Benchmarks	3 Benchmarks	18
4	2 Benchmarks	5 Benchmarks	7 Benchmarks	3 Benchmarks	17
5	2 Benchmarks	5 Benchmarks	6 Benchmarks	3 Benchmarks	16
6-8	21 Benchmarks	15 Benchmarks	19 Benchmarks	6 Benchmarks	61
9-12	24 Benchmarks	19 Benchmarks	23 Benchmarks	5 Benchmarks	71

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DISTRICT NEEDS SURVEY – RESULTS FOR IMPLEMENTATION

District Needs Survey

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- What do you see as the largest instructional shifts called for in the new Standards?
- How would the new Standards impact curriculum design and/or curriculum mapping in your district?
- What professional development support would your district need from the WDE to implement these new standards? [the State is forbidden from prescribing textbooks or curriculum]
- Please use this space for any additional comments and/or questions for the Science Standards Committee's consideration.

Largest Instructional Shifts

- Professional development for teachers
- Integration of three dimensions of learning science
- Deeper understanding of content and application of content
- Use of science & engineering practices
- Science classes at the high school level

Impact on Curriculum

	Huge Change	Realign Curriculum	Minimal Change	Unsure	No Comments
# of Responses	16	4	6	3	5
Total # of Input	45	45	45	45	45
% of Responses	36%	9%	13%	7%	11%

Educators were not asked to choose any of the above headings, but were rather given an open text box to give their feedback. The above were gleaned from comments given.

PD Support Needed

- Understanding of how to apply the new standards and content
- Three dimensional learning concepts
- Engineering concepts
- On-line resources
- Structure regarding state assessment
- Money for equipment

Additional Comments / ?s

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- Positive Feedback 75%

  proud and ready to move forward
- Concerns: small schools with small budgets

Results from District Needs Survey April 11 – May 11, 2016

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# Took Survey	% Who Agree Science Standards Address the Content Areas Within Science	% Who Agree Appropriately Challenging, Yet Accessible for Students	% Who Agree Provide Clear Learning Progressions Across Grade Levels	% Who Agree the Three Dimensions of Learning Assist with the Instruction of the Standards
45	95%	81%	*58%	88%

* 35% chose “unsure at this time”

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CROSSWALK & PLANS FOR IMPLEMENTATION

Crosswalk Design

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Science Crosswalk Between 2016 Proposed and 2008 Current Wyoming Content & Performance Standards		
Proposed Content & Performance Standard	Alignment Rating with Comment(s)	Current Wyoming Content & Performance Standard
Life Science	0 = No alignment 1 = Weak alignment 2 = Partial alignment 3 = Strong alignment	**Life Science**
Grade 3 Proposed standards are broken out for grades K-5.		**Grade 3** Grade band of current standards is K-4.
3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	2-Proposed standard requires model development of models	SC4.1.2. Students sequence life cycles of living things, and recognize that plants and animals resemble their parents.
3-LS2-1. Construct an argument that some animals form groups that help members survive.	1-Proposed standard requires argument from evidence	SC4.1.3. Students show connections between living things, their basic needs, and the environments
3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	1-Proposed standard requires analysis and interpretation	SC4.1.2. Students sequence life cycles of living things, and recognize that plants and animals resemble their parents.
3-LS3-2. Use evidence to support the explanation that observable traits can be influenced by the environment.	2-The proposed standard requires evidence	SC4.1.3. Students show connections between living things, their basic needs, and the environments.

Implementation Plan

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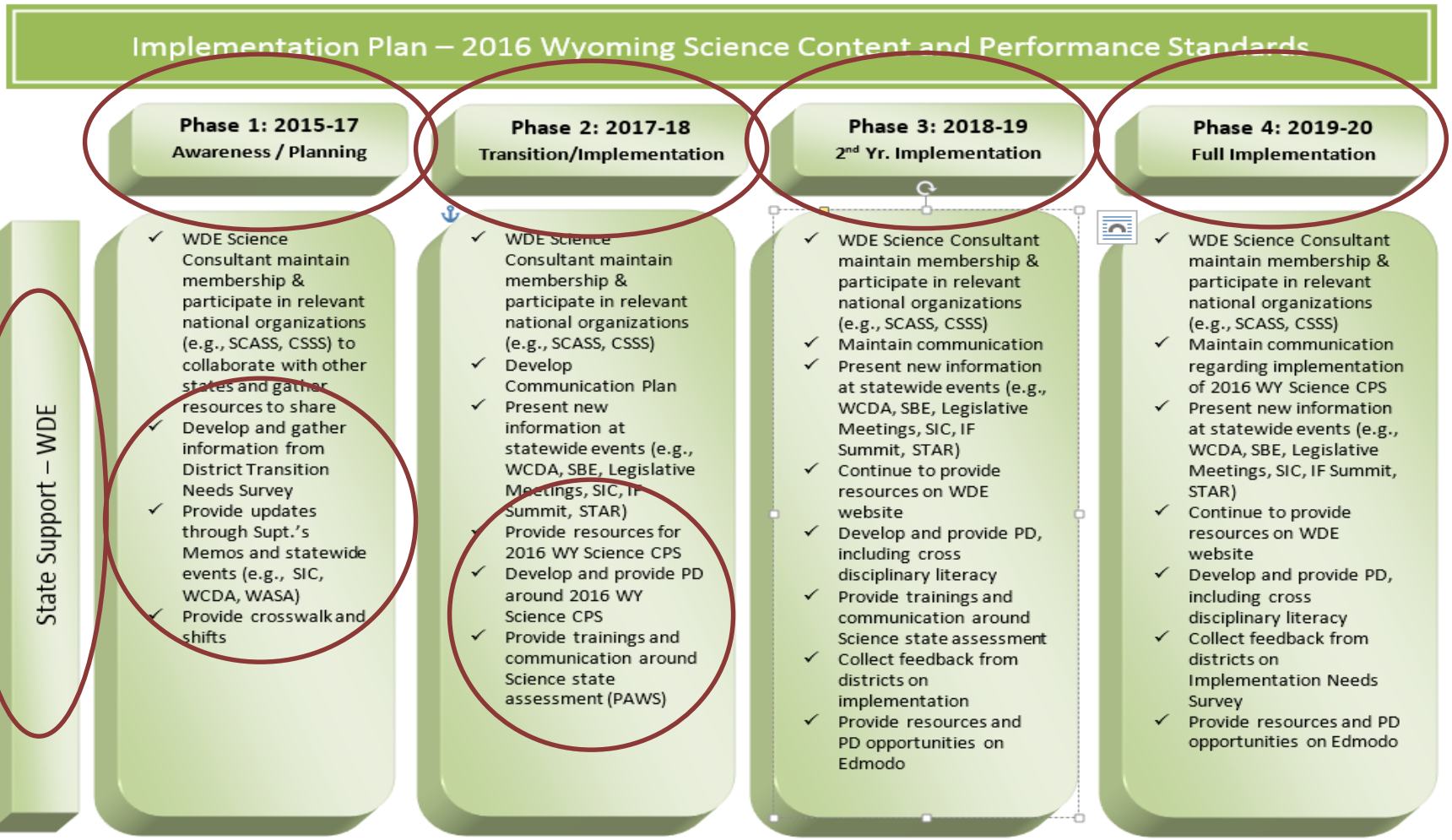

Developed by the WDE Standards Team Science Consultant- Barb Marquer 307-777-5506 barb.marquer@wyo.gov

Implementation Plan

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Implementation Plan – 2016 Wyoming Science Content and Performance Standards

	Phase 1: 2015-17 Awareness / Planning	Phase 2: 2017-18 Transition/Implementation	Phase 3: 2018-19 2nd Yr. Implementation	Phase 4: 2019-20 Full Implementation
Recommended District Support	✓ Review proposed draft standards and give feedback on District Transition Needs Survey ✓ Consider possible impact of 2016 WY Science CPS on curriculum, district assessments, and instruction ✓ Review District Assessment System (DAS) Guidebook	✓ Develop Transition Plan to 2016 WY Science CPS ✓ Develop understanding of Learning Progressions of 2016 WY Science CPS ✓ Review alignment of curricular resources ✓ Review and align district curriculum, instruction, district assessments, and district PD	✓ Develop and implement PD aligned to 2016 WY Science CPS ✓ Maintain and develop further resources, including resources on the WDE website ✓ Identify and select aligned instructional practices ✓ Develop and update district assessments ✓ Parent night to show new methods and reasoning ✓ Provide feedback to WDE on 2016 WY Science CPS	✓ Evaluate implementation of 2016 WY Science CPS ✓ Review curriculum, district assessments, and instructional practices ✓ Review assessment data from classroom, district, benchmark, and summative assessments ✓ Parent night to show new materials/texts ✓ Provide feedback to WDE on 2016 WY Science CPS
State Assessment & Accountability	✓ No change to State TEST ✓ ACT ✓ Accountability measures per WAEA	✓ Field test items on 2016 WY Science CPS ✓ ACT ✓ Accountability measures per WAEA	✓ Operational items and additional field test items on 2016 WY Science CPS ✓ ACT ✓ Accountability measures per WAEA	✓ Fully operational on 2016 WY Science CPS ✓ ACT ✓ Accountability measures per WAEA

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Professional Development Plan

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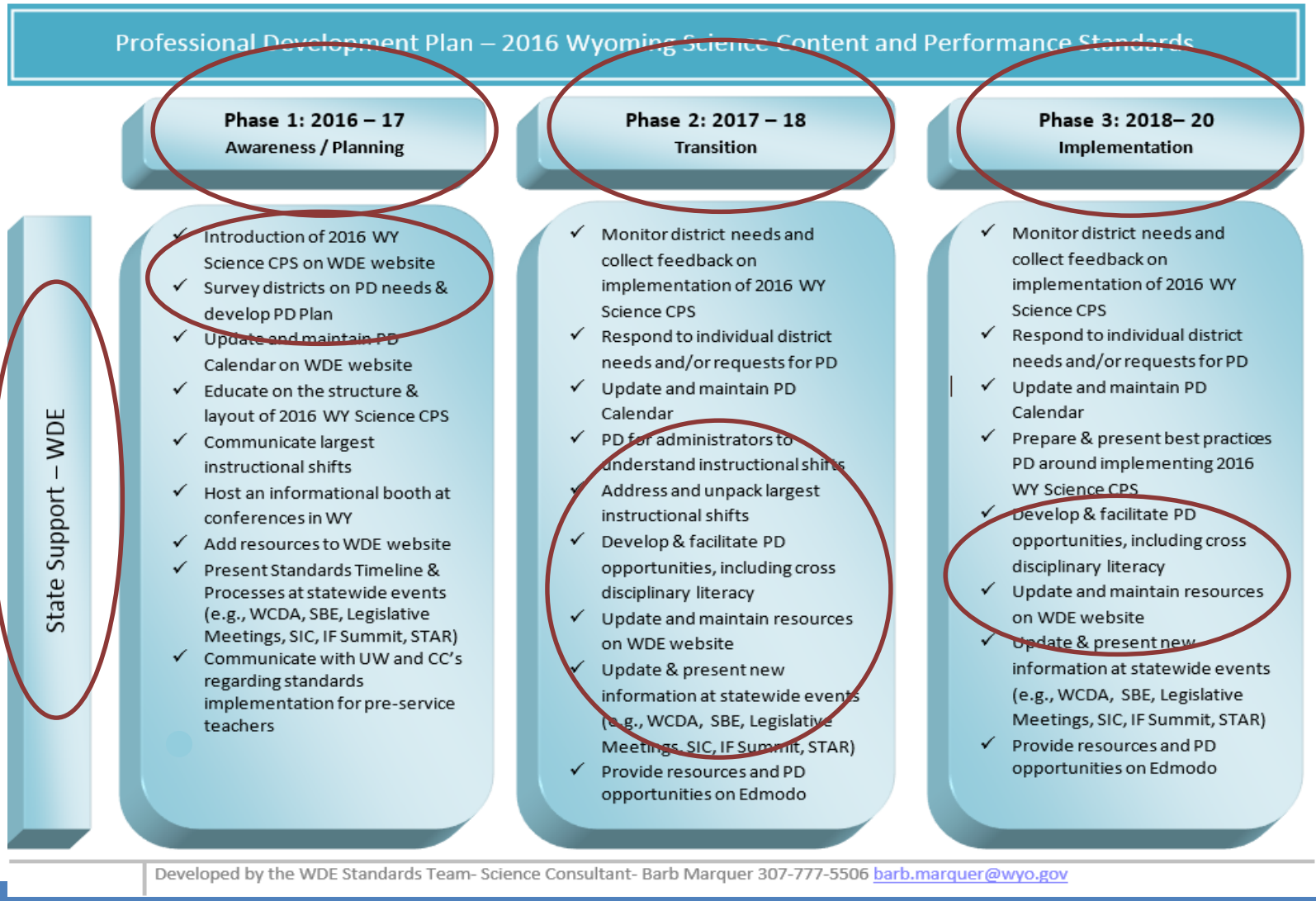

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Communication Plan

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Communication Plan – 2016 Wyoming Science Content and Performance Standards

State Support – WDE

Phase 1: 2015 – 17
Awareness / Planning

Communicate the Following through Various Modes of Communication:

- ✓ Gather contact information of interested people to serve on committee
- ✓ Educator Participation
  - K-12
  - Administrators
  - Higher Ed.
  - Community
  - Parents
  - Business Members
  - Students
- ✓ Information about standards revision process and invite public
- ✓ Survey requesting public feedback on current standards & possible revisions desired
- ✓ Survey results to SBE
- ✓ Resources on the WDE website

Phase 2: 2017 – 18
Transition

Communicate the Following through Various Modes of Communication:

- ✓ Proposed standards on website
- ✓ Survey requesting feedback on proposed standards
- ✓ Survey results to SBE
- ✓ Informational booth at conferences in WY
  - To educate districts on structure and layout of proposed standards
  - To gather feedback
- ✓ Crosswalk showing shifts, changes, and additions to standards
- ✓ Updated Implementation & PD Plans (as needed)
- ✓ PD opportunities and resources

Phase 3: 2018– 20
Implementation

Communicate the Following through Various Modes of Communication:

- ✓ New standards & resources on WDE website
- ✓ Survey requesting feedback on implementation of new standards
- ✓ Parent communication brochure for district use
- ✓ Updated Implementation & PD Plans (as needed)
- ✓ PD opportunities and resources

MODES of COMMUNICATION

- ✓ WDE Website
- ✓ Supt.'s Memo
- ✓ Press Release
- ✓ Brochures / FAQs
- ✓ Social Media
  - Twitter
  - FB
  - Edmodo
- ✓ KWDE Radio Spot
- ✓ Google Hangout
- ✓ WEN
- ✓ WebEx
- ✓ Public Forum

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Standards Revisions

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Log of Edits & Changes

Draft Publisher and Vertical Documents on the Proposed 2016 Wyoming Science Content and Performance Standards

(March 16 – April 27, 2016)

26	Publisher Doc Changes				
27	**Standard**	**Page #**	**Date Changed**	**Changed by**	**Notes**
28	HS PS Storyline	173	3/16/2016	TH	Added "HS-PS4-4 was removed. T
29		5	3/21/2016	BM/LH	Added ISTE Standards, Changed
30	MS Storyline	104	3/21/2016	BM/LH	Added Science & Engineering Pra
31	MS-ETS1-1	166	3/28/2016	TH	Corrected word from Siting to Citin
32	HS-PS1-2	175	4/1/2016	TH	added "and revise, as needed" to
33		7	4/6/2016	TH	Corrected spelling of Teresa
34	K-LS1-1	13	4/15/2016	TH	added ETS-TSTE-3/and Health an
35	K-2-ETS1-1	19	4/15/2016	TH	added science connection to PE a

Edits Made During SBE Review & Public Input Period

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Type of Changes	Publisher Document	Vertical Document
Editorial Edits	6	12
Additions	Pg. 5 - ISTE Standards MS Storyline: SEP: LS, ESS, PS HS-PS4-4 explanation of removal Footer date	ISTE Standards grade sections: 1,2,3 K-LS1-1 5-PS3-1 HS-PS4-4 Footer date
Cross-Curricular Section	1 PE	5 Math
Bucking Horse		HS-ESS2-5
Total	**11**	**23**

Appendices

- Appendix A - Houseal Model
- Appendix B – 3 Dimensional Framework
- Appendix C – ISTE Standards (International Society of Technology in Education)
- Appendix D – Literacy Connections
- Appendix E – Disciplinary Core Ideas
- Appendix F – Science & Engineering Practices
- Appendix G – Crosscutting Concepts
- Appendix H – Nature of Science
- Appendix I – Engineering, Technology, & Applications of Science Connections
- Appendix J - Glossary
- Appendix K - Acronyms

Appendix A

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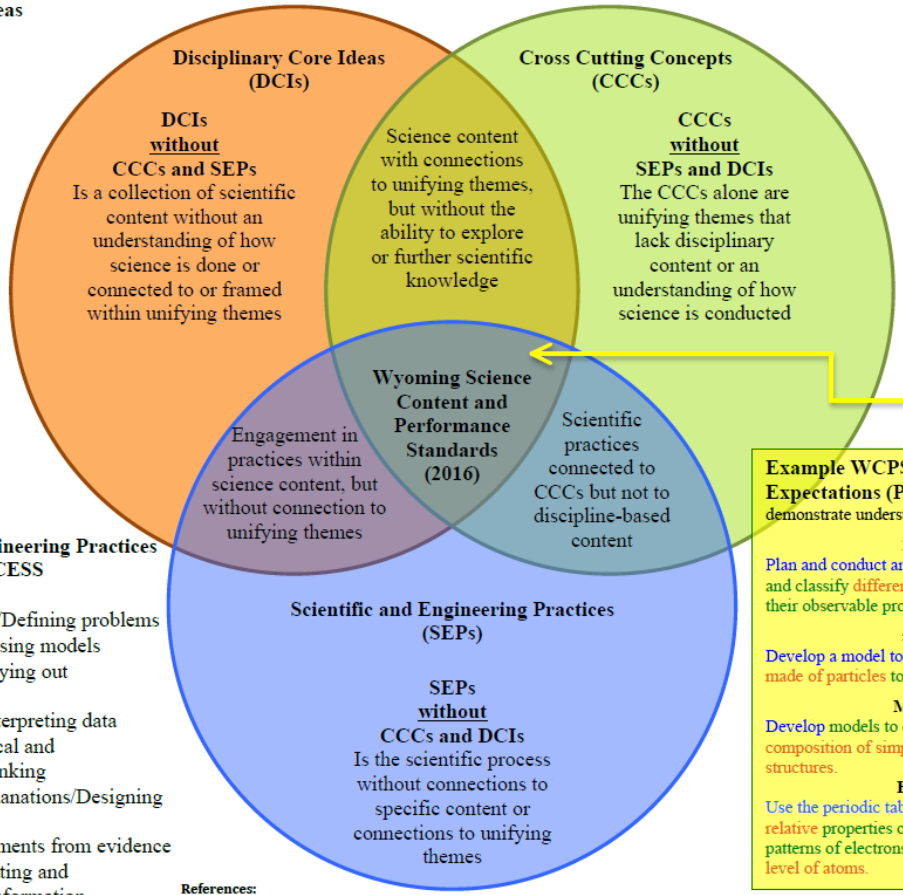
A Model of the Three Dimensions of Science Learning

Adapted from: Houseal, A. (2015). A visual representation of three-dimensional learning: A tool for evaluating curriculum. Science Scope 39 (1): 58-62.

Disciplinary Core Ideas
CONTENT

- Life Sciences
- Physical Sciences
- Earth Systems Sciences
- Engineering, Technology, and Applications of Science



Cross Cutting Concepts
BIG IDEAS

- Patterns
- Cause & effect
- Scale, proportion, and quantity
- Systems & systems models
- Energy & matter
- Structure & function
- Stability & change

THIS IS WHERE WE WANT TO BE!

Scientific and Engineering Practices
PROCESS

- Asking questions/Defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematical and computational thinking
- Constructing explanations/Designing solutions
- Engaging in arguments from evidence
- Obtaining, evaluating and communicating information

Example WCPS Performance Expectations (PEs): Students who demonstrate understanding can:

2-PS1-1.
Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

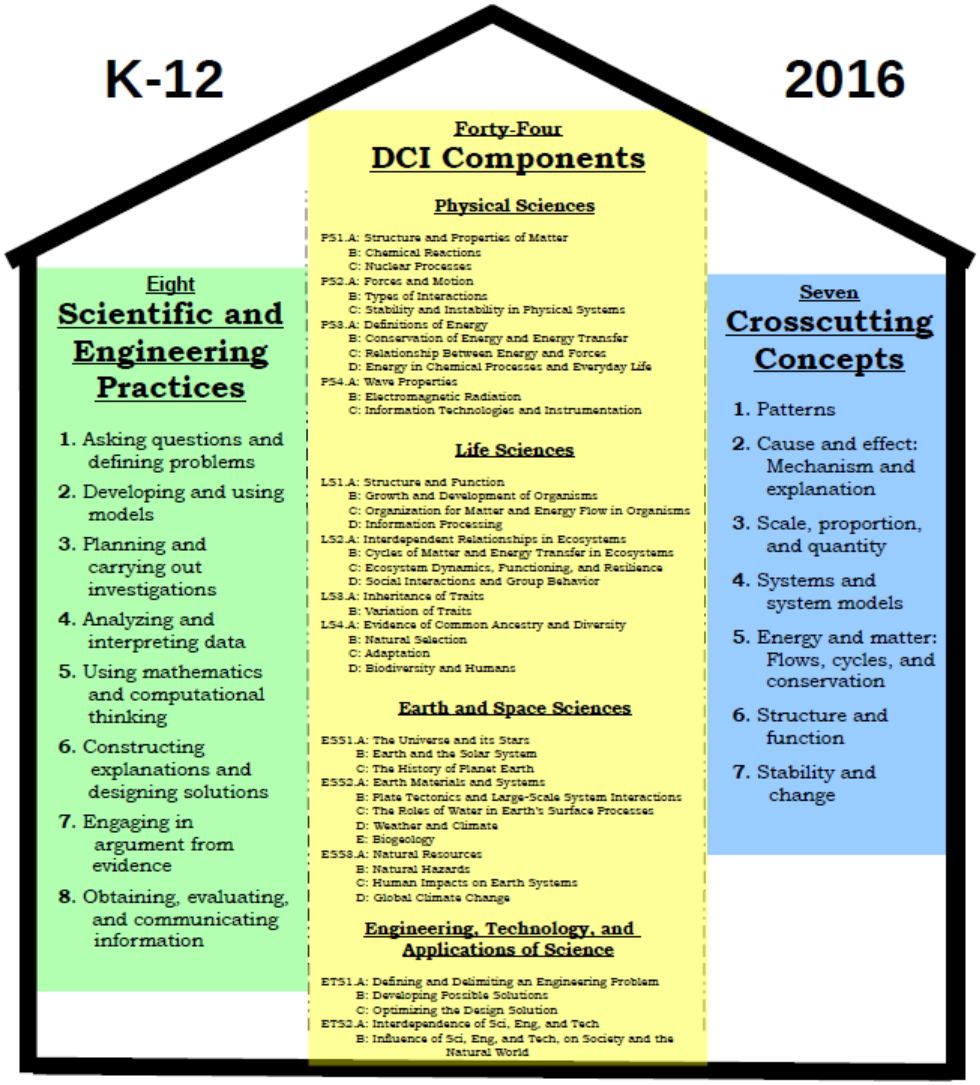
5-PS1-1.
Develop a model to describe that matter is made of particles too small to be seen.

MS-PS1-1.
Develop models to describe the atomic composition of simple molecules and extended structures.

HS-PS1-1
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

References:
National Research Council [NRC]. (2012). *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.*. Washington, DC: The National Academies Press.
NRC. (2013). *Next Generation Science Standards: For States, By States.* Washington, DC: The National Academies Press.

Wyoming Science Content and Performance Standards



Three Dimensions of Learning

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Appendix B

ISTE

National Educational Technology Standards for Students

1. **Creativity and Innovation**
   Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:
   - **A.** Apply existing knowledge to generate new ideas, products, or processes.
   - **B.** Create original works as a means of personal or group expression.
   - **C.** Use models and simulations to explore complex systems and issues.
   - **D.** Identify trends and forecast possibilities.

2. **Communication and Collaboration**
   Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:
   - **A.** Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
   - **B.** Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
   - **C.** Develop cultural understanding and global awareness by engaging with learners of other cultures.
   - **D.** Contribute to project teams to produce original works or solve problems.

3. **Research and Information Fluency**
   Students apply digital tools to gather, evaluate, and use information. Students:
   - **A.** Plan strategies to guide inquiry.
   - **B.** Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
   - **C.** Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.
   - **D.** Process data and report results.

4. **Critical Thinking, Problem Solving, and Decision Making**
   Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:
   - **A.** Identify and define authentic problems and significant questions for investigation.
   - **B.** Plan and manage activities to develop a solution or complete a project.
   - **C.** Collect and analyze data to identify solutions and/or make informed decisions.
   - **D.** Use multiple processes and diverse perspectives to explore alternative solutions.

5. **Digital Citizenship**
   Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:
   - **A.** Advocate and practice safe, legal, and responsible use of information and technology.
   - **B.** Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
   - **C.** Demonstrate personal responsibility for lifelong learning.
   - **D.** Exhibit leadership for digital citizenship.

6. **Technology Operations and Concepts**
   Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:
   - **A.** Understand and use technology systems.
   - **B.** Select and use applications effectively and productively.
   - **C.** Troubleshoot systems and applications.
   - **D.** Transfer current knowledge to learning of new technologies.

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Appendix C

Connections to the Common Core State Standards (CCSS) for Literacy in History, Social Studies, Science, and Technical Subjects: Standards Coding for Language Arts (ELA) & Math

Content Standard	CCSS Coding	Stands for	Where You'll Find It
ELA	R.CCR.9 W.CCR.1	Reading / Writing College- and Career-Ready Anchor Standard **Example:** R.CCR.9 = Reading, Individual College and Career Readiness (CCR) Anchor Standard, Standard 9	Language Arts Standards - CCSS ELA pages, after the introduction (Reading - CCR, K-5 pg. 10; Gr. 6-12 pg. 35) (Writing - CCR, K-5 pg. 18; Gr. 6-12 pg. 41)
Reading	RL.3.2 RI.4.3	Reading of Literature, Gr. 3 Reading for Information, Gr. 4 **Example:** RI.4.3 = Reading, Informational Text, Grade 4, Standard 3	Language Arts Standards - CCSS ELA pages, after the introduction (K-5 pp. 11-12; Gr. 6-12 pp. 36-38) (K-5 pp.13-14; Gr. 6-12 pp. 39-40)
Writing	W.5.1a	Writing, Gr. 5 **Example:** W.5.1a Writing, Grade 5, Standard 1a	Language Arts Standards - CCSS ELA pages, after the introduction (K-5 pp. 19-21; Gr. 6-12 pp. 42-47)
Literacy Standards for History, Science, & Technical Subjects	RHST.CCR.2 RH.9-10.3 RST.11-12.3 WHST.CCR.2 WHST.9-10.3	Reading for History/S.S., Science, & Technical Subjects), CCR Anchor Standard #2 Reading Lit. in History, Gr. 9-10 Reading Lit. in Science & Technical Subjects, Gr. 11-12 **Example:** RST.6-8.3 = Reading, Science and Technical Text, Grade 6-8, Standard 3	Language Arts Standards - CCSS ELA pages, after the introduction (Gr. 6-12) (Reading - CCR pg. 60) (Reading - History pg. 61) (Reading - Science & Technical Subjects (RST) pg. 62) (Writing - CCR pg. 63) (Writing for Literacy in History, Science, & Technical Subjects (WHST) pp. 64-66)
Math	MP.2 7.G.A.2	Math Practice #2 7th Grade Geometry **Example:** 4.MD.A.2 = 4th Grade Math, Measurement & Data Domain, 1st Cluster Heading, Standard 2	Mathematics Standards – CCSS Math pages, after the introduction (K-12 pp. 10-83)

All standards documents can be found on the Wyoming Department of Education Standards Page at http://edu.wyoming.gov/educators/standards/.

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Appendix D

Appendix E

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Wyoming Disciplinary Core Idea Progressions

Physical Science Progression				
	Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
PS1.A Structure of Matter (Includes PS1.C Nuclear Processes)	Matter exists as different substances that have observable different properties. Different properties are suited to different purposes. Objects can be built up from smaller parts.	Because matter exists as particles that are too small to see, matter is always conserved even if it seems to disappear. Measurements of a variety of observable properties can be used to identify particular materials.	The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter, phase changes, and conservation of matter.	The sub-atomic structural model and interactions between electric charges at the atomic scale can be used to explain the structure and interactions of matter, including chemical reactions and nuclear processes. Repeating patterns of the periodic table reflect patterns of outer electrons. A stable molecule has less energy than the same set of atoms separated; one must provide at least this energy to take the molecule apart.
PS1.B Chemical Reactions	Heating and cooling substances cause changes that are sometimes reversible and sometimes not.	Chemical reactions that occur when substances are mixed can be identified by the emergence of substances with different properties; the total mass remains the same.	Reacting substances rearrange to form different molecules, but the number of atoms is conserved. Some reactions release energy and others absorb energy.	Chemical processes are understood in terms of collisions of molecules, rearrangement of atoms, and changes in energy as determined by properties of elements involved.
PS2.A Forces and Motion	Pushes and pulls can have different strengths and directions, and can change the speed or direction of its motion or start or stop it.	The effect of unbalanced forces on an object results in a change of motion. Patterns of motion can be used to predict future motion. Some forces act through contact, some forces act even when the objects are not in contact. The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.	The role of the mass of an object must be qualitatively accounted for in any change of motion due to the application of a force.	Newton's 2nd law (F=ma) and the conservation of momentum can be used to predict changes in the motion of macroscopic objects.
PS2.B Types of Interactions			Forces that act at a distance involve fields that can be mapped by their relative strength and effect on an object.	Forces at a distance are explained by fields that can transfer energy and can be described in terms of the arrangement and properties of the interacting objects and the distance between them. These forces can be used to describe the relationship between electrical and magnetic fields.
PS2.C Stability & Instability in Physical Systems	N/A	N/A	N/A	N/A

Appendix F

WYOMING DEPARTMENT OF EDUCATION

Wyoming Science and Engineering Practices

1. Asking Questions & Defining Problems					
A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works and which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and identify constraints to solve problems about the designed world. Both scientists and engineers also ask questions to clarify ideas.					
Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.	**K-2**	• Ask questions based on observations to find more information about the natural and/or designed world(s).	• Ask and/or identify questions that can be answered by an investigation.	• Define a simple problem that can be solved through the development of a new or improved object or tool.	
Asking questions and defining problems in 3–5 builds on K–2 experiences and progresses to specifying qualitative relationships.	**3-5**	• Ask questions about what would happen if a variable is changed.	• Identify scientific (testable) and non-scientific (non-testable) questions. • Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.	• Use prior knowledge to describe problems that can be solved. • Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.	
Asking questions and defining problems in 6–8 builds on K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models.	**6-8**	Ask questions • that arise from careful observation of phenomena, models, or unexpected results, to clarify and/or seek additional information. • to identify and/or clarify evidence and/or the premise(s) of an argument. • to determine relationships between independent and dependent variables and relationships in models.. • to clarify and/or refine a model, an explanation, or an engineering problem.	• Ask questions that require sufficient and appropriate empirical evidence to answer. • Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles.	• Ask questions that challenge the premise(s) of an argument or the interpretation of a data set.	• Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.
Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.	**9-12**	Ask questions • that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information. • that arise from examining models or a theory, to clarify and/or seek additional information and relationships. • to determine relationships, including quantitative relationships, between independent and dependent variables. • to clarify and refine a model, an explanation, or an engineering problem.	• Evaluate a question to determine if it is testable and relevant. • Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.	• Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.	• Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical and/or environmental considerations.

Appendix G

WYOMING DEPARTMENT OF EDUCATION

Wyoming Crosscutting Concepts

		Grades K-2	Grades 3-5	Grades 6-8	Grades 9-12
1	Patterns	K-LS1-1, K-ESS2-1, 1-LS1-2, 1-LS3-1, 1-ESS1-1, 1-ESS1-2, 2-PS1-1, 2-ESS2-2, 2-ESS2-3	3-PS2-2, 3-LS1-1, 3-LS3-1, 3-ESS2-1, 3-ESS2-2, 4-PS4-1, 4-PS4-3, 4-ESS1-1, 4-ESS2-2, 5-ESS1-2	MS-PS1-2, MS-PS1-5,MS-PS4-1, MS-LS2-2, MS-LS4-1, MS-LS4-2, MS-LS4-3, MS-ESS1-1, MS-ESS2-3, MS-ESS3-2	HS-PS1-1, HS-PS1-2, HS-PS1-3, HS-PS1-5, HS-PS2-4, HS-LS4-1, HS-LS4-3, HS-ESS1-5
2	Cause and Effect	K-PS2-1, K-PS2-2, K-PS3-1, K-PS3-2, K-ESS3-2, K-ESS3-3, 1-PS4-1, 1-PS4-2, 1-PS4-3, 2-PS1-1, 2-PS1-2, 2-qPS1-4 2-LS2-1	3-PS2-1, 3-PS2-3, 3-LS2-1, 3-LS3-2, 3-LS4-2, 3-LS4-3, 3-ESS3-1, 4-PS4-2, 4-ESS2-1, 4-ESS3-1, 4-ESS3-2, 5-PS1-4, 5-PS2-1	MS-PS1-4, MS-PS2-3, MS-PS2-5, MS-LS1-4, MS-LS1-5, MS-LS1-8, MS-LS2-1, MS-LS3-2, MS-LS4-4, MS-LS4-5, MS-LS4-6, MS-ESS2-5, MS-ESS3-1, MS-ESS3-3, MS-ESS3-4	HS-PS2-1, HS-PS2-3,HS-PS2-4, HS-PS2-5, HS-PS3-5, HS-PS4-1, HS-PS4-5, HS-LS2-8, HS-LS3-1, HS-LS3-2, HS-LS4-2, HS-LS4-4, HS-LS4-5, HS-LS4-6, HS-ESS2-4, HS-ESS3-5 HS-ESS3-1 HS-ETS1-5
3	Scale, Proportion, and Quantity		3-LS4-1, 5-PS1-1, 5-PS1-2, 5-PS1-3, 5-ESS1-1, 5-ESS2-2	MS-PS1-1, MS-PS3-1, MS-PS3-4, MS-LS1-1, MS-ESS1-3, MS-ESS1-4, MS-ESS2-2	HS-LS2-1, HS-LS2-2, HS-LS3-3, HS-ESS1-1, HS-ESS1-2, HS-ESS1-4
4	Systems and System Models	K-ESS3-1, K-ESS2-2	3-LS4-4, 4-LS1-1, 4-LS1-2, 5-LS2-1 5-ESS2-1, 5-ESS3-1	MS-PS2-1, MS-PS2-4, MS-PS3-2, MS-LS1-3, MS-ESS1-2, MS-ESS2-6	HS-PS2-2, HS-PS3-1, HS-PS3-4, HS-PS4-3, HS-LS1-2, HS-LS1-4, HS-LS2-5, HS-ESS3-6, HS-ETS1-2, HS-ETS1-4
5	Energy and Matter	2-PS1-3	4-PS3-1, 4-PS3-2, 4-PS3-3, 4-PS3-4, 5-PS3-1, 5-LS1-1	MS-PS3-3, MS-PS3-5, MS-LS1-6, MS-LS1-7, MS-LS2-3, MS-ESS2-4	HS-PS1-4, HS-PS1-7, HS-PS1-8, HS-PS3-2, HS-PS3-3, HS-LS1-5, HS-LS1-6, HS-LS1-7, HS-LS2-3, HS-LS2-4, HS-ESS1-2, HS-ESS1-3, HS-ESS2-3, HS-ESS2-6
6	Structure and Function	1-LS1-1, 2-LS2-2, K-2-ETS1-2		MS-PS4-2, MS-PS4-3, MS-LS1-2, MS-LS1-6, MS-LS1-7, MS-LS3-1	HS-PS2-6, HS-LS1-1, HS-ESS2-5
7	Stability and Change	1-PS4-4, 2-ESS1-1, 2-ESS2-1, 3-PS2-4, 3-5- ETS1-1, 3-5- ETS1-2		MS-PS1-6, MS-PS2-2, MS-LS2-4, MS-LS2-5, MS-ESS2-1, MS-ESS3-5 MS-ETS1-1, MS-ETS 1-2	HS-PS1-6, HS-PS4-2, HS-LS1-3, HS-LS2-6, HS-LS2-7, HS-ESS1-6, HS-ESS2-1, HS-ESS2-2, HS-ESS2-7, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS-ETS1-1, HS-ETS1-3

Appendix H

Understandings about the Nature of Science

Understandings about the Nature of Science Associated with the Scientific & Engineering Practices				
Categories	**Scientific Investigations Use a Variety of Methods**	**Scientific Knowledge is Based on Empirical Evidence**	**Scientific Knowledge is Open to Revision in Light of New Evidence**	**Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena**
K-2	• Science investigations begin with a question. • Scientist use different ways to study the world.	• Scientists look for patterns and order when making observations about the world.	• Science knowledge can change when new information is found.	• Scientists use drawings, sketches, and models as a way to communicate ideas. • Scientists search for cause and effect relationships to explain natural events.
3-5	• Science methods are determined by questions. • Science investigations use a variety of methods, tools, and techniques.	• Science findings are based on recognizing patterns. • Scientists use tools and technologies to make accurate measurements and observations.	• Science explanations can change based on new evidence.	• Science theories are based on a body of evidence and many tests. • Science explanations describe the mechanisms for natural events.
MS	• Science investigations use a variety of methods and tools to make measurements and observations. • Science investigations are guided by a set of values to ensure accuracy of measurements, observations, and objectivity of findings. • Science depends on evaluating proposed explanations. • Scientific values function as criteria in distinguishing between science and non-science.	• Science knowledge is based upon logical and conceptual connections between evidence and explanations. • Science disciplines share common rules of obtaining and evaluating empirical evidence.	• Scientific explanations are subject to revision and improvement in light of new evidence. • The certainty and durability of science findings varies. • Science findings are frequently revised and/or reinterpreted based on new evidence.	• Theories are explanations for observable phenomena. • Science theories are based on a body of evidence developed over time. • Laws are regularities or mathematical descriptions of natural phenomena. • A hypothesis is used by scientists as an idea that may contribute important new knowledge for the evaluation of a scientific theory. • The term "theory" as used in science is very different from the common use outside of science.

Performance Expectations That Incorporate Engineering Practices

	Engineering	Physical Science	Life Science	Earth and Space Science
K	K-2-ETS1-1	K-PS2-2 K-PS3-2		K-ESS3-2
	K-2-ETS1-2	K-PS3-2		K-ESS3-3
1	K-2-ETS1-1 K-2-ETS1-2	1-PS4-4	1-LS1-1	
2	K-2-ETS1-1	2-PS1-3		
	K-2-ETS1-2		2-LS2-2	
	K-2-ETS1-3	2-PS1-2		2-ESS2-1
3	3-5-ETS1-1 3-5-ETS1-2	3-PS2-4	3-LS4-4	3-ESS3-1
4	3-5-ETS1-1	4-PS3-4		
	3-5-ETS1-2	4-PS3-4 4-PS4-3		4-ESS3-2
	3-5-ETS1-3	4-PS3-4		
5	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-PS2-1		5-ESS2-1 5-ESS3-1
6-8	MS-ETS1-1	MS-PS1-6 MS-PS2-1 MS-PS3-3		MS-ESS3-3
	MS-ETS1-2		MS-LS2-5	MS-ESS3-3 MS-ESS3-5
	MS-ETS1-3			MS-ESS3-3
	MS-ETS1-4	MS-PS1-6 MS-PS2-1		
	MS-ETS2-1	MS-PS1-3	MS-LS4-5	MS-ESS1-3
	MS-ETS2-2		MS-LS2-5 MS-LS4-5	MS-ESS3-3
9-12	HS-ETS1-1	HS-PS2-6 HS-PS4-2 HS-PS4-5	HS-LS2-7 HS-LS4-6	HS-ESS3-1 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
	HS-ETS1-2	HS-PS2-3 HS-PS3-3 HS-PS4-1	HS-LS2-7 HS-LS4-6	HS-ESS3-3
	HS-ETS1-3	HS-PS2-3 HS-PS4-2 HS-PS4-5		HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
	HS-ETS1-4	HS-PS2-3 HS-PS2-6 HS-PS3-1 HS-PS3-3 HS-PS4-1	HS-LS2-1 HS-LS2-2 HS-LS2-7 HS-LS4-6	HS-ESS3-3 HS-ESS3-4 HS-ESS2-4 HS-ESS2-6
	HS-ETS-1-5	HS-PS2-6 HS-PS4-1 HS-PS4-2	HS-LS2-6 HS-LS3-2 HS-LS4-5	HS-ESS2-2 HS-ESS2-4 HS-ESS2-7 HS-ESS3-1 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4

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Appendix I

Wyoming Science Standards Glossary

Abiotic:
1. not associated with or derived from living organisms
2. a term that refers to nonliving factors in the environment such as light and temperature

Absorption:
1. Biology: uptake of substances by a tissue
2. Chemistry: taking in or reception by molecular or chemical action, as of gases or liquids
3. Physics: removal of energy or particles from a beam by the medium through which the beam propagates

Acceleration: rate of change of the velocity of a moving body; an increase in the magnitude of the velocity of a moving body (an increase in speed) is called a positive acceleration; a decrease in speed is called a negative acceleration

Adaptation: process in which a species becomes better suited to survive in an environment

Aerobic: requiring the presence of air or free oxygen for life

Age: a subdivision of geologic time that divides an epoch into smaller parts

Allele: any of several forms of a gene, usually arising through mutation that are responsible for hereditary variation

Amino Acid: building blocks from which proteins are constructed

Amplitude: a measure of change in signal/wave height over a single period (such as time or spatial period)

Anaerobic: living in the absence of air or free oxygen

Application of Science: any use of scientific knowledge for a specific purpose, whether to do more science; to design a product, process or medical treatment; to develop a new technology; or to predict the impacts of human actions

Analyze: to separate (a material or abstract entity) into constituent parts or elements; determine the elements or essential features of (opposed to synthesize)

Anatomy: science dealing with the structure of animals and plants

Animal: living thig that can move independently and uses senses to reach the environment around it

Anthropogenic: relating to, or resulting from the influence of human beings on nature

Asteroid: small rocky body orbiting the sun

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Appendix J

Wyoming Science Standards Acronyms

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A-CED: Algebra- Creating Equations (Math Connection)

A-SSE: Algebra- Seeing Structure and Expressions (Math Connection)

CCSS: Common Core State Standards

CC: Counting and Cardinality (Math Connection)

CV: Career Vocational

CCC: Crosscutting Concepts

DCI: Disciplinary Core Ideas

ELL: English Language Learner

EE: Expressions & Equations (Math Connection)

ELA: English Language Arts

ED: Engineering Design

ESS: Earth and Space Science

ETS: Engineering, Technology, and Applications of Science

F-BF: Functions-Building Functions (Math Connection)

F-IF: Functions-Interpreting Functions (Math Connection)

FPA: Fine and Performing Arts

G: Geometry (Math Connection)

Appendix K

WYOMING
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Creating Opportunities for Students to Keep Wyoming Strong

QUESTIONS

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Creating Opportunities for Students to Keep Wyoming Strong

WHAT IS NEXT IN THE PROCESS?

CHAPTER 10 RULES

Options Following Public Input

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- Proceed with recommending adoption
  - Opens promulgation process which includes a 2nd public comment period
- Direct the WDE to make minor edits that are not content-related before proceeding with recommending adoption
- Reconvene the SSRC to address concerns and bring back revised standards to the SBE

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Creating Opportunities for Students to Keep Wyoming Strong

Questions

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151	**# of Online Comments from March 21 - May 10, 2016**
1	**# of Letters Received from March 21 - May 10, 2016**

DATE	LOCATION	# in Attendance	# of Verbal Comments	# of Written Comments	Legislators in Attendance	SBE Members in Attendance	
W. 5/4/16	Gillette	3	0	0		Ken Rathbun	
Th. 5/5/16	Casper	4	3	1		Walt Wilcox	note: written comment given following another's verbal comment; 3 public commenters also did online survey
F. 5/6/16	Cheyenne	7	1	0			note: 1 public commenter also did online survey
M. 5/9/16	Green River	8	0	1			
T. 5/10/16	Powell	13	5	2	David Northop		note: 2 public commenters also did online survey

TOTAL Comments 165	**151**	**1**	**9**	**4**
	Online	**Letters**	**Verbal**	**Written**

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
3/22/2016 19:01:06	Green River	**Recomm. as is**	As is
3/23/2016 8:25:07	Upton	**Sugg. minors edits**	After reviewing the 2016 proposed standards I am concerned with the movement of depth of knowledge required at the elementary levels. The movement of the content knowledge does not seem matched to cognitive development.
3/23/2016 9:27:39	Rock Springs	**Recomm. as is**	I am excited about the proposed Science Standards and the alignment that this provides all Wyoming students with other states. The expectations are high and that is a good thing!
3/23/2016 13:17:15	Jackson	**Sugg. minors edits**	Overall, these are a really great set of standards. I like the connections to other content area standards. I wonder why any changes were made from the NTSS standards (climate change and evolution?). It is very helpful for our small state to be able to use the capacity of other larger states when adopting new standards. Making changes to the national standards impedes this work.
3/23/2016 13:31:47	Upton	**Sugg. minors edits**	Depth of knowledge has taken a huge jump in all grade levels. Some topics might be broken up between several grade levels to transition the students into higher levels of thinking. (example: PSE :Energy for Kindergarten and 4th grade)
3/24/2016 18:29:39	Jackson	**Recomm. as is**	Better than what we had, but NGSS is better!
3/24/2016 19:14:11	Newcastle	**Recomm. as is**	The committee worked hard on making these Wyoming Standards - good job group!
3/25/2016 11:52:08	Douglas	**Recomm. as is**	I feel there is a substantial increase in physics standards and there needs to be an adjustment to certification of science teachers to allow a broad field of science the ability to teach these standards. These standards in conjunction with ptsb put districts at a distinct disadvantage when highering new teachers.
3/25/2016 19:34:10	Cheyenne	**Recomm. as is**	They are great standards & reflect a global perspective.
3/25/2016 20:34:18	Laramie	**Sugg. minors edits**	"HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors" describe the process of natural selection, which is one process of evolution but it is not agreed upon that all evolution primarily results from this. Instead the statement would be correct if it referred to: "... the process of evolution by natural selection results from four factors"
3/28/2016 9:00:56	Evanston	**Have major concerns**	The standards for K to 3 seem difficult for a young mind. How is the standards going to be taught? In addition, are these proposed standards being taught by someone qualified? In other words by someone who has been trained through their undergraduate program? Or is the curriculum just going to be added to the teacher's plate w/o proper training?
3/28/2016 9:04:24	Evanston, WY	**Recomm. as is**	As a science teacher, I support the adoption of the NGSS as is. If WY, elects to modify these standards, then they are not standards. Standards are "what students should know and be able to do at each level. The Standards can be used as a reference point for planning teaching and learning programs, and for assessing student progress" locally and nationally. We cannot compare our student data with other states, if we elect to take out performance expectations because our state is highly funded by fossil fuels.
3/28/2016 9:28:33	Evanston	**Have major concerns**	It looks like everything regarding Climate Science has been removed. We may not like it, and oil and coal interests may not like it, but it doesn't neutralize the threat when we cover our eyes.
3/28/2016 16:48:13	Laramie	**Recomm. as is**	Very clear and teacher friendly.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
3/29/2016 11:53:43	Casper	**Sugg. minors edits**	First, I commend this group for it's overall treatment of climate change and evolution in the standards--the two areas over which there was manufactured controversy in the NGSS that led to this effort. I especially commend the group for its treatment of evolution under MS-LS4-2 and HS-LS4-1 for evolution, of deep time in MS-ESS1-4, and climate change under MS-ESS3-5 and HS-ESS3-6. I do think in MS-LS-4-3 we need to restore embryological evidence for evolutionary relationships. While Haeckel's theory of recapitulation is no longer valid, embryology continues to be a critical source of evidence for evolutionary relationships. I also think that the Wyoming Science Standards struck any reference to the age of the earth at 4.6 billion years old was a mistake. My own son has had a science teacher who, because of their activist Christian Creationist viewpoint, refused to teach evolution altogether. If it wasn't for my teaching him at home, my son would have never been exposed to biological evolution in his K-12 educational career in NCSD #1 and I did register complaints with administrators and know first hand this teacher is still refusing to teach evolution and thus either never faced a plan of assistance or employee improvement plan or ignored any coaching that resulted from my parent complaints. Truly, that's an administrative and evaluation issue, but given the age of Neo-McCarthyism in which we live, administrators tend to practically shy away from ensuring these standards are taught in science--even when there is a parent complaint--because of the political danger in so doing. In our community, said principal would be subject to excoriation in the community and even organized attempts to get said principal fired. Teachers can and are targeted for challenges strategically by evangelicals in our community, and it's for that reason we need these standards to be incredibly explicit and clear so that teachers who actually teach science rather than refusing to teach it can fall back on the standards when challenged by parents and community members who've targeted the so-called evolutionist. Therefore, we must restore every reference to the age of the earth at 4.6 billion years and modify all middle and high school standards relating to biological evolution to express the need for every student to understand radiometric dating, the rule of original supposition, and stratigraphy. We need to be really clear because there will be teachers in our state who are challenged by parents and church groups who truly believe the planet is 7,000 years old or younger (so called young earth creationists) so must restore every reference to the 4.6 BYA age of the earth and go a step further in insisting students actually understand all of the different methods of radiometric dating as the core of the evidence for evolution is fossil evidence. Next, I feel HS-ESS3-6 focuses on greenhouse gasses as the exclusive basis of climate models which are incredibly sophisticated and complex in tracking dozens of variables (but doesn't include mention of the need to understand natural forcings as positive feedback loops). I think there needs to be some mention in this standard of the loss of polar ice and albedity (the so called albedo polar ice cap trigger; as ice caps melt, more solar radiation absorbed, causing more ice to melt) in climate models as well as the "methane trigger" or "methane feedback loop" whereby as the planet warms, more deep sea ocean frozen methane melts and more permafrost melts, producing more methane. Based upon our study of Lake El'gygytgyn, with a 3.6 mya continguous multiple sedimentary isotopic record, adjustments to models now predict what the more alarmist models predicted a decade and a half ago--land surface temperatures of 200 F by 2100, which means this is truly an extinction event. The methane trigger, triggered by anthropogenic greenhouse gasses, could threaten to end most life on planet earth, so it's integral to explicitly reference it here in climate models as two natural positive feedback loops triggered by human caused warming so students understand the complexity and sophistication of these models. Further, there should be some mention in this standard of the two polar extremes that these models predict: either a big freeze (so called abrupt climate change) like the Younger Dryas Stadial at the end of the Pleistocene that contributed majorly to the megafauna extinction (due to the disruption of thermohaline circulation when Lake Agassiz dumped into the North Atlantic, causing it to start snowing and not stop for a hundred years until continental glaciers had advanced to New Mexico), or the extreme temperatures aforementioned due to the methane trigger--both of which would make human civilization extinct. Lastly, I'm afraid HS-ESS2-4 which sets up solar radiation as the foundation of the earth's climate, might become a basis for for climate deniers to emphasize solar radiation as an alternate theory for human-caused climate change. It's the most frequently cited canard I've run into in my interactions with those who are not convinced humans are at least contributing if not the major factor. I think there must be some qualifying statement somewhere in this standard that reflects the scientific consensus that solar inputs have been decreasing (Meehl et al. 2004; Stone et al. 2007; Lean and Rind 2008; and Huber and Knutti 2011) in the 20th Century and cannot explain the observed warming very clearly.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
3/30/2016 8:37:54	Lovell	**Have major concerns**	I question whether or not these standards are appropriate for all high school students. The breadth and the depth of them is daunting. There may be some standards that are of less value in a general education. They seem to be more appropriate for students entering scientific fields in college or career after high school. As a high school physical sciences educator I feel like there are too many standards here with too much depth of knowledge to be viable expectations for the general science education of all Wyoming students. I also have some serious concerns about a high school earth science standard. HS-ESS3-4 - This standard should be revised in such a way that it does not take as given the idea that human impacts on natural systems are wrong or negative. It should be clarified that impacts on natural systems are negative inasmuch as they fail to promote human wellbeing but are not inherently negative.
3/30/2016 13:44:46	powell	**Recomm. as is**	this is a lot to cover, hope teachers have time and resources provided by their district to get it done.
4/1/2016 11:08:57	Casper	**Recomm. as is**	These standards provide a rich K-12 science education that focuses on processes, interdisciplinary concepts, global thinking, and a deeper understanding of how and why science matters. This approach to science education allows students the opportunity to explore and experience science through their interests and allows educators the opportunity to truly differentiate to meet the diverse needs of our students. As a science educator, parent, and principal I appreciate the honest treatment of evolution and global climate change. Wyoming needs citizens who are articulate in these very important scientific topics that are often politicized. Thank you to the team members who spent the time and energy to produce this quality document that will positively affect Wyoming students.
4/1/2016 13:11:55	Torrington	**Recomm. as is**	The content of the standards proposed seems fine. The language and/or word choice sometimes makes it confusing for the reader. These are items we are required to present to our students and parents. Having the same information written at a level that is more conducive to our clients (kid-friendly if you will) would be helpful. I have no problem explaining to those parents that I can contact directly. However, there are many parents who I never get to see, and they're understanding of the standards is limited at best.
4/2/2016 13:39:28	Larmamie	**Recomm. as is**	I would like these to be adopted as shown.
4/2/2016 17:44:49			
4/3/2016 16:51:50	Midwest	**Recomm. as is**	I think the standards represent what we, as educators, want our students to know and understand.
4/4/2016 7:57:12	Cody	**Recomm. as is**	We will need resources to teach these standards. I suggest the district provide a set of approved resources immediately, so that teacher direction can be given before the actual resources are adopted. It is such a sensitive subject, and in the past teachers have been left to scramble for materials and resources until a district resource is adopted. If there is direction up front, there is less chance for questionable material to surface, and teachers are protected from attack by the community for their choice of materials/resources used.
4/7/2016 5:12:19	Jackson	**Recomm. as is**	Excellent work by the committee. The standards are well written to support all students' ability to master standards
4/8/2016 15:13:28	Casper, Wyoming	**Recomm. as is**	I am glad that we finally have a set of standards that emphasizes student performance rather than memorization of facts without application.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/10/2016 20:35:30	Worland	**Recomm. as is**	I am in favor of the more specific nature regarding the new standard requirements. The added benefits of assessment boundaries and suggested tie-ins with other scholastic dispilines brings additional support for instructors looking to creating a holistically rounded curriculum.
4/11/2016 7:44:06	Bar Nunn	**Recomm. as is**	Though the time needed to meet all standards is not realistic at the current rate that the science classes are taught in our high school I feel that over time the course set up could be changed and the standards for our students raised. I would say that without four years of science in high school and science being taught in elementary schools it will be challenging to meet these standards. Teachers will need to be highly qualified to teach their subjects, which I believe is important in all fields and especially science.
4/11/2016 7:46:32	Casper	**Have major concerns**	1.) The time needed to meet all standards is not realistic due to the current structure of a traditional Wyoming High School. In order to meet all of the standards listed students would need to take the equivalent of 2 yrs of Earth/Space, 2 yrs Physical Sci/Physics, 2 yrs of Chemistry, and 2 yrs of Biology. There is NO way students can be expected to meet these standards in the current time frame. While most of the standards are addressing the need of more rigor, the timeline to get there is not feasible. We went through the Chemistry portions of the standards and most of those standards are not meet until Chemistry II, and/or Chemistry AP. I like the fact we have new standards coming our way, but am concerned about how to get students to meet all of them in the current system.
4/11/2016 7:49:04	Casper	**Have major concerns**	- The timeline needed to meet all standards is not realistic. When only three science credits are required to attain a high school diploma, how are students going to meet the expectations for all standards without additional course work required. I think with these standards we will need to change our graduation requirements so the students will also have the opportunity to be exposed to all of the standards in a 4 year program. - Additionally, with one Chemistry course, we do not get to equilibrium, kinetics and upper level thermochemistry due to the time constraint. Students in Chemistry 2 or AP Chemistry and IB chemistry have the time to meet the science standards but students that do not take those classes do not currently get exposed to these topics. The time is limited in the first year of chemistry to develop the sense of stoichiometry.
4/11/2016 7:51:32	Evansville	**Have major concerns**	concerns: the time needed to meet all standards is not realistic due to how the "highly qualified" status of teachers currently sits. The expectation that "ALL students will be able to attain all standards during their high school career" is just not realistic either because of the choices of science classes offered (Physical and Life sciences during their 9th and 10th grade years are the only classes that are "mandatory"- then they have the option to branch out into Chemistry, Astronomy, Physics, Anatomy, Bio Tech...etc...). Due to the rigor expected and outlined in the standards as they read now, it's not realistic to expect ALL students to master each one if they only need 3 science classes to graduate.
4/13/2016 8:25:07	Buffalo, WY	**Recomm. as is**	Thank you for taking a stance on the State Science Standards. There is a myopic viewpoint of worry about the wording of climate change and Evolution in the NGSS and how our Wyoming economy can be affected. Knowledge of all aspects of what is currently shown with empirical evidence of commonly criticized and polarizing topics like climate change will empower a more rounded life long learner for our Wyoming students. Our educational goal is to create and grow student led learning with knowing all facts and sides without pre-conceived notions, and basing knowledge on fact, as opposed to perceived fears.
4/14/2016 9:03:06			
4/14/2016 10:19:07	Cheyenne, WY	**Recomm. as is**	Look good

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/16/2016 14:58:29	Casper	**Recomm. as is**	I think the standards look good as they are.
4/19/2016 8:21:43	Casper	**Sugg. minors edits**	Thank you for all your hard work. I really appreciate the work that you put into the proposed standards. The cross-curricular connections between ELA, social studies, and math are very helpful and easy to find/read. 1. What type of resources will be available to classroom teachers to support the standards? Will the use of the resources be mandatory or optional? Where will the resources be stored? 2. What type of assessments will be required from NCSD#1? 3. Will teachers be responsible for creating assessments? 4. Will the Kindergarten standards will be with prompting and support like most ELA standards are? Will a clarification for these three standards be included? I think one is needed for each. 5. The Engineering, Technology, & Application standards are listed for K-2. How are those standards envisioned to be implemented over time? 6. Is the life cycle of an animal (ex: chick) still included?
4/19/2016 8:21:44	Casper	**Sugg. minors edits**	1. What type of resources will be available to classroom teachers to support these standards? Will the use of these resources be mandatory or optional. Would it be possible to store the resources at the depot if they are in the form of science kits so that teachers could check them out as they see fit? 2. What type of assessment will be required from the district? 3. Will teacher be responsible for creating formative assessments? 4. Will the science standards for Kindergarten be with prompting and support like literature and informational text standards are? 5. On the engineering,technology and applications standards that are listed for grades K-2 - how do you envision these standards be implemented over time? Will a clarification statement be included on the document as these standards seem broad and vague 6. I do appreciate the amount of work that was put into these standards to extend them across the curriculum. 7. Will our reporting tool (i.e. report card) be aligned to the science standards?

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/19/2016 8:21:44	Casper	**Sugg. minors edits**	1. What type of resources will be available to classroom teachers to support these standards? Will the use of these resources be mandatory or optional? 1b. Would it be possible to store the resources at the depot if they are in the form of science kits so that teachers could check them out as they see fit? 2. What type of assessment will be required from the district? 3. Will teachers be responsible for creating formative assessments? 4. Will the standards for kindergarten be with prompting and support like the literature and informational text standards are? 5. On the engineering, technology & application standards, they are listed for grades K-2. How do you envision these standards be implemented over time? Will a clarification statement be included on the document as these standards seem broad and vague? 6. I noticed that plants and animals are combined in the Earth's Systems standards. Is the life cycle of an animal still part of the standard? In the past we had life cycle of an animal in Kindergarten, life cycle of a plant in 1st and life cycle of an insect in 2nd. Trying to determine if that's still there or gone?? 7. I appreciate the cross-curricular work that has gone into this document. It is very thoughtful and intricate. I do like that we have standards in each of the science areas!
4/19/2016 8:22:42	Casper	**Sugg. minors edits**	1. What types of resources will be available for teaching? Will they be mandatory or optional? Will resources be stored at the science depot for check out? 2. What type of assessment will be required, if any? Will teachers be responsible for our own assessments? 3. Are standards for kindergarten be "with prompting and support" similar to many ELA standards? 4. How do you envision these standards to be implemented over time: Engineering, Technology and Applications of Science. Will each grade level be responsible for these standards? Will a clarification statement be included for these standards? These standards seem very broad and somewhat unclear. 5. Is the Life Cycle of an animal or plant included in these standards? 6. How will these standards be reported for report cards? Positives + 1. I can tell lots of thoughtful work went into this document. 2. The "How to Read This Document" is very helpful. 3. Cross-Curricular Connections are very helpful.
4/19/2016 10:35:30	Pinedale, WY	**Recomm. as is**	Recommend as is
4/19/2016 10:35:47			
4/19/2016 10:37:26			
4/19/2016 10:37:41			
4/19/2016 11:53:40	Worland	**Recomm. as is**	The standards are good.
4/19/2016 12:36:32			
4/19/2016 13:06:51	Riverton	**Recomm. as is**	Let's get going! Adopt them, adapt them but get something on the plate!

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/19/2016 13:40:14	Wheatland	**Recomm. as is**	The 2016 proposed science standards appear to address "language" concerns relative to the initial Next Gen Science Standards. Science is a critical subject for our students to understand and to make intelligent interpretation of information and decisions. It is time to move beyond the inadequate current Wyoming standards.
4/19/2016 14:43:35	Jackson	**Recomm. as is**	I like the new standards are based on a research-based set of standards (NGSS). The format is exciting to me, as the standards show integration with other content areas and cross-curricular themes. This will help position science as a discipline that must be studied in context of other disciplines. The degree that these are specific with assessment guidance, clarification statements, and connections to STEM will be invaluable as districts, schools, and teachers work to align their instructional program to the new standards. I would be thrilled if the State Board of Education adopted these standards for Wyoming students.
4/19/2016 16:18:00	Wheatland	**Recomm. as is**	I like the way the standards are broken out per grade level and clearly outline what should be taught at each grade level.
4/19/2016 18:38:35	Lander	**Recomm. as is**	The standards are age appropriate and have ideas related to Wyoming. I hope the standards are implemented.
4/19/2016 21:44:27			
4/20/2016 4:29:46			
4/20/2016 11:07:11	Douglas	**Sugg. minors edits**	I like the Wyoming specific tie in and spiraling of concepts through grade levels. The standards do not seem as rigorous as they should be at the specific grade levels.
4/20/2016 11:32:17	Farson, WY	**Recomm. as is**	Standards cover the basic science knowledge needed for students to be scientifically literate people. I do appreciate the "Assessment does not include" areas. Any good science teacher can fulfill these standards.
4/20/2016 14:55:57	Gillette	**Sugg. minors edits**	I think that the kindergarten standard of constructing something to show it can block out sunlight is a little odd for kindergarten.
4/21/2016 12:16:21	Douglas	**Recomm. as is**	.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/22/2016 7:54:34	Stow, Ohio	**Have major concerns**	The coverage of origins science (study of the origins of the universe, of life, and of life's diversity) is biased. In particular, unguided (naturalistic) biological evolution is the only theory presented for the development of life on earth. Scientific evidence inferring teleology (intentional design or purpose in nature) is omitted, and students/teachers are left with the impression that the universe and life can be fully explained by unguided materialistic causation. The following are specific standards for which modification should be considered: Age-appropriateness. Benchmarks MS-LS3-1, MS-LS4-1 and MS-LS4-2 involve descent from a common ancestry (biological evolution). This topic is age-inappropriate for middle school students, and coverage should be delayed until high school life science. MS-LS3-1. Revise to state that nearly all random DNA mutations are harmful or neutral; very few could be called "beneficial." The long-term consequence of accumulated random mutations is declining fitness of the organism – and eventual extinction. MS-LS4-1. The intent is to guide students towards acceptance of unguided common descent (macroevolution). The fossil record can be interpreted in terms of either common descent or common design. The statement that "natural laws operate today as in the past" wrongly excludes the possibility of teleological involvement in certain singular past events. MS-LS4-2. This Benchmark wrongly assumes that evolutionary relationships exist. Common descent (or macroevolution) is a hypothesis, not a proven fact. Anatomical similarities (homologies) can be explained by either comment descent or common design. Types of evolution. Benchmarks MS-LS4-4, MS-LS4-5 and MS-LS4-6 all involve adaptation (microevolution) rather than common descent (macroevolution). Micro- and macroevolution are fundamentally different, but the standards do not distinguish them. Microevolution (small-scale change within a species) is operational (present day) science for which observation and experimentation are appropriate methods for inquiry. Macroevolution (large-scale change involving new body parts and plans) is historical (origins) science, which must be studied by the method of multiple competing hypotheses. Explanations developed for microevolution do not necessarily apply to macroevolution. HS-LS1-6. Some factual errors need to be corrected. In the Benchmark and Clarification Statement, "hydrocarbons" should be replaced by "small organic compounds" or something similar. A "hydrocarbon" contains only carbon and hydrogen. In the DCI, sugars do not have "backbones" per se. Instead of "their hydrocarbon backbones" one could simply say "they." HS-LS4-1. The Benchmark is strongly biased towards common ancestry (macroevolution). Common ancestry may or may not be true; the possibility of teleological causation should also be considered. It is surprising that the writers leave "embryological development" in the Benchmark, since they eliminated a middle school Benchmark (MS-LS4-3) on this topic. Micro- and macroevolution. HS-LS4-1 should be labeled "macroevolution," and HS-LS4-2/5 should be labeled "microevolution." HS-LS4-2. The word "random" should be added before "mutation." HS-LS4-5. Any new "species" emerging via environmental changes will closely resemble the original species. A suggested modification would be: "(2) the emergence of new varieties or even species over time." HS-ESS1-2. Big Bang theory implies a beginning to the universe, and logically any physical entity that has a beginning must have a Beginner (Designer/Creator). This implication of Big Bang theory should be stated. The fact that the physical parameters in the universe are fine-tuned for the development of intelligent life should be included. Origin of life. A notable omission is the lack of a standard on the origin of life. This topic explores numerous mysteries, such as: (a) How did complex specified biomolecules like DNA and proteins first arise? (b) What is the origin of the functional information in the genetic code? (c) How were the parts of the first living organisms assembled? (d) How were the mechanisms for necessary life processes (such as protein synthesis and reproduction) first put into place? Both materialistic (naturalistic) and teleological hypotheses for these questions should be considered.
4/22/2016 15:30:03	Lander	**Recomm. as is**	Adopting NGSS is a positive move forward in science education.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/24/2016 10:37:38	Casper	**Other**	I appreciate what is trying to be achieved with these standards. I would be more on board with applying these standards as is, IF students were ONLY tested in the third, fifth and eighth grades. Standards are helpful if presented in a simplified form and as guidelines for education. I liked the clarification statements, they provided a "real world" example for the benchmark. In the lower primary grades (K-2) students and teachers need more flexibility for instruction as each child develops at a different rate and should not be forced to try and learn something they are not developmentally ready for.
4/24/2016 19:29:49	Cody	**Recomm. as is**	The standards are well written and meet the needs of students, especially cross cutting concepts and the science/engineering practices embedded into the disciplinary concepts. These standards expect students to think like scientists and recognize that science is interwoven in all aspects of life.
4/26/2016 7:29:59	Thermopolis	**Recomm. as is**	I would like to see the State Board of Education recommend these standards as is.
4/27/2016 10:43:19			
4/27/2016 12:10:44	Jackson	**Sugg. minors edits**	I feel we are moving in a great direction with the current science standards. I like the majority of the language of the standards, as well as the high-level thinking that will go in to mastering them. The layout of the document is well organized and the additional information provided for each standard is helpful. I would strongly suggest adjusting the language of the standards that deal with argument. It is fantastic to see that students will be writing and speaking around various arguments. However, as they are currently written, these are not arguments. Let's look at MS-PS2-4 as an example. The standard states, "Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects." As written, students really have nothing to argue. There is no choice in what to argue - they are simply to argue truth and fact. A true argument offers students choice - where students have to determine a claim and then prove their claim to be true. Right now, though the language of the standards is to "argue," students will simply write an explanation of why the statement is true. Here is a better explanation of argument (greater detail can be found in this link: http://relatingresearchtopractice.org/article/224) "An argument is a claim that justifies a belief using data and warrants. A substantial degree of tentativeness is associated with an argument, without which, there would not be any reason for the argument itself (p. 629). The questions that must be resolved through argument are about whether the proposed explanation accounts for all the known facts, and whether that explanation does it better than all the other possible explanations." A better way of constructing the current standards that involve argument are to keep them open-ended, so that students have to come to conclusions through the learning that takes place in the classroom.
4/27/2016 21:11:07	Jackson	**Have major concerns**	Wen I read over the standards for my grade levels (4th and 5th) as well as the vertical alignment, I see really specific benchmarks. That's not necessarily bad sometimes, but I feel like they are so specific in this case that students won't find the joy or beauty in the broader subject itself. Learning the basics with somewhat broad strokes at a lower elementary level allows for passion and interest and true inquiry to develop throughout the upper elementary grades. I would like to see a broader base of scientific understanding reflected at the lower levels that builds towards specificity at the higher levels.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/28/2016 16:20:38	Lander	**Recomm. as is**	I support Wyoming Science Standards that include climate science and human activity. I support the incorporation of the following sections that are important in helping students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 9:36:18	Lander	**Recomm. as is**	I believe it is imperative our children are introduced to concepts of human impact on climate throughout their education. To prepare our graduates to be both innovators in energy technology as well as competitive candidates in the work force Wyoming must offer a science education informed by the most current scientific information available. Additionally, we must teach our students critical thinking skills to help them analyze information objectively.
4/29/2016 10:20:06	Lander, WY	**Other**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 10:30:56	Cody	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 10:42:41	Lander	**Recomm. as is**	I support these standards.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/29/2016 10:56:22	Lander	**Recomm. as is**	I support these rigorous science standards for Wyoming. I especially support the way that topics related to biological evolution and human impacts on the environment are introduced through scientific evidence and discovery. I also support the ways these standards encourage students to make critical observations and come up with new solutions to problems, such as climate change.
4/29/2016 11:08:20	Lander	**Recomm. as is**	Appreciate the thoughtful work put in to these guidelines. I am pleased with the standards that include topics regarding climate science and human activity. Specifically: Core Idea ESS3: Earth and Human Activity (page 160-164) and HS-ESS3-2 through HS-ESS3-6 (page 239-243). I especially like that the subject matter is taken seriously but without hysteria.
4/29/2016 11:32:06	Lander	**Recomm. as is**	Educating students about the real and proven science that climate change is real and happening is important for Wyoming students to learn. I am in favor of maintaining the wording in the standards that supports that.
4/29/2016 11:38:00	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 11:40:18	Lander	**Have major concerns**	“I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/29/2016 13:37:20	Lander, WY	**Sugg. minors edits**	Wyoming Science Standards should include the peer-reviewed science on the topics of climate science and human activity. I have published a study about creative problem solving: I support these sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
4/29/2016 14:01:33	Lander	**Sugg. minors edits**	I write on behalf of myself and my wife Jill Calder. I am copying the following prepared statement after reviewing the guidelines. I agree with adding language encouraging awareness of the connection between human activity and the health of both local and global ecosystems. We support Wyoming science standards that include topics regarding climate science and human activity. We especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important Thank you for considering our input. Respectfully, Bill and Jill Calder, Lander physician and nurse and residents of Fremont County, for 29 and 17 years respectively
4/29/2016 14:20:14	Lander	**Sugg. minors edits**	I appreciate that topics relating to human-caused climate change are included in several sections of the content and performance standards, especially in the middle school and high school sections. In the 5th grade curriculum, I would like to see specific connections made between personal actions, such as energy conservation, recycling, or choosing to bike rather than drive, and environmental consequences including human-caused climate change. Thank you for your efforts in this process!!
4/29/2016 14:37:28	lander, wyo	**Sugg. minors edits**	I support Wyoming Science Standards that include topics on the cause and effect of global warming. I specifically support the proposed sections k-ess3-3; 4-ess3-1 amd 5-ess3-1
4/29/2016 20:11:13	Lander, Wyo.	**Recomm. as is**	Continuing down this organizational road is something I feel has a strong validity.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
4/30/2016 10:38:33	Lander	**Recomm. as is**	I believe that these standards as presented are an improvement and a long-awaited updated. Each of the standards presented here are rigorous per grade level, challenging and set a good path for our kids' learning and knowledge of the sciences and world around us. Specifically, they properly include the "politically charged" issue of people's interactions and potential effect on climate. In the Earth and Human's Activity (ESS3) sections for all grade levels, I believe that the standards provide unbiased, yet important challenges for students to investigate and learn about this important topic. Omission of these topics would have been unacceptable for the times in which we live. As a whole, these standards present and set the course for scientific topics clearly, unbiased and rounded.
4/30/2016 15:31:35	Lander	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/30/2016 17:22:24	Lander	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/1/2016 6:17:43	Lander	**Recomm. as is**	"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/1/2016 13:53:22	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/1/2016 16:10:09	Laramie	**Recomm. as is**	I appreciate the work evident in these standards and support their adoption. As a geologist working in the energy industry I am well aware of the challenges that adaptation to Climate Change presents to society and to Wyoming in particular, but believe that an open dialogue based in science will present our best path to resolving the issues it presents. Therefore I note in particular my support of topics pertaining to climate science and human activity, including K-ESS3-3, Earth and Human Activity, 4-ESS3-1, Earth and Human Activity, 5-ESS3-1, Earth and Human Activity, Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity, and High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (especially Human Impact on Earth Systems and Global Climate Change). While the public policy issues surrounding Climate Change are complex and controversial, the basic science is clear and it is important to me that my middle-school aged son and his peers learn these issues and become equipped to productively engage in the problem solving and public dialogue as our society seeks to adapt and respond to Climate Change.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/2/2016 5:45:31	Lander	**Sugg. minors edits**	I am glad to see that human caused climate change is addressed in Wyoming's new science standards. I believe that human caused climate change is a very serious challenge that our generation is passing onto future generations. I know that there will be objections to exposing our children to this information. However, I also believe that to dismiss the topic of climate change out of hand because you do not agree with the answer is neither science nor education. Whether your background is in industry, finance, health care, agriculture, recreation, education or service climate change is a part of your life and we need to work toward addressing it. We want to send our children out into this world with their eyes wide open, not shielded by blinders that will only hamper their progress. Thank you.
5/2/2016 6:09:58	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100);
5/2/2016 6:51:13	Lander	**Sugg. minors edits**	As one of the biggest technical challenges facing us today and especially for future thinkers and doers, I would like to see a strong inclusion of climate change science. Regardless of the politics, knowledge is the key and thats why we have science to begin with.
5/2/2016 8:35:04	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and the impact of human activity on our natural resources and the plants, animals and waters on which all life depends. I support science standards that help students develop creative solutions to the problem of climate change.
5/2/2016 8:49:15	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human impacts to the global ecosystem. I support sections that help students develop creative solutions to the problem of climate change. Specifically, I support the following sections: - K-ESS3-3, Earth and Human Activity (page 18); - 4-ESS3-1, Earth and Human Activity (page 82); - 5-ESS3-1, Earth and Human Activity (page 100); - Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. - High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are important.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/2/2016 9:19:58	Lander	**Sugg. minors edits**	"I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/2/2016 9:38:46	Lander, WY	**Recomm. as is**	I strongly support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop awareness of and creative solutions to the problem of climate change: K-ESS3-3, Earth and Human Activity (page 18); 4-ESS3-1, Earth and Human Activity (page 82); 5-ESS3-1, Earth and Human Activity (page 100); Middle School Earth & Space Sciences, Core Idea ESS3 (Earth and Human Activity, page 160-164); High School Earth & Space Sciences, Earth and Human Activity (HS-ESS3-2 through HS-ESS3-6, page 239-243).
5/2/2016 12:30:06	Laramie	**Sugg. minors edits**	Minor edit on p. 46 to add a closed parenthesis to the SEP box in the bullet point (perhaps after "media"). Minor edit on p. 162 to change the "HS" icon to a "MS" icon. In addition, I want to commend this group on developing Wyoming-specific science standards that have incorporated a strong emphasis on identifying problems and developing solutions to those problems. The active nature of many of these standards allows students to explore key concepts in the sciences rather than being lectured on those concepts. I also wholeheartedly support the inclusion of direct mention of the effects of human activity with respect to climate change (especially pages 164 and 242). These standards will do much to develop future generations of critical thinkers and problem-solvers who are not afraid to face challenges. We want students who understand the way the world works and are not limited in their knowledge base.
5/2/2016 14:52:03	Lyman	**Have major concerns**	I do not think, if we are going to adopt science standards, that we should adopt such broad ones. I think the time should be taken to have specific standards for each grade level. K-2 is a pretty big range. For example, the standard of using certain tools to block the sun (like an umbrella) is good for K, but not for the other two grades -- especially second. I think each grade needs specific things to teach. Like with reading and math, we should have a clear path to guide students towards successful science education in the next grade and eventually high school. There should be a scope and sequence to our science education. The nature of these standards, and how general they are, is a waste of time and lack effectiveness.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/2/2016 14:54:39	Lander	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/2/2016 15:28:07	Lander	**Recomm. as is**	I support science standards that include climate science and evidence of human impact.
5/3/2016 10:41:49	Douglas	**Recomm. as is**	The Wyoming Science Standards cover the benchmarks needed for students.
5/4/2016 7:27:25	Lander	**Sugg. minors edits**	"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/4/2016 15:55:16	Lander	**Recomm. as is**	I appreciate the committee identified and linked CC standards from other content areas that can be addressed. However, as with common core standards, there are just too many to teach. We want to go deep not be too broad.
5/5/2016 14:03:30	Worland	**Recomm. as is**	In reviewing these standards, it is obvious that significant time and effort has gone into this process. The "Steamboat" symbol has helped our district to share the uniqueness of these standards as they relate to Wyoming. Nicely done.
5/5/2016 15:02:28	Gillette	**Recomm. as is**	I believe the way the standards are now are a great outline for Science
5/5/2016 20:23:41	Lander	**Recomm. as is**	Recommend as is

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/5/2016 21:38:34	Lander	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/6/2016 10:47:51			
5/6/2016 22:45:33	Gillette	**Recomm. as is**	In see these new standards as a slightly softer version of NGSS which I liked as well.
5/7/2016 8:01:15	Laramie	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. It is essential that Wyoming students be taught the science behind climate change without it being watered down for political reasons. The science is well-established. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/7/2016 9:07:51	Lander	**Recomm. as is**	Thank you for the opportunity to comment on these standards. I am very supportive of Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/7/2016 9:55:48	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science. In particular, I support inclusion of material that introduces the potential connections between climate and human activity and fosters a spirit of inquiry and exploration. I especially support the topical discussions and instruction that help students develop creative solutions to the problem of climate change over time. These learning opportunities help prepare children for the real issues that will face them in their adult lives. I would not support changes to the current standards that would remove these opportunities for learning.
5/7/2016 20:03:33	Lander	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/8/2016 17:49:17	Lander	**Recomm. as is**	So appreciative of the inclusion of climate science.
5/8/2016 21:11:12	lander	**Recomm. as is**	I very much support the standards that include topics about earth and human activity. I love sections that give students the opportunity to troubleshoot options for climate science. Here are the sections from your online document that I am referring to: 1. K-ESS3-3, Earth and Human Activity 2. 4-ESS3-1, Earth and Human Activity 3. 5-ESS3-1, Earth and Human Activity 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity. In particular, subsections (C): Human Impact on Earth Systems and (D) Global Climate Change are very important for kids to be learning about so they can make educated decisions as adults. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 are also very important for similar reasons. I appreciate that these standards are spread throughout K-12 and not only taught in one or two years.
5/9/2016 10:58:09	Laramie	**Recomm. as is**	I support science standards that help us all recognize the reality of climate change and grapple thoughtfully with the human activities that contribute to it.
5/9/2016 11:14:15	Lander	**Sugg. minors edits**	I find it problematic that there is such a separation in the standards from humans and the rest of the living world. I would like to see more "cross connections" made to our place in all of the science that is being learned and that we are not separate from the rest of the world. There was a statement that "animals take in food and plants make their food" to actually paraphrase it. More correctly, both animals and plants take in nutrients and modify them for their needs. These are just some of the examples of small changes that should be made. I like the idea of emphasis on "mistakes" and "failures" are all part of the scientific process, and should be learned from.
5/9/2016 11:22:03	Wilson	**Other**	We support teaching accurate, up-to-date climate science in our public schools

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/9/2016 11:27:58	Laramie	**Have major concerns**	I only support Wyoming science standards that are intentional about teaching climate science and the relationship to human activity.
5/9/2016 11:40:05	Wilson, WY	**Sugg. minors edits**	I support science standards at a national and state level that include topics regarding climate science and human activity. It is too late to ignore this harsh reality and will only help the next generation of problem solvers to thoroughly understand the problem and it's (real) causes.
5/9/2016 11:59:53	Cody	**Have major concerns**	I am on a satellite hookup and downloading the full PDF was not working. I did review the introductory documents and appreciate the statement of general objectives. On the other hand, I have been involved in some meetings and discussions about the science standards. I believe this continue to be issues. First, the impact of human activity on climate change must be openly and objectively explored. It is astonishing how out of step Wyoming is on this issue and our head-in-the-sand approach to it. Second, science starts with observation and experimentation and the development and testing of theses. It starts with the facts. Religion starts with a faith. Evolution is not a theory; it is science's best explanation for the development of life on earth. I was a headmaster of a private independent school in New England. I often wonder how much time (teacher and student), money, and resources schools spend teaching creationism or intelligent design. My own 12 years as a student in the Cody School System was science only, and I was well served by it as I went out in life. The formation of the planet and its development have been developed and revealed by geology. Religion's answers, perhaps comforting, have no basis in science. There is an vital place for faith and religion in our lives, but we cripple our students in the world marketplace of ideas and employment if we continue to pass off some tenets of faith as science. Thank you for your time and consideration.
5/9/2016 12:36:10	Gillette	**Recomm. as is**	First I would like to say that I am glad Ana Houseal from UW was part of this committee. Since my district, Campbell County, has been working with her for the last 3 years on a STEM grant and I don't see anybody from my district represented at this state level. I know our district is far in implementing science instruction at a very high level and I am sad that we weren't represented when considering what is going to drive the whole state. After working with the NGSS through STEM the past 3 years I have become very familiar with both the NGSS and how they fit into our current state standards. From looking at what I teach currently and the integration of the NGSS through this draft I like what I see. It is easy to read, I like the clarifications, and I see all the parts to it that we have already been implementing and find necessary and valuable.
5/9/2016 13:02:19			
5/9/2016 13:04:31			

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/9/2016 13:30:06	Wapiti	**Have major concerns**	I found the proposed science standards quite interesting, both for what they do and do not do. In evaluating these comments, please be aware that I focused on the elementary school standards because I have kids of that age. Finally, note that I am a Certified Interpretive Guide and an accomplished interpreter of both natural and cultural history for adults and children. I understand that educators have developed a systematic way of writing these standards that is intended as a shared foundation for the teaching of science. And perhaps I don't see what's going on here, but just the organization of the standards strikes me as reductionist (mechanistic if you want another word). We are fortunate to live in a fabulous laboratory of both nature and history and I don't see that reflected back at me in the organization of these standards. Nor do I see it in how my kids are being taught. The standards do include many important fundamental bits and pieces. But I do not see how science as a method or an overall understanding of how the world works is going to emerge from these bits and pieces, nor do I see that as a goal anywhere in these standards. I fear that this reflects educators' response to recent Legislative actions. I worked in the public sector of much of my career and "get" that issue. But it is pointless to pretend that you are teaching science if you are not explicitly addressing climate change and how that is impacting life in Wyoming on so many different planes. I think the same is true of other issues, like say big game migration. I understand that the standards allow teachers some freedom and that some of these issues are going to come into some classrooms. But if we are going to attempt to have over all standards that are unique to Wyoming, let's teach the fundamentals using our resources and issues. I know a great deal of work went into this document, and I appreciate that, but it falls far short of the potential.
5/9/2016 13:36:15	Lander, WY	**Sugg. minors edits**	As a Wyoming parent, I am greatly concerned about efforts to undermine science education by removing or changing critical evidence-based educational standards related to human-caused climate change. Please do not let Wyoming science education fall below the rest of the nation and the world by removing or changing common core science standards related to anthropogenic global climate change.
5/9/2016 14:23:45	Casper	**Have major concerns**	I find an almost complete lack of content regarding the carbon cycle (mentioned but without reference to man's participation in it), climate change theory, and renewable energy resources. I understand that these are fraught topics in Wyoming, but ignorance of them will help no-one. Even if people here ignore the evidence of climate change, both the reality of it and the perceptions of people elsewhere about it will profoundly affect Wyoming's economy and markets. Wyoming has huge potential for increased renewable energy production. Our students should be on top of that.
5/9/2016 14:42:49	Cody	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity.
5/9/2016 14:54:54	Rawlins	**Recomm. as is**	I was particularly pleased to see that two controversial topics (that should not be controversial)...human impact on the environment on local and grand scales and natural selection as the key factor in species' adaptation and survival....were not soft pedaled. Indeed, the standards say in several areas that "empirical evidence" and "mathematical modeling" will be used to assess the evidence. Nice.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/9/2016 15:01:38	Pinedale	**Sugg. minors edits**	Dear Wyoming Department of Education: I support teaching accurate, up-to-date climate science in Wyoming public schools. I support Wyoming science standards that include topics regarding climate science and human activity. Further, I recommend that the WDE revise the 2016 science standards to include the most recent, relevant data describing the link between global climate change and human activity. After all, today's students are tomorrow's stewards of the environment. Wyoming would be negligent to allow the next generation to inherit a planet they do not understand. How can you expect a person to respect the planet when they are not properly educated about it's most pressing threats? By now, Wyoming should recognize that climate change is NOT a political issue -- it is an economic issue, an environmental issue, but most of all -- it is an issue that requires immediate action! Wyoming students deserve to be kept informed and up-to-date of climate science. Do not let our students fall behind the rest of the nation because of ignorant political agendas! Thank you,
5/9/2016 15:06:09	Lander, WY	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/9/2016 15:09:28	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); I suggest adding a bullet to the Science & Engineering Practices regarding: "Humans have altered the earth's climate. What can we do to limit our impact on climate change?" 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important. I suggest adding "oceanic life" to the bullet regarding "Global Climate Change" as follows: "Through computer simulations and other studies, important discoveries are still being made about how the ocean and oceanic life, the atmosphere, and the biosphere interact and are modified in response to human activities."

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/9/2016 16:34:43	Lander	**Sugg. minors edits**	I am glad to see these standard address the topic of climate change and human activity, but feel they could go even further in drawing a direct correlation between fossil fuels, greenhouse gasses, and climate change. This is probably a good start and the best one can expect given the current political climate. Thank you.
5/9/2016 16:36:34	Kelly	**Sugg. minors edits**	I feel that rather than the individual activities/projects that are recommended in the standards that the standard show address content and it be up to the teacher/school district to interpret this. For example, instead of defining an experiment about light and shadow; the standard should read that students will investigate light sources. Recommendations about possible activities/projects would be great, but by being as specific as the standard is makes it hard for teachers to be flexible.
5/9/2016 16:46:26			
5/9/2016 17:10:45	Jackson	**Have major concerns**	I want to see objective reporting of the best science in all area. In Wyoming I fear that some aspects of reporting on pollution, and climate change research is distorted. There's lots of resistance from special interests when, for example our atmospheric pollution mentions coal mines. An implication is that we have fish consumption advisories on our fishing regulations because of mercury levels which are elevated because of atmoshperic levels of mercury from power plants fueled by coal. Likewise, climate change data should be fairly reported and special interest funded research should be labeled as such, and best science characteristics, such as representative sampling of data sources and peer reviewed reports sh should be explained.
5/9/2016 18:33:34	Wilson	**Other**	Support science standards including climate science and human activity.
5/9/2016 21:23:20	Cody, WY	**Sugg. minors edits**	The only thing I am concerned about is just in the way these standards are taught as it relates to Climate Science or what is called Global Warming. I would want to make certain that teachers do not teach the theory of man caused global warming as a fact. Regardless of whether or not global warming is fact, I think the idea as to whether or not it is human caused, should be left out or at most taught as one of many theory's to explain climate change. It is popular in today's media for people to speak of man caused global warming as fact. These standards need to make clearer that man caused global warming is only one of several theory's to explain climate change cycles.
5/9/2016 21:44:49	Lander, WY	**Sugg. minors edits**	I support a strong science curriculum that includes the study of global climate change and the known impacts of human activity on our climate. The Earth and Human Activities sections, in particular pages 18, 82 and 100, and the Middle School Earth and Space Sciences Core idea ESS3 contain knowledge that I believe is critical for my two daughters, ages 12 and 10, to know and understand. We will do our children a grave disservice if we exclude factual, accepted science from their educational experience. This, in turn, does our planet a grave disservice, since this generation and the ones to come will be called upon to help solve the problems caused by climate change.
5/9/2016 21:54:57	Jackson	**Sugg. minors edits**	I would like to see up-to-date climate science in all levels of education, including discussion of the roles of humans in climate change , with the hope that our students can help find solutions to the problem of increasing global temperatures due to human activities.
5/9/2016 21:56:34			
5/9/2016 22:29:21	Lander, WY	**Other**	Standards are acceptable as is, I support the continued requirements for standards that cover evidence for human influences on climate

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 6:27:27	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I believe that it is essential for Wyoming students to learn this information. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/10/2016 6:29:34	Wilson	**Have major concerns**	Please teach climate science starting in grade K and build on it each year through grade 12. Climate change will profoundly affect the large portion of Wyoming's economy that is rooted in coal, natural gas, and oil. It will drive the creation of more wind farms and solar fields. It will alter the array of plant and animal life throughout Wyoming, and its effects on Wyoming's second largest industry, tourism, will also be significant. Please teach students the basic physics of the phenomena, help them understand Wyoming's risks and opportunities, and include exposure to political, ecological, and economic factors at work as well. Climate change will be a major driving influence in Wyoming, so let's please be leaders in its scientific roots and its measurable consequences. Thank you.
5/10/2016 7:11:54	Cheyenne	**Have major concerns**	, "I support Wyoming science standards that include topics regarding climate science and human activity."
5/10/2016 7:38:40	Lander	**Recomm. as is**	I appreciate science standards that incorporate concepts, facts, theories that are based on scientific evidence, as these are. I support teaching Wyoming students about how human activities affect our world and specifically providing them with information that will enable them to help resolve the challenges they will face. Thank you for including facts about climate change, regardless of the political implications.
5/10/2016 7:43:10	Cheyenne	**Recomm. as is**	Adopt these science standards. Climate change is real. The boom and bust cycle of oil and gas production has once again proven this is not a sustainable model for Wyoming. Governor Mead, take the politics out of bringing cutting edge science to Wyoming's classroom and support the Next Generation Science Standards and the educators who worked so hard to align these standards with what should be taught in Wyoming's classrooms.
5/10/2016 8:18:03	Laramie	**Recomm. as is**	I support the science standards regarding climate change and human activity. Students need to be educated on the best science available, supported by the vast majority of climate scientists worldwide.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 9:32:37	Rock Springs	**Have major concerns**	I am a biologist with a PHd, and taught at the college level for several years. I am retired, but take ceramics classes at the local community college, where I interact with students that have just come through the k through 12 system. The major point that I would like to make is that the reasoning ability of students that complete high school in Wyoming is terrible. Deductive reasoning and the scientific method should be taught to all students, not just those in advanced scientific based courses. As a working scientist I can tell you that to most of us "Science" is far more about the approach to drawing conclusions than the body of knowledge that results from this approach. Secondly, I would argue that the section on climate change needs to be revised. Warming of the Earth's atmosphere from burning of fossil fuels is as well established as a concept like gravity. To suggest that there is legitimate disagreement over this fact is disingenuous, and reflects poorly on the reasoning ability of the education establishment of the state. There are economic reasons why the state should support some use of fossil fuels and I would argue that these arguments should be made. The credibility of these economic arguments is seriously undermined when you take the approach of questioning the human driven component of climate change.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 10:05:08	Casper	**Other**	These are essentially the Next Generation Science Standards; to label them as otherwise ("Wyoming Content and Performance..") is disingenuous. These are the same in intent as the national NGSS which received a "C" grade from The Fordham Institute, which also graded Wyoming's previous standards at an "F". The WY/NGSS are highly political, both in the content and methodology. There are also numerous errors in fact, errors in concept, a lack of clarity (why are Clarification Statements needed?), severe restrictions on what will be assessed/teaching to the test (Assessment Boundaries), and an unfortunate dearth of foundational vocabulary and associated critical concepts. How can science be taught without the following, all of which are missing or rarely mentioned in these standards? Numbers following the selected words indicate how often the word appears in these standards. scientific method - 0; reproducible results – 0; hypothesis – 1; theory – 11 Jurassic - 0; Triassic - 0; Cretaceous - 0; igneous - 0; metamorphic - 0; lava – 0; magma – 0; melt – 7, 2 are wrong; fracture – 1; coal – 1 Page 239; drill – 0; sequestration – 0; Wegener – 0; Milankovitch cycle – 0; Hadley cell – 0; El Nino – 0; La Nina – 0; astronomy – 0; Galileo – 0; Copernicus – 0; Newton – 14; Einstein – 0; Hubble – 0; Doppler – 0 Page 226; Harlow Shapley – 0; None of the planets by name; Nothing about comets; eclipse – 1; umbra – 0; penumbra – 0; GPS – 0; global positioning satellite – 0; resolution – 0; optics - 0; ultraviolet - 0; infrared – 0; x-ray – 0; spectrum – 0; gamma – 1 Page 181; ph scale - 0; acid - relative to chemistry - 0, 5 in LS (amino); alkaline - 0; circuit - 1, Energy 4-PS3-4; Ohm - 0; voltage - 0; resistance - 0; Watt, watt - 0; electricity - 2; electric(al) circuit, 1 in 4-PS3-4; battery – 0; laser – 0; radar – 0; computer science – 0; program – 0; code – 0; Morse Code – 1; telegraph – 4; bit – 0; byte – 0; pixel – 2; memory – 3; ROM – 0; RAM – 0; 3-D printing – 0; Root cause analysis – 0; Simple machine - 0; axle - 0; wheel - 0; inclined plane - 0; lever – 0; fulcrum - 0; pulley - 0; screw - 0; wedge - 0; robot - 1 in K-2-ETSI Identify how science or technology affects production (e.g., assembly line, robots, and video streaming). taxonomy - 0; domain - relative to taxonomy - 0, other uses - 7; kingdom - 0; phylum - 0; class - relative to taxonomy - 0, other uses - 12; order - relative to taxonomy - 0, other uses - 60; family - relative to taxonomy - 0, other uses - 1; genus - 0; endothermic - 0; exothermic - 0; capillary - 0; cancer - 0; recessive - 0; dominant – 0; On Page 172, the following statement is made: "These standards and benchmarks include the most fundamental concepts of science, but are intended to leave room for expanded study in upper-level high school courses." This is not true. Just based on the short list provided above, many of the most fundamental concepts of science are NOT included. This also counters the Rationale statement: “The standards we present here provide the necessary foundation for local school district decisions about curriculum, assessments, and instruction. Implementation of the new standards will better prepare Wyoming high school graduates for the rigors of college and/or careers. In turn, Wyoming employers will be able to hire workers with a strong science and engineering base — both in specific content areas and in critical thinking and inquiry-based problem solving.“ These standards will not lead to Wyoming students having a "strong science and engineering base" nor will students emerge with "critical thinking skills and inquiry-based problem solving" - not when the "simple machines" are missing, there is no "scientific method" and chemistry and physics are barely covered. What are the political topics I object to? Again, I refer you to a vocabulary search: climate – 53; climate change – 13; severe weather – 8 total, 5 in K, 2 in MS, 1 in HS; solar (energy) – 8; human impacts – 15; model – 556; argument – 118; debate – 0 Look at HS-ESS2-4. "Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate." "Clarification Statement: Examples of the causes of climate change differ by timescale, over 1-10 years: large volcanic eruption, ocean circulation; 10-100s of years: changes in human activity, ocean circulation, solar output; 10-100s of thousands of years: changes to Earth's orbit and the orientation of its axis; and 10-100s of millions of years: long-term changes in atmospheric composition." With this statement, these standards are declaring that "changes in human activity" have an equal temporal and scale impact on the energy flow of Earth as do the circulation of the oceans of this planet and the output of an entire star! This also declares that human activity has more impact on said energy flows than a volcanic eruption. Does anyone in the Wyoming education industry and political class really accept and support these ludicrous ideas? This is junk science - can you really not see that? How this standard and many other equally political and/or absurd statements in the WY/NGSS have passed numerous reviews in this state and are being considered for adoption indicates a complete and total abdication of your collective responsibilities as public officials and users of public funds. I am happy to reiterate these written statements and others in any public fora and have done so previously. Do you have the strength of your convictions to debate me in public on these topics? Please consider yourself challenged by me to defend your positions on these "standards" in public.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 11:33:46	Lander	**Sugg. minors edits**	I believe it is especially important that the following sections be included to help students develop creative solutions to problems of climate change. 1. K-ESS3-3 2. 4-ESS 3-1 3. 5-ESS3-1 4. Mid Sch earth &Space Science Core Idea ESS3 5. H.S. Earth & Space Science ESS3-2. - HS- ESS 3-6 I have been anguished to have my 6th grade granddaughter say climate change is not mentioned in school because the science teacher says it is a political issue. How pathetic and ignorant.
5/10/2016 11:44:10	Lander	**Recomm. as is**	I was excited to see the integration of standards that challenge students to understand climate systems and how humans are impacting these systems. There are some great critical thinking pieces in there and opportunities for students to make connections between their own actions (and human actions in general) and creative problem-solving to address impacts. PLEASE keep climate change in the standards as this WILL be an important aspect of all of our lives as we move forward!!!
5/10/2016 13:37:59	Lander	**Sugg. minors edits**	I support Wyoming science standards that include topics regarding climate science and human activity.
5/10/2016 13:43:31			
5/10/2016 14:09:57	Thayne, WY	**Recomm. as is**	I'm pleased to see that all levels of students are expected to engage in argument based on evidence and logic.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 14:10:59	Laramie	**Sugg. minors edits**	I know that the proposed edits below were written by someone else and I copied them. But they represent my thoughts perfectly and express more eloquently than I could what needs to be changed to make the proposed standards acceptable. It does no good to keep information from students; it only makes them less prepard to go into the world armed with the ability to be critical and independent thinkers. I have full faith in the ability of our youth to sift through the information they are exposed to, and to come up with their own truth. It may not be the same as mine, but they have at least been given the opportunity to think for themselves and make their own choices. That is all I would hope for, because when they finish formal education, they will be making their own way and own choices. I just want them to have the requisite tools with which to always be inquisitive, to question, and to know how to make informed choices. The middle school Earth and Human Activity standard MS-ESS3-5 should be clarified by changing the wording to: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. The high school Earth and Human Activity Disciplinary Core Idea for standard HS-ESS3-5 is not aligned with the performance expectation. The core idea about the economically viable extraction of elements does not fit within a standard about analyzing data and results from global climate models. The core idea should be changed to language used in NGSS: Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts. Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.
5/10/2016 14:14:55			
5/10/2016 15:48:19			
5/10/2016 15:51:36	Moose	**Sugg. minors edits**	I support Wyoming science standards that include topics regarding climate science and human activity.
5/10/2016 16:07:41	Cheyenne	**Sugg. minors edits**	Overall, the standards are very good and will form the basis of a strong science curriculum for LCSD#1. I hope they can be finalized and approved and referred to school districts, with professional development assistance, as soon as possible. I found one anomaly in HS-ESS3-5, page 242, which talks about the economics of the mineral extraction industry. I can see a useful exercise in economics or social studies about the cost/benefit of a commercial activity and why some people focus on short-term gain and ignore long-term cost, but I'm not sure it relates to this science standard.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 16:09:48	Jackson	**Sugg. minors edits**	The middle school standard MS-ESS3-5, Earth and Human Activity, should be better clarified by adjusting the wording in this way: Ask questions that will help to clarify the evidence of the factors that have caused the rise in global temperatures over the past century. In the high school standard HS-ESS3-5, the Earth and Human Activity Disciplinary Core Idea isn't aligned with the performance expectation. The economically viable extraction core idea does not fit within a standard about analyzing date and results from global climate models. The language used in NGSS is a better choice for this core idea — the language in HS-ESS3-5 should be changed to match the NGSS language in this regard, as follows: * Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts. * Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere and the biosphere interact and are modified in response to human activities.
5/10/2016 16:19:48	Pavillion	**Sugg. minors edits**	I would like to see some minor edits to these science standards: The middle school Earth and Human Activity standard MS-ESS3-5 should be clarified by changing the wording to: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. The high school Earth and Human Activity Disciplinary Core idea for standard HS--ESS3-5 is not aligned with the performance expectation. The core idea about economically viable extraction of elements does not fit within a standard about analyzing data and results from global climate models. The core idea should be changed to language used in NG SS: --Though the magnitudes of human impacts are greater than they have ever been, so, too, are human abilities to model, predict, and manage current and future impacts. --Through computer simulation and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.
5/10/2016 16:50:33	Casper	**Recomm. as is**	These standards allow teachers and students to look into the various topics using a variety of sources and for each to draw their own conclusions.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 19:44:11	Casper	**Sugg. minors edits**	My concern is that essential Physical Science topics are not included but need to be taught to properly assess the standards that are listed. After doing a search I found that science teachers all over the country agree that Kinematics and Newton's First and Third Laws should be included. The following statement is from Mrs. Bree Barnett Dreyfuss, who has done a lot of work with the standards and has posted content plans that integrate all parts of NGSS as they apply to Physics. "My problem with the specific Discipline Core Ideas (content) for Physics is that there are many traditional concepts not listed. For example, there is a Performance Expectation about Newton's Second Law but the other laws of [motion, and] basic Kinematics, like the differences between acceleration and velocity, are missing. I work with new teachers frequently and I am concerned that they will not think of all the other content that students will need to understand the Performance Expectations." Since Wyoming is writing our own standards based on NGSS, we have the opportunity to correct this omission and create a true "standard" that will serve both new and veteran teachers.
5/10/2016 20:19:37	Powell	**Recomm. as is**	Need to focus on essentials for each grade and make them reasonable to teach before the kids take the state assessment in March

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 22:29:27	Story	**Have major concerns**	Wyoming's education system has recently rated high in many surveys, contests, or comparisons. Which established high expectations for these standards, however, I do not feel they meet the high caliber the people of Wyoming have come to expect. From speaking with professionals within our district (Sheridan #2), I understand the repetition of subjects within the grades is a technique called spiraling. I can understand that perspective and pedagogy. However, I feel more strongly that it lacks the breadth to cover a subject as varied and complex as science. By implementing this technique, too many fundamental aspects and areas of the sciences are being missed or altogether left out. For instance, weather is mentioned multiple times within the standards and throughout the grade levels. Although weather is complex and universal it seems a waste of precious time and resource to repeat when imperative subjects such as agriculture, basic chemistry, and many aspects of biology are not included at all. Agriculture nor wildlife biology do not warrant a single unit of study or assessment within these standards. I feel this is gross mistake, especially considering the state's reliance on agriculture science and industry (as well as the importance of our food system locally and globally) and the unique wildlife populations and environment Wyoming maintains. It also seems that there is a lack of laboratory and other hands-on learning associated with this curriculum. I understand that individual teaching methods and implementation is at the discretion of the teachers and/or districts, but most of the clarifying statements largely focus on discussion points. Research and teacher experience point out that students learn best when actively involved in a subject; often in the form of experiments, hands-on building and projects. If Wyoming is dedicated to have a top-tier education system, it must include projects, experiments, field work, laboratory time, and hands-on learning tools. It was also disconcerting that some of the information within these standards was either not complete, not inclusive or inaccurate. For instance, 5-LS1-1 (Molecules to Organisms. pg 94) states "Support an argument that plants get the materials they need for growth primarily from air and water" and the clarifying statement explains that water and air contribute more than soil to a plant. However, that statement excludes the invaluable contribution of the mycorrhizae, bacteria, insects, and fungi found in and on the soil. Also, within 4-ESS3-2 (Earth and Human Activity. pg 83) the boundary of the assessment is limited to earthquakes, floods, tsunamis, landslides, or volcanic eruptions. It would seem that if the curriculum was to make an impact on Wyoming students, the natural Earth processes (on humans) should include forest fires, tornadoes, avalanches, mudslides, etc. Any of these processes may be more relative to the students; or even better, encourage them to problem solve methods of dealing with these processes. I also have to trust that the media students are asked to use as sources have been either provided by the teacher or librarian or have been vetted. My trust must also be placed in teachers and administrators that even though boundaries have been established for the assessments, that is not where teaching or learning ends. The boundaries are limiting to the natural curiosities of students and the creative power of the teachers. I also hope that this process, the creation and approval of new standards, or at least others in the future, are put forth with honest and collaborative intentions. I have been told that our district has already adopted these standards. Since the timeline for public input has not passed, no taxpayer has been notified of the official adoption, nor results of the review have been published, I am, unfortunately, skeptical of those intentions. I also hope that the professionals working hard to produce quality standards and enable Wyoming students to continually achieve greater things, will revise these standards in such a way that will challenge students, offer a invitation to explore all the area of science, and most importantly, inspire curiosity.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/10/2016 22:41:39	Buffalo	**Have major concerns**	When high school science instructors were asked to give the scientific explanation of the genetic mechanism that allows the theory of evolution to be legitimate, for example where a "simple" organism (say with 1 chromosome, for example sake) "evolves" eventually over time, giving rise to a human (with 46 chromosomes) through the evolutionary tree, they were UNABLE TO GIVE THE GENETIC MECHANISM THAT WOULD ACCOUNT FOR THE ADDITION OF THIS GENETIC MATERIAL BECAUSE IT DOES NOT EXIST. Meiosis (and mitosis) are very exact and when even one base pair is affected, a disease state can take place, leaving the offspring less able to reproduce successfully, not better. No matter how much time goes by if it is the exact process of Meiosis you may get genetic variation but not loads of DNA from nowhere. Science teachers are put in awkward situations when they are asked to defend that which is not supported scientifically. Also there are no intermediate organisms for this "evolution" process of which there should be hundreds of thousands/millions if there are millions of different species with each species having millions of individuals. Fossils cannot be that hard to form since we find fossils of jellyfish. Using the Urey experiment whereby nonliving material is energized by say a lightning bolt to create carbon-containing compounds is just the opposite of logic as living things try to avoid the damaging effects of lightning, it being seen in science today as a destructive force, not a constructive force. This creates a jumble of nonsensical information and even if amino acids or nucleotides were formed that is nothing with the complexity of an organism, but simply art supplies. One needs the artist. In addition, Louis Pasteur already disproved nonliving material giving rise to living material in the 1800s (with his famous broth in swan necked flasks) which is the supposed basis for the whole start of evolution. By going backwards like this, by claiming that which was disproved already as being true and as the basis for the whole evolutionary theory to get started, it is an embarrassment to science. In fact, science textbooks document that in every case so far we find that life gives rise to life. We are to reject the null hypotheses (that nonlife can give rise to life) if in every case so far we find that life gives rise to life---biogenesis). We cannot pretend that maybe it was all different (subjective speculation) and that the laws were different in the beginning. Laws are laws and with the state of our education system is in, we are calling for Leadership in Truth to recognize that the theory of evolution lacks scientific evidence in its end, middle, and beginning. Let us be pioneers in announcing and teaching the exciting news that science has disproved abiogenesis (nonlife giving rise to life) and all evidence so far supports biogenesis (life giving rise to life) therefore supporting that a loving, living Creator has given rise to the amazing diversity of life on the planet, the study of which, we call science. For the sake of our state's educational system, let us humble ourselves and recognize the One who wrote the scientific laws instead of just focusing on who discovered the laws. Obedience to His truth results in blessing. We cannot expect to be in disobedience to His Truth and receive blessing, no more that a disobedient child would be rewarded by a loving parent. The loving parent would discipline, thus the present state of the budget of our educational system. Let us be brave in heart and pioneer the way to Truth for our nation just as we have pioneered in our past. Thank you for allowing this response and for your time to read it. Blessings from our Creator to you.

Timestamp	Town of Residence	Commenter Chose the Following from a Selection	Online Comments on 2016 Proposed Wyoming Science Standards
5/11/2016 11:26:46	Afton	**Sugg. minors edits**	MS-LS-2-5 I'd like to change the wording of the crosscutting concept so as not to imply that small changes in an ecosystem will damage that ecosystem or cause large changes. I don't want my students to think that they can't (interact) with the nature they encounter in the backcountry for fear that it will be ruined indefinitely and thus not go out to explore, learn, and grow from such interactions. MS-LS-4-1 On the clarification statement about organisms becoming more complex over time "finding patterns of changes in the levels of complexity". I don't believe that there is enough evidence in the fossil record to show that anatomical structures have gotten more complex or that all living things have evolved out of a first few simple microorganisms. A few sparse examples in the fossil record just aren't enough for me. I won't present just one idea to my students and not give them some alternative theories on how living things have evolved or have come to be on the Earth. MS-LS-4-4 Core Idea: The wording in this statement implies that traits in the gene pool are being suppressed (still present) when in actuality they may be nonexistent. Saying "suppressed" implies that the genes are still there and in natural selection genes that are selected against are removed from the gene pool through death or non-reproduction. I'd rather it say that the traits or alleles have decreased in the gene pool and thus show up less often. I'm not sure if I missed it but I don't see any standards for taxonomy?
5/11/2016 11:45:56	Jackson	**Recomm. as is**	I am a high school science teacher and my perception is that these standards fairly comprehensively cover the content and skills that students need to both be scientifically aware citizens and to have the scientific background required to be successful in their post-secondary educational/vocational endeavors.
5/11/2016 17:08:59	Casper	**Recomm. as is**	My concern is not with the standards themselves, but with the impact of the new standards. First, these standards are very integrated and utilize many components of STEM educational practices. That is a wonderful thing, however I worry that many teachers, especially at the elementary level, do not have the STEM pedagogical skills to adequately teach these standards. Also, due to the limitations in the elementary classroom such as: time, materials, other program requirements, lack of integration, etc...I worry that our elementary students will receive inadequate instruction to be proficient at a level that encourages success in secondary education. Finally, these standards call for a huge shift in the way science is taught in many elementary schools. I, personally, believe that this is the best thing that could possibly happen in the classroom, but I also worry that there are not the resources to provide this type of quality instruction. Again, personally, I feel comfortable creating this type of instruction myself, but I do not have access to the materials that would be required to teach the standards. Overall, I teach at a school where very little of our subject matter is integrated, and I feel that I will lose even more ground with science if the teachers in my building do not see the importance of integrating these standards into other subjects, and if they do not have the skills to teach the standards at the level required to prepare students. I believe that these issues are probably already being addressed, but I felt that it was important to share them in some form with this team. Thank you for indulging my thoughts and perspectives.
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Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
3/22/2016 19:01:06	Green River	**Recomm. as is**	As is
3/23/2016 9:27:39	Rock Springs	**Recomm. as is**	I am excited about the proposed Science Standards and the alignment that this provides all Wyoming students with other states. The expectations are high and that is a good thing!
3/24/2016 18:29:39	Jackson	**Recomm. as is**	Better than what we had, but NGSS is better!
3/24/2016 19:14:11	Newcastle	**Recomm. as is**	The committee worked hard on making these Wyoming Standards - good job group!
3/25/2016 11:52:08	Douglas	**Recomm. as is**	I feel there is a substantial increase in physics standards and there needs to be an adjustment to certification of science teachers to allow a broad field of science the ability to teach these standards. These standards in conjunction with ptsb put districts at a distinct disadvantage when highering new teachers.
3/25/2016 19:34:10	Cheyenne	**Recomm. as is**	They are great standards & reflect a global perspective.
3/28/2016 9:04:24	Evanston, WY	**Recomm. as is**	As a science teacher, I support the adoption of the NGSS as is. If WY, elects to modify these standards, then they are not standards. Standards are "what students should know and be able to do at each level. The Standards can be used as a reference point for planning teaching and learning programs, and for assessing student progress" locally and nationally. We cannot compare our student data with other states, if we elect to take out performance expectations because our state is highly funded by fossil fuels.
3/28/2016 16:48:13	Laramie	**Recomm. as is**	Very clear and teacher friendly.
3/30/2016 13:44:46	powell	**Recomm. as is**	this is a lot to cover, hope teachers have time and resources provided by their district to get it done.
4/1/2016 11:08:57	Casper	**Recomm. as is**	These standards provide a rich K-12 science education that focuses on processes, interdisciplinary concepts, global thinking, and a deeper understanding of how and why science matters. This approach to science education allows students the opportunity to explore and experience science through their interests and allows educators the opportunity to truly differentiate to meet the diverse needs of our students. As a science educator, parent, and principal I appreciate the honest treatment of evolution and global climate change. Wyoming needs citizens who are articulate in these very important scientific topics that are often politicized. Thank you to the team members who spent the time and energy to produce this quality document that will positively affect Wyoming students.
4/1/2016 13:11:55	Torrington	**Recomm. as is**	The content of the standards proposed seems fine. The language and/or word choice sometimes makes it confusing for the reader. These are items we are required to present to our students and parents. Having the same information written at a level that is more conducive to our clients (kid-friendly if you will) would be helpful. I have no problem explaining to those parents that I can contact directly. However, there are many parents who I never get to see, and they're understanding of the standards is limited at best.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
4/2/2016 13:39:28	Larmamie	**Recomm. as is**	I would like these to be adopted as shown.
4/3/2016 16:51:50	Midwest	**Recomm. as is**	I think the standards represent what we, as educators, want our students to know and understand.
4/4/2016 7:57:12	Cody	**Recomm. as is**	We will need resources to teach these standards. I suggest the district provide a set of approved resources immediately, so that teacher direction can be given before the actual resources are adopted. It is such a sensitive subject, and in the past teachers have been left to scramble for materials and resources until a district resource is adopted. If there is direction up front, there is less chance for questionable material to surface, and teachers are protected from attack by the community for their choice of materials/resources used.
4/7/2016 5:12:19	Jackson	**Recomm. as is**	Excellent work by the committee. The standards are well written to support all students' ability to master standards
4/8/2016 15:13:28	Casper, Wyoming	**Recomm. as is**	I am glad that we finally have a set of standards that emphasizes student performance rather than memorization of facts without application.
4/10/2016 20:35:30	Worland	**Recomm. as is**	I am in favor of the more specific nature regarding the new standard requirements. The added benefits of assessment boundaries and suggested tie-ins with other scholastic dispilines brings additional support for instructors looking to creating a holistically rounded curriculum.
4/11/2016 7:44:06	Bar Nunn	**Recomm. as is**	Though the time needed to meet all standards is not realistic at the current rate that the science classes are taught in our high school I feel that over time the course set up could be changed and the standards for our students raised. I would say that without four years of science in high school and science being taught in elementary schools it will be challenging to meet these standards. Teachers will need to be highly qualified to teach their subjects, which I believe is important in all fields and especially science.
4/13/2016 8:25:07	Buffalo, WY	**Recomm. as is**	Thank you for taking a stance on the State Science Standards. There is a myopic viewpoint of worry about the wording of climate change and Evolution in the NGSS and how our Wyoming economy can be affected. Knowledge of all aspects of what is currently shown with empirical evidence of commonly criticized and polarizing topics like climate change will empower a more rounded life long learner for our Wyoming students. Our educational goal is to create and grow student led learning with knowing all facts and sides without pre-conceived notions, and basing knowledge on fact, as opposed to perceived fears.
4/14/2016 10:19:07	Cheyenne, WY	**Recomm. as is**	Look good
4/16/2016 14:58:29	Casper	**Recomm. as is**	I think the standards look good as they are.
4/19/2016 10:35:30	Pinedale, WY	**Recomm. as is**	Recommend as is
4/19/2016 11:53:40	Worland	**Recomm. as is**	The standards are good.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
4/19/2016 13:06:51	Riverton	**Recomm. as is**	Let's get going! Adopt them, adapt them but get something on the plate!
4/19/2016 13:40:14	Wheatland	**Recomm. as is**	The 2016 proposed science standards appear to address "language" concerns relative to the initial Next Gen Science Standards. Science is a critical subject for our students to understand and to make intelligent interpretation of information and decisions. It is time to move beyond the inadequate current Wyoming standards.
4/19/2016 14:43:35	Jackson	**Recomm. as is**	I like the new standards are based on a research-based set of standards (NGSS). The format is exciting to me, as the standards show integration with other content areas and cross-curricular themes. This will help position science as a discipline that must be studied in context of other disciplines. The degree that these are specific with assessment guidance, clarification statements, and connections to STEM will be invaluable as districts, schools, and teachers work to align their instructional program to the new standards. I would be thrilled if the State Board of Education adopted these standards for Wyoming students.
4/19/2016 16:18:00	Wheatland	**Recomm. as is**	I like the way the standards are broken out per grade level and clearly outline what should be taught at each grade level.
4/19/2016 18:38:35	Lander	**Recomm. as is**	The standards are age appropriate and have ideas related to Wyoming. I hope the standards are implemented.
4/20/2016 11:32:17	Farson, WY	**Recomm. as is**	Standards cover the basic science knowledge needed for students to be scientifically literate people. I do appreciate the "Assessment does not include" areas. Any good science teacher can fulfill these standards.
4/21/2016 12:16:21	Douglas	**Recomm. as is**	.
4/22/2016 15:30:03	Lander	**Recomm. as is**	Adopting NGSS is a positive move forward in science education.
4/24/2016 19:29:49	Cody	**Recomm. as is**	The standards are well written and meet the needs of students, especially cross cutting concepts and the science/engineering practices embedded into the disciplinary concepts. These standards expect students to think like scientists and recognize that science is interwoven in all aspects of life.
4/26/2016 7:29:59	Thermopolis	**Recomm. as is**	I would like to see the State Board of Education recommend these standards as is.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
4/28/2016 16:20:38	Lander	**Recomm. as is**	I support Wyoming Science Standards that include climate science and human activity. I support the incorporation of the following sections that are important in helping students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 9:36:18	Lander	**Recomm. as is**	I believe it is imperative our children are introduced to concepts of human impact on climate throughout their education. To prepare our graduates to be both innovators in energy technology as well as competitive candidates in the work force Wyoming must offer a science education informed by the most current scientific information available. Additionally, we must teach our students critical thinking skills to help them analyze information objectively.
4/29/2016 10:30:56	Cody	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 10:42:41	Lander	**Recomm. as is**	I support these standards.
4/29/2016 10:56:22	Lander	**Recomm. as is**	I support these rigorous science standards for Wyoming. I especially support the way that topics related to biological evolution and human impacts on the environment are introduced through scientific evidence and discovery. I also support the ways these standards encourage students to make critical observations and come up with new solutions to problems, such as climate change.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
4/29/2016 11:08:20	Lander	**Recomm. as is**	Appreciate the thoughtful work put in to these guidelines. I am pleased with the standards that include topics regarding climate science and human activity. Specifically: Core Idea ESS3: Earth and Human Activity (page 160-164) and HS-ESS3-2 through HS-ESS3-6 (page 239-243). I especially like that the subject matter is taken seriously but without hysteria.
4/29/2016 11:32:06	Lander	**Recomm. as is**	Educating students about the real and proven science that climate change is real and happening is important for Wyoming students to learn. I am in favor of maintaining the wording in the standards that supports that.
4/29/2016 11:38:00	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
4/29/2016 20:11:13	Lander, Wyo.	**Recomm. as is**	Continuing down this organizational road is something I feel has a strong validity.
4/30/2016 10:38:33	Lander	**Recomm. as is**	I believe that these standards as presented are an improvement and a long-awaited updated. Each of the standards presented here are rigorous per grade level, challenging and set a good path for our kids' learning and knowledge of the sciences and world around us. Specifically, they properly include the "politically charged" issue of people's interactions and potential effect on climate. In the Earth and Human's Activity (ESS3) sections for all grade levels, I believe that the standards provide unbiased, yet important challenges for students to investigate and learn about this important topic. Omission of these topics would have been unacceptable for the times in which we live. As a whole, these standards present and set the course for scientific topics clearly, unbiased and rounded.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
4/30/2016 15:31:35	Lander	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/1/2016 6:17:43	Lander	**Recomm. as is**	"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/1/2016 16:10:09	Laramie	**Recomm. as is**	I appreciate the work evident in these standards and support their adoption. As a geologist working in the energy industry I am well aware of the challenges that adaptation to Climate Change presents to society and to Wyoming in particular, but believe that an open dialogue based in science will present our best path to resolving the issues it presents. Therefore I note in particular my support of topics pertaining to climate science and human activity, including K-ESS3-3, Earth and Human Activity, 4-ESS3-1, Earth and Human Activity, 5-ESS3-1, Earth and Human Activity, Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity, and High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (especially Human Impact on Earth Systems and Global Climate Change). While the public policy issues surrounding Climate Change are complex and controversial, the basic science is clear and it is important to me that my middle-school aged son and his peers learn these issues and become equipped to productively engage in the problem solving and public dialogue as our society seeks to adapt and respond to Climate Change.
5/2/2016 6:09:58	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100);
5/2/2016 8:49:15	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science and human impacts to the global ecosystem. I support sections that help students develop creative solutions to the problem of climate change. Specifically, I support the following sections: - K-ESS3-3, Earth and Human Activity (page 18); - 4-ESS3-1, Earth and Human Activity (page 82); - 5-ESS3-1, Earth and Human Activity (page 100); - Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. - High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are important.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/2/2016 9:38:46	Lander, WY	**Recomm. as is**	I strongly support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop awareness of and creative solutions to the problem of climate change: K-ESS3-3, Earth and Human Activity (page 18); 4-ESS3-1, Earth and Human Activity (page 82); 5-ESS3-1, Earth and Human Activity (page 100); Middle School Earth & Space Sciences, Core Idea ESS3 (Earth and Human Activity, page 160-164); High School Earth & Space Sciences, Earth and Human Activity (HS-ESS3-2 through HS-ESS3-6, page 239-243).
5/2/2016 15:28:07	Lander	**Recomm. as is**	I support science standards that include climate science and evidence of human impact.
5/3/2016 10:41:49	Douglas	**Recomm. as is**	The Wyoming Science Standards cover the benchmarks needed for students.
5/4/2016 15:55:16	Lander	**Recomm. as is**	I appreciate the committee identified and linked CC standards from other content areas that can be addressed. However, as with common core standards, there are just too many to teach. We want to go deep not be too broad.
5/5/2016 14:03:30	Worland	**Recomm. as is**	In reviewing these standards, it is obvious that significant time and effort has gone into this process. The "Steamboat" symbol has helped our district to share the uniqueness of these standards as they relate to Wyoming. Nicely done.
5/5/2016 15:02:28	Gillette	**Recomm. as is**	I believe the way the standards are now are a great outline for Science
5/5/2016 20:23:41	Lander	**Recomm. as is**	Recommend as is
5/6/2016 22:45:33	Gillette	**Recomm. as is**	In see these new standards as a slightly softer version of NGSS which I liked as well.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/7/2016 8:01:15	Laramie	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. It is essential that Wyoming students be taught the science behind climate change without it being watered down for political reasons. The science is well-established. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/7/2016 9:07:51	Lander	**Recomm. as is**	Thank you for the opportunity to comment on these standards. I am very supportive of Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/7/2016 9:55:48	Lander	**Recomm. as is**	I support Wyoming Science Standards that include topics regarding climate science. In particular, I support inclusion of material that introduces the potential connections between climate and human activity and fosters a spirit of inquiry and exploration. I especially support the topical discussions and instruction that help students develop creative solutions to the problem of climate change over time. These learning opportunities help prepare children for the real issues that will face them in their adult lives. I would not support changes to the current standards that would remove these opportunities for learning.
5/7/2016 20:03:33	Lander	**Recomm. as is**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/8/2016 17:49:17	Lander	**Recomm. as is**	So appreciative of the inclusion of climate science.
5/8/2016 21:11:12	lander	**Recomm. as is**	I very much support the standards that include topics about earth and human activity. I love sections that give students the opportunity to troubleshoot options for climate science. Here are the sections from your online document that I am referring to: 1. K-ESS3-3, Earth and Human Activity 2. 4-ESS3-1, Earth and Human Activity 3. 5-ESS3-1, Earth and Human Activity 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity. In particular, subsections (C): Human Impact on Earth Systems and (D) Global Climate Change are very important for kids to be learning about so they can make educated decisions as adults. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 are also very important for similar reasons. I appreciate that these standards are spread throughout K-12 and not only taught in one or two years.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/9/2016 10:58:09	Laramie	**Recomm. as is**	I support science standards that help us all recognize the reality of climate change and grapple thoughtfully with the human activities that contribute to it.
5/9/2016 12:36:10	Gillette	**Recomm. as is**	First I would like to say that I am glad Ana Houseal from UW was part of this committee. Since my district, Campbell County, has been working with her for the last 3 years on a STEM grant and I don't see anybody from my district represented at this state level. I know our district is far in implementing science instruction at a very high level and I am sad that we weren't represented when considering what is going to drive the whole state. After working with the NGSS through STEM the past 3 years I have become very familiar with both the NGSS and how they fit into our current state standards. From looking at what I teach currently and the integration of the NGSS through this draft I like what I see. It is easy to read, I like the clarifications, and I see all the parts to it that we have already been implementing and find necessary and valuable.
5/9/2016 14:54:54	Rawlins	**Recomm. as is**	I was particularly pleased to see that two controversial topics (that should not be controversial)...human impact on the environment on local and grand scales and natural selection as the key factor in species' adaptation and survival....were not soft pedaled. Indeed, the standards say in several areas that "empirical evidence" and "mathematical modeling" will be used to assess the evidence. Nice.
5/10/2016 7:38:40	Lander	**Recomm. as is**	I appreciate science standards that incorporate concepts, facts, theories that are based on scientific evidence, as these are. I support teaching Wyoming students about how human activities affect our world and specifically providing them with information that will enable them to help resolve the challenges they will face. Thank you for including facts about climate change, regardless of the political implications.
5/10/2016 7:43:10	Cheyenne	**Recomm. as is**	Adopt these science standards. Climate change is real. The boom and bust cycle of oil and gas production has once again proven this is not a sustainable model for Wyoming. Governor Mead, take the politics out of bringing cutting edge science to Wyoming's classroom and support the Next Generation Science Standards and the educators who worked so hard to align these standards with what should be taught in Wyoming's classrooms.
5/10/2016 8:18:03	Laramie	**Recomm. as is**	I support the science standards regarding climate change and human activity. Students need to be educated on the best science available, supported by the vast majority of climate scientists worldwide.

Timestamp	Town of Residence	I would like to see the State Board of Education	Online Comments - Recommend as is
5/10/2016 11:44:10	Lander	**Recomm. as is**	I was excited to see the integration of standards that challenge students to understand climate systems and how humans are impacting these systems. There are some great critical thinking pieces in there and opportunities for students to make connections between their own actions (and human actions in general) and creative problem-solving to address impacts. PLEASE keep climate change in the standards as this WILL be an important aspect of all of our lives as we move forward!!!
5/10/2016 14:09:57	Thayne, WY	**Recomm. as is**	I'm pleased to see that all levels of students are expected to engage in argument based on evidence and logic.
5/10/2016 16:50:33	Casper	**Recomm. as is**	These standards allow teachers and students to look into the various topics using a variety of sources and for each to draw their own conclusions.
5/10/2016 20:19:37	Powell	**Recomm. as is**	Need to focus on essentials for each grade and make them reasonable to teach before the kids take the state assessment in March
5/11/2016 11:45:56	Jackson	**Recomm. as is**	I am a high school science teacher and my perception is that these standards fairly comprehensively cover the content and skills that students need to both be scientifically aware citizens and to have the scientific background required to be successful in their post-secondary educational/vocational endeavors.
5/11/2016 17:08:59	Casper	**Recomm. as is**	My concern is not with the standards themselves, but with the impact of the new standards. First, these standards are very integrated and utilize many components of STEM educational practices. That is a wonderful thing, however I worry that many teachers, especially at the elementary level, do not have the STEM pedagogical skills to adequately teach these standards. Also, due to the limitations in the elementary classroom such as: time, materials, other program requirements, lack of integration, etc...I worry that our elementary students will receive inadequate instruction to be proficient at a level that encourages success in secondary education. Finally, these standards call for a huge shift in the way science is taught in many elementary schools. I, personally, believe that this is the best thing that could possibly happen in the classroom, but I also worry that there are not the resources to provide this type of quality instruction. Again, personally, I feel comfortable creating this type of instruction myself, but I do not have access to the materials that would be required to teach the standards. Overall, I teach at a school where very little of our subject matter is integrated, and I feel that I will lose even more ground with science if the teachers in my building do not see the importance of integrating these standards into other subjects, and if they do not have the skills to teach the standards at the level required to prepare students. I believe that these issues are probably already being addressed, but I felt that it was important to share them in some form with this team. Thank you for indulging my thoughts and perspectives.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
3/23/2016 8:25:07	Upton	**Sugg. minors edits**	After reviewing the 2016 proposed standards I am concerned with the movement of depth of knowledge required at the elementary levels. The movement of the content knowledge does not seem matched to cognitive development.
3/23/2016 13:17:15	Jackson	**Sugg. minors edits**	Overall, these are a really great set of standards. I like the connections to other content area standards. I wonder why any changes were made from the NTSS standards (climate change and evolution?). It is very helpful for our small state to be able to use the capacity of other larger states when adopting new standards. Making changes to the national standards impedes this work.
3/23/2016 13:31:47	Upton	**Sugg. minors edits**	Depth of knowledge has taken a huge jump in all grade levels. Some topics might be broken up between several grade levels to transition the students into higher levels of thinking. (example: PSE :Energy for Kindergarten and 4th grade)
3/25/2016 20:34:18	Laramie	**Sugg. minors edits**	"HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors" describe the process of natural selection, which is one process of evolution but it is not agreed upon that all evolution primarily results from this. Instead the statement would be correct if it referred to: "... the process of evolution by natural selection results from four factors"

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
3/29/2016 11:53:43	Casper	**Sugg. minors edits**	First, I commend this group for it's overall treatment of climate change and evolution in the standards--the two areas over which there was manufactured controversy in the NGSS that led to this effort. I especially commend the group for its treatment of evolution under MS-LS4-2 and HS-LS4-1 for evolution, of deep time in MS-ESS1-4, and climate change under MS-ESS3-5 and HS-ESS3-6. I do think in MS-LS-4-3 we need to restore embryological evidence for evolutionary relationships. While Haeckel's theory of recapitulation is no longer valid, embryology continues to be a critical source of evidence for evolutionary relationships. I also think that the Wyoming Science Standards struck any reference to the age of the earth at 4.6 billion years old was a mistake. My own son has had a science teacher who, because of their activist Christian Creationist viewpoint, refused to teach evolution altogether. If it wasn't for my teaching him at home, my son would have never been exposed to biological evolution in his K-12 educational career in NCSD #1 and I did register complaints with administrators and know first hand this teacher is still refusing to teach evolution and thus either never faced a plan of assistance or employee improvement plan or ignored any coaching that resulted from my parent complaints. Truly, that's an administrative and evaluation issue, but given the age of Neo-McCarthyism in which we live, administrators tend to practically shy away from ensuring these standards are taught in science--even when there is a parent complaint--because of the political danger in so doing. In our community, said principal would be subject to excoriation in the community and even organized attempts to get said principal fired. Teachers can and are targeted for challenges strategically by evangelicals in our community, and it's for that reason we need these standards to be incredibly explicit and clear so that teachers who actually teach science rather than refusing to teach it can fall back on the standards when challenged by parents and community members who've targeted the so-called evolutionist. Therefore, we must restore every reference to the age of the earth at 4.6 billion years and modify all middle and high school standards relating to biological evolution to express the need for every student to understand radiometric dating, the rule of original supposition, and stratigraphy. We need to be really clear because there will be teachers in our state who are challenged by parents and church groups who truly believe the planet is 7,000 years old or younger (so called young earth creationists) so must restore every reference to the 4.6 BYA age of the earth and go a step further in insisting students actually understand all of the different methods of radiometric dating as the core of the evidence for evolution is fossil evidence. Next, I feel HS-ESS3-6 focuses on greenhouse gasses as the exclusive basis of climate models which are incredibly sophisticated and complex in tracking dozens of variables (but doesn't include mention of the need to understand natural forcings as positive feedback loops). I think there needs to be some mention in this standard of the loss of polar ice and albedity (the so called albedo polar ice cap trigger; as ice caps melt, more solar radiation absorbed, causing more ice to melt) in climate models as well as the "methane trigger" or "methane feedback loop" whereby as the planet warms, more deep sea ocean frozen methane melts and more permafrost melts, producing more methane. Based upon our study of Lake El'gygytgyn, with a 3.6 mya continguous multiple sedimentary isotopic record, adjustments to models now predict what the more alarmist models predicted a decade and a half ago--land surface temperatures of 200 F by 2100, which means this is truly an extinction event. The methane trigger, triggered by anthropogenic greenhouse gasses, could threaten to end most life on planet earth, so it's integral to explicitly reference it here in climate models as two natural positive feedback loops triggered by human caused warming so students understand the complexity and sophistication of these models. Further, there should be some

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
4/19/2016 8:21:43	Casper	**Sugg. minors edits**	Thank you for all your hard work. I really appreciate the work that you put into the proposed standards. The cross-curricular connections between ELA, social studies, and math are very helpful and easy to find/read. 1. What type of resources will be available to classroom teachers to support the standards? Will the use of the resources be mandatory or optional? Where will the resources be stored? 2. What type of assessments will be required from NCSD#1? 3. Will teachers be responsible for creating assessments? 4. Will the Kindergarten standards will be with prompting and support like most ELA standards are? Will a clarification for these three standards be included? I think one is needed for each. 5. The Engineering, Technology, & Application standards are listed for K-2. How are those standards envisioned to be implemented over time? 6. Is the life cycle of an animal (ex: chick) still included?
4/19/2016 8:21:44	Casper	**Sugg. minors edits**	1. What type of resources will be available to classroom teachers to support these standards? Will the use of these resources be mandatory or optional. Would it be possible to store the resources at the depot if they are in the form of science kits so that teachers could check them out as they see fit? 2. What type of assessment will be required from the district? 3. Will teacher be responsible for creating formative assessments? 4. Will the science standards for Kindergarten be with prompting and support like literature and informational text standards are? 5. On the engineering,technology and applications standards that are listed for grades K-2 - how do you envision these standards be implemented over time? Will a clarification statement be included on the document as these standards seem broad and vague 6. I do appreciate the amount of work that was put into these standards to extend them across the curriculum. 7. Will our reporting tool (i.e. report card) be aligned to the science standards?

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
4/19/2016 8:21:44	Casper	**Sugg. minors edits**	1. What type of resources will be available to classroom teachers to support these standards? Will the use of these resources be mandatory or optional? 1b. Would it be possible to store the resources at the depot if they are in the form of science kits so that teachers could check them out as they see fit? 2. What type of assessment will be required from the district? 3. Will teachers be responsible for creating formative assessments? 4. Will the standards for kindergarten be with prompting and support like the literature and informational text standards are? 5. On the engineering, technology & application standards, they are listed for grades K-2. How do you envision these standards be implemented over time? Will a clarification statement be included on the document as these standards seem broad and vague? 6. I noticed that plants and animals are combined in the Earth's Systems standards. Is the life cycle of an animal still part of the standard? In the past we had life cycle of an animal in Kindergarten, life cycle of a plant in 1st and life cycle of an insect in 2nd. Trying to determine if that's still there or gone?? 7. I appreciate the cross-curricular work that has gone into this document. It is very thoughtful and intricate. I do like that we have standards in each of the science areas!
4/19/2016 8:22:42	Casper	**Sugg. minors edits**	1. What types of resources will be available for teaching? Will they be mandatory or optional? Will resources be stored at the science depot for check out? 2. What type of assessment will be required, if any? Will teachers be responsible for our own assessments? 3. Are standards for kindergarten be "with prompting and support" similar to many ELA standards? 4. How do you envision these standards to be implemented over time: Engineering, Technology and Applications of Science. Will each grade level be responsible for these standards? Will a clarification statement be included for these standards? These standards seem very broad and somewhat unclear. 5. Is the Life Cycle of an animal or plant included in these standards? 6. How will these standards be reported for report cards? Positives + 1. I can tell lots of thoughtful work went into this document. 2. The "How to Read This Document" is very helpful. 3. Cross-Curricular Connections are very helpful.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
4/20/2016 11:07:11	Douglas	**Sugg. minors edits**	I like the Wyoming specific tie in and spiraling of concepts through grade levels. The standards do not seem as rigorous as they should be at the specific grade levels.
4/20/2016 14:55:57	Gillette	**Sugg. minors edits**	I think that the kindergarten standard of constructing something to show it can block out sunlight is a little odd for kindergarten.
4/27/2016 12:10:44	Jackson	**Sugg. minors edits**	I feel we are moving in a great direction with the current science standards. I like the majority of the language of the standards, as well as the high-level thinking that will go in to mastering them. The layout of the document is well organized and the additional information provided for each standard is helpful. I would strongly suggest adjusting the language of the standards that deal with argument. It is fantastic to see that students will be writing and speaking around various arguments. However, as they are currently written, these are not arguments. Let's look at MS-PS2-4 as an example. The standard states, "Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects." As written, students really have nothing to argue. There is no choice in what to argue - they are simply to argue truth and fact. A true argument offers students choice - where students have to determine a claim and then prove their claim to be true. Right now, though the language of the standards is to "argue," students will simply write an explanation of why the statement is true. Here is a better explanation of argument (greater detail can be found in this link: http://relatingresearchtopractice.org/article/224) "An argument is a claim that justifies a belief using data and warrants. A substantial degree of tentativeness is associated with an argument, without which, there would not be any reason for the argument itself (p. 629). The questions that must be resolved through argument are about whether the proposed explanation accounts for all the known facts, and whether that explanation does it better than all the other possible explanations." A better way of constructing the current standards that involve argument are to keep them open-ended, so that students have to come to conclusions through the learning that takes place in the classroom.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
4/29/2016 13:37:20	Lander, WY	**Sugg. minors edits**	Wyoming Science Standards should include the peer-reviewed science on the topics of climate science and human activity. I have published a study about creative problem solving: I support these sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
4/29/2016 14:01:33	Lander	**Sugg. minors edits**	I write on behalf of myself and my wife Jill Calder. I am copying the following prepared statement after reviewing the guidelines. I agree with adding language encouraging awareness of the connection between human activity and the health of both local and global ecosystems. We support Wyoming science standards that include topics regarding climate science and human activity. We especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important Thank you for considering our input. Respectfully,

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
4/29/2016 14:20:14	Lander	**Sugg. minors edits**	I appreciate that topics relating to human-caused climate change are included in several sections of the content and performance standards, especially in the middle school and high school sections. In the 5th grade curriculum, I would like to see specific connections made between personal actions, such as energy conservation, recycling, or choosing to bike rather than drive, and environmental consequences including human-caused climate change. Thank you for your efforts in this process!!
4/29/2016 14:37:28	lander, wyoming	**Sugg. minors edits**	I support Wyoming Science Standards that include topics on the cause and effect of global warming. I specifically support the proposed sections k-ess3-3; 4-ess3-1 amd 5-ess3-1
5/1/2016 13:53:22	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/2/2016 5:45:31	Lander	**Sugg. minors edits**	I am glad to see that human caused climate change is addressed in Wyoming's new science standards. I believe that human caused climate change is a very serious challenge that our generation is passing onto future generations. I know that there will be objections to exposing our children to this information. However, I also believe that to dismiss the topic of climate change out of hand because you do not agree with the answer is neither science nor education. Whether your background is in industry, finance, health care, agriculture, recreation, education or service climate change is a part of your life and we need to work toward addressing it. We want to send our children out into this world with their eyes wide open, not shielded by blinders that will only hamper their progress. Thank you.
5/2/2016 6:51:13	Lander	**Sugg. minors edits**	As one of the biggest technical challenges facing us today and especially for future thinkers and doers, I would like to see a strong inclusion of climate change science. Regardless of the politics, knowledge is the key and thats why we have science to begin with.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/2/2016 8:35:04	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and the impact of human activity on our natural resources and the plants, animals and waters on which all life depends. I support science standards that help students develop creative solutions to the problem of climate change.
5/2/2016 9:19:58	Lander	**Sugg. minors edits**	"I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/2/2016 12:30:06	Laramie	**Sugg. minors edits**	Minor edit on p. 46 to add a closed parenthesis to the SEP box in the bullet point (perhaps after "media"). Minor edit on p. 162 to change the "HS" icon to a "MS" icon. In addition, I want to commend this group on developing Wyoming-specific science standards that have incorporated a strong emphasis on identifying problems and developing solutions to those problems. The active nature of many of these standards allows students to explore key concepts in the sciences rather than being lectured on those concepts. I also wholeheartedly support the inclusion of direct mention of the effects of human activity with respect to climate change (especially pages 164 and 242). These standards will do much to develop future generations of critical thinkers and problem-solvers who are not afraid to face challenges. We want students who understand the way the world works and are not limited in their knowledge base.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/4/2016 7:27:25	Lander	**Sugg. minors edits**	"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/9/2016 11:14:15	Lander	**Sugg. minors edits**	I find it problematic that there is such a separation in the standards from humans and the rest of the living world. I would like to see more "cross connections" made to our place in all of the science that is being learned and that we are not separate from the rest of the world. There was a statement that "animals take in food and plants make their food" to actually paraphrase it. More correctly, both animals and plants take in nutrients and modify them for their needs. These are just some of the examples of small changes that should be made. I like the idea of emphasis on "mistakes" and "failures" are all part of the scientific process, and should be learned from.
5/9/2016 11:40:05	Wilson, WY	**Sugg. minors edits**	I support science standards at a national and state level that include topics regarding climate science and human activity. It is too late to ignore this harsh reality and will only help the next generation of problem solvers to thoroughly understand the problem and it's (real) causes.
5/9/2016 13:36:15	Lander, WY	**Sugg. minors edits**	As a Wyoming parent, I am greatly concerned about efforts to undermine science education by removing or changing critical evidence-based educational standards related to human-caused climate change. Please do not let Wyoming science education fall below the rest of the nation and the world by removing or changing common core science standards related to anthropogenic global climate change.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/9/2016 15:01:38	Pinedale	**Sugg. minors edits**	Dear Wyoming Department of Education: I support teaching accurate, up-to-date climate science in Wyoming public schools. I support Wyoming science standards that include topics regarding climate science and human activity. Further, I recommend that the WDE revise the 2016 science standards to include the most recent, relevant data describing the link between global climate change and human activity. After all, today's students are tomorrow's stewards of the environment. Wyoming would be negligent to allow the next generation to inherit a planet they do not understand. How can you expect a person to respect the planet when they are not properly educated about it's most pressing threats? By now, Wyoming should recognize that climate change is NOT a political issue -- it is an economic issue, an environmental issue, but most of all -- it is an issue that requires immediate action! Wyoming students deserve to be kept informed and up-to-date of climate science. Do not let our students fall behind the rest of the nation because of ignorant political agendas! Thank you,
5/9/2016 15:06:09	Lander, WY	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/9/2016 15:09:28	Lander	**Sugg. minors edits**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); I suggest adding a bullet to the Science & Engineering Practices regarding: "Humans have altered the earth's climate. What can we do to limit our impact on climate change?" 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important. I suggest adding "oceanic life" to the bullet regarding "Global Climate Change" as follows: "Through computer simulations and other studies, important discoveries are still being made about how the ocean and oceanic life, the atmosphere, and the biosphere interact and are modified in response to human activities."
5/9/2016 16:34:43	Lander	**Sugg. minors edits**	I am glad to see these standard address the topic of climate change and human activity, but feel they could go even further in drawing a direct correlation between fossil fuels, greenhouse gasses, and climate change. This is probably a good start and the best one can expect given the current political climate. Thank you.
5/9/2016 16:36:34	Kelly	**Sugg. minors edits**	I feel that rather than the individual activities/projects that are recommended in the standards that the standard show address content and it be up to the teacher/school district to interpret this. For example, instead of defining an experiment about light and shadow; the standard should read that students will investigate light sources. Recommendations about possible activities/projects would be great, but by being as specific as the standard is makes it hard for teachers to be flexible.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/9/2016 21:23:20	Cody, WY	**Sugg. minors edits**	The only thing I am concerned about is just in the way these standards are taught as it relates to Climate Science or what is called Global Warming. I would want to make certain that teachers do not teach the theory of man caused global warming as a fact. Regardless of whether or not global warming is fact, I think the idea as to whether or not it is human caused, should be left out or at most taught as one of many theory's to explain climate change. It is popular in today's media for people to speak of man caused global warming as fact. These standards need to make clearer that man caused global warming is only one of several theory's to explain climate change cycles.
5/9/2016 21:44:49	Lander, WY	**Sugg. minors edits**	I support a strong science curriculum that includes the study of global climate change and the known impacts of human activity on our climate. The Earth and Human Activities sections, in particular pages 18, 82 and 100, and the Middle School Earth and Space Sciences Core idea ESS3 contain knowledge that I believe is critical for my two daughters, ages 12 and 10, to know and understand. We will do our children a grave disservice if we exclude factual, accepted science from their educational experience. This, in turn, does our planet a grave disservice, since this generation and the ones to come will be called upon to help solve the problems caused by climate change.
5/9/2016 21:54:57	Jackson	**Sugg. minors edits**	I would like to see up-to-date climate science in all levels of education, including discussion of the roles of humans in climate change , with the hope that our students can help find solutions to the problem of increasing global temperatures due to human activities.
5/10/2016 13:37:59	Lander	**Sugg. minors edits**	I support Wyoming science standards that include topics regarding climate science and human activity.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/10/2016 14:10:59	Laramie	**Sugg. minors edits**	I know that the proposed edits below were written by someone else and I copied them. But they represent my thoughts perfectly and express more eloquently than I could what needs to be changed to make the proposed standards acceptable. It does no good to keep information from students; it only makes them less prepard to go into the world armed with the ability to be critical and independent thinkers. I have full faith in the ability of our youth to sift through the information they are exposed to, and to come up with their own truth. It may not be the same as mine, but they have at least been given the opportunity to think for themselves and make their own choices. That is all I would hope for, because when they finish formal education, they will be making their own way and own choices. I just want them to have the requisite tools with which to always be inquisitive, to question, and to know how to make informed choices. The middle school Earth and Human Activity standard MS-ESS3-5 should be clarified by changing the wording to: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. The high school Earth and Human Activity Disciplinary Core Idea for standard HS-ESS3-5 is not aligned with the performance expectation. The core idea about the economically viable extraction of elements does not fit within a standard about analyzing data and results from global climate models. The core idea should be changed to language used in NGSS: Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts. Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.
5/10/2016 15:51:36	Moose	**Sugg. minors edits**	I support Wyoming science standards that include topics regarding climate science and human activity.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/10/2016 16:07:41	Cheyenne	**Sugg. minors edits**	Overall, the standards are very good and will form the basis of a strong science curriculum for LCSD#1. I hope they can be finalized and approved and referred to school districts, with professional development assistance, as soon as possible. I found one anomaly in HS-ESS3-5, page 242, which talks about the economics of the mineral extraction industry. I can see a useful exercise in economics or social studies about the cost/benefit of a commercial activity and why some people focus on short-term gain and ignore long-term cost, but I'm not sure it relates to this science standard.
5/10/2016 16:09:48	Jackson	**Sugg. minors edits**	The middle school standard MS-ESS3-5, Earth and Human Activity, should be better clarified by adjusting the wording in this way: Ask questions that will help to clarify the evidence of the factors that have caused the rise in global temperatures over the past century. In the high school standard HS-ESS3-5, the Earth and Human Activity Disciplinary Core Idea isn't aligned with the performance expectation. The economically viable extraction core idea does not fit within a standard about analyzing date and results from global climate models. The language used in NGSS is a better choice for this core idea — the language in HS-ESS3-5 should be changed to match the NGSS language in this regard, as follows: * Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts. * Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere and the biosphere interact and are modified in response to human activities.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/10/2016 16:19:48	Pavillion	**Sugg. minors edits**	I would like to see some minor edits to these science standards: The middle school Earth and Human Activity standard MS-ESS3-5 should be clarified by changing the wording to: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. The high school Earth and Human Activity Disciplinary Core idea for standard HS--ESS3-5 is not aligned with the performance expectation. The core idea about economically viable extraction of elements does not fit within a standard about analyzing data and results from global climate models. The core idea should be changed to language used in NG SS: --Though the magnitudes of human impacts are greater than they have ever been, so, too, are human abilities to model, predict, and manage current and future impacts. --Through computer simulation and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.
5/10/2016 19:44:11	Casper	**Sugg. minors edits**	My concern is that essential Physical Science topics are not included but need to be taught to properly assess the standards that are listed. After doing a search I found that science teachers all over the country agree that Kinematics and Newton's First and Third Laws should be included. The following statement is from Mrs. Bree Barnett Dreyfuss, who has done a lot of work with the standards and has posted content plans that integrate all parts of NGSS as they apply to Physics. "My problem with the specific Discipline Core Ideas (content) for Physics is that there are many traditional concepts not listed. For example, there is a Performance Expectation about Newton's Second Law but the other laws of [motion, and] basic Kinematics, like the differences between acceleration and velocity, are missing. I work with new teachers frequently and I am concerned that they will not think of all the other content that students will need to understand the Performance Expectations." Since Wyoming is writing our own standards based on NGSS, we have the opportunity to correct this omission and create a true "standard" that will serve both new and veteran teachers.

Timestamp	Town of Residence	I would like to see some minor edits to these science standards.	Online Comments - Minor Edits
5/11/2016 11:26:46	Afton	**Sugg. minors edits**	MS-LS-2-5 I'd like to change the wording of the crosscutting concept so as not to imply that small changes in an ecosystem will damage that ecosystem or cause large changes. I don't want my students to think that they can't (interact) with the nature they encounter in the backcountry for fear that it will be ruined indefinitely and thus not go out to explore, learn, and grow from such interactions. MS-LS-4-1 On the clarification statement about organisms becoming more complex over time "finding patterns of changes in the levels of complexity". I don't believe that there is enough evidence in the fossil record to show that anatomical structures have gotten more complex or that all living things have evolved out of a first few simple microorganisms. A few sparse examples in the fossil record just aren't enough for me. I won't present just one idea to my students and not give them some alternative theories on how living things have evolved or have come to be on the Earth. MS-LS-4-4 Core Idea: The wording in this statement implies that traits in the gene pool are being suppressed (still present) when in actuality they may be nonexistent. Saying "suppressed" implies that the genes are still there and in natural selection genes that are selected against are removed from the gene pool through death or non-reproduction. I'd rather it say that the traits or alleles have decreased in the gene pool and thus show up less often. I'm not sure if I missed it but I don't see any standards for taxonomy?

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
3/28/2016 9:00:56	Evanston	**Have major concerns**	The standards for K to 3 seem difficult for a young mind. How is the standards going to be taught? In addition, are these proposed standards being taught by someone qualified? In other words by someone who has been trained through their undergraduate program? Or is the curriculum just going to be added to the teacher's plate w/o proper training?
3/28/2016 9:28:33	Evanston	**Have major concerns**	It looks like everything regarding Climate Science has been removed. We may not like it, and oil and coal interests may not like it, but it doesn't neutralize the threat when we cover our eyes.
3/30/2016 8:37:54	Lovell	**Have major concerns**	I question whether or not these standards are appropriate for all high school students. The breadth and the depth of them is daunting. There may be some standards that are of less value in a general education. They seem to be more appropriate for students entering scientific fields in college or career after high school. As a high school physical sciences educator I feel like there are too many standards here with too much depth of knowledge to be viable expectations for the general science education of all Wyoming students. I also have some serious concerns about a high school earth science standard. HS-ESS3-4 - This standard should be revised in such a way that it does not take as given the idea that human impacts on natural systems are wrong or negative. It should be clarified that impacts on natural systems are negative inasmuch as they fail to promote human wellbeing but are not inherently negative.
4/11/2016 7:46:32	Casper	**Have major concerns**	1.) The time needed to meet all standards is not realistic due to the current structure of a traditional Wyoming High School. In order to meet all of the standards listed students would need to take the equivalent of 2 yrs of Earth/Space, 2 yrs Physical Sci/Physics, 2 yrs of Chemistry, and 2 yrs of Biology. There is NO way students can be expected to meet these standards in the current time frame. While most of the standards are addressing the need of more rigor, the timeline to get there is not feasible. We went through the Chemistry portions of the standards and most of those standards are not meet until Chemistry II, and/or Chemistry AP. I like the fact we have new standards coming our way, but am concerned about how to get students to meet all of them in the current system.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
4/11/2016 7:49:04	Casper	**Have major concerns**	- The timeline needed to meet all standards is not realistic. When only three science credits are required to attain a high school diploma, how are students going to meet the expectations for all standards without additional course work required. I think with these standards we will need to change our graduation requirements so the students will also have the opportunity to be exposed to all of the standards in a 4 year program. - Additionally, with one Chemistry course, we do not get to equilibrium, kinetics and upper level thermochemistry due to the time constraint. Students in Chemistry 2 or AP Chemistry and IB chemistry have the time to meet the science standards but students that do not take those classes do not currently get exposed to these topics. The time is limited in the first year of chemistry to develop the sense of stoichiometry.
4/11/2016 7:51:32	Evansville	**Have major concerns**	concerns: the time needed to meet all standards is not realistic due to how the "highly qualified" status of teachers currently sits. The expectation that "ALL students will be able to attain all standards during their high school career" is just not realistic either because of the choices of science classes offered (Physical and Life sciences during their 9th and 10th grade years are the only classes that are "mandatory"-then they have the option to branch out into Chemistry, Astronomy, Physics, Anatomy, Bio Tech...etc...). Due to the rigor expected and outlined in the standards as they read now, it's not realistic to expect ALL students to master each one if they only need 3 science classes to graduate.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
4/22/2016 7:54:34	Stow, Ohio	**Have major concerns**	The coverage of origins science (study of the origins of the universe, of life, and of life's diversity) is biased. In particular, unguided (naturalistic) biological evolution is the only theory presented for the development of life on earth. Scientific evidence inferring teleology (intentional design or purpose in nature) is omitted, and students/teachers are left with the impression that the universe and life can be fully explained by unguided materialistic causation. The following are specific standards for which modification should be considered: Age-appropriateness. Benchmarks MS-LS3-1, MS-LS4-1 and MS-LS4-2 involve descent from a common ancestry (biological evolution). This topic is age-inappropriate for middle school students, and coverage should be delayed until high school life science. MS-LS3-1. Revise to state that nearly all random DNA mutations are harmful or neutral; very few could be called "beneficial." The long-term consequence of accumulated random mutations is declining fitness of the organism – and eventual extinction. MS-LS4-1. The intent is to guide students towards acceptance of unguided common descent (macroevolution). The fossil record can be interpreted in terms of either common descent or common design. The statement that "natural laws operate today as in the past" wrongly excludes the possibility of teleological involvement in certain singular past events. MS-LS4-2. This Benchmark wrongly assumes that evolutionary relationships exist. Common descent (or macroevolution) is a hypothesis, not a proven fact. Anatomical similarities (homologies) can be explained by either comment descent or common design. Types of evolution. Benchmarks MS-LS4-4, MS-LS4-5 and MS-LS4-6 all involve adaptation (microevolution) rather than common descent (macroevolution). Micro- and macroevolution are fundamentally different, but the standards do not distinguish them. Microevolution (small-scale change within a species) is operational (present day) science for which observation and experimentation are appropriate methods for inquiry. Macroevolution (large-scale change involving new body parts and plans) is historical (origins) science, which must be studied by the method of multiple competing hypotheses. Explanations developed for microevolution do not necessarily apply to macroevolution. HS-LS1-6. Some factual errors need to be corrected. In the Benchmark and Clarification Statement, "hydrocarbons" should be replaced by "small organic compounds" or something similar. A "hydrocarbon" contains only carbon and hydrogen. In the DCI, sugars do not have "backbones" per se. Instead of "their hydrocarbon backbones" one could simply say "they." HS-LS4-1. The Benchmark is strongly biased towards common ancestry (macroevolution). Common ancestry may or may not be true; the possibility of teleological causation should also be considered. It is surprising that the writers leave "embryological development" in the Benchmark, since they eliminated a middle school Benchmark (MS-LS4-3) on this topic. Micro- and macroevolution. HS-LS4-1 should be labeled "macroevolution," and HS-LS4-2/5 should be labeled "microevolution."

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
4/27/2016 21:11:07	Jackson	**Have major concerns**	Wen I read over the standards for my grade levels (4th and 5th) as well as the vertical alignment, I see really specific benchmarks. That's not necessarily bad sometimes, but I feel like they are so specific in this case that students won't find the joy or beauty in the broader subject itself. Learning the basics with somewhat broad strokes at a lower elementary level allows for passion and interest and true inquiry to develop throughout the upper elementary grades. I would like to see a broader base of scientific understanding reflected at the lower levels that builds towards specificity at the higher levels.
4/29/2016 11:40:18	Lander	**Have major concerns**	"I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
4/30/2016 17:22:24	Lander	**Have major concerns**	1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important."
5/2/2016 14:52:03	Lyman	**Have major concerns**	I do not think, if we are going to adopt science standards, that we should adopt such broad ones. I think the time should be taken to have specific standards for each grade level. K-2 is a pretty big range. For example, the standard of using certain tools to block the sun (like an umbrella) is good for K, but not for the other two grades -- especially second. I think each grade needs specific things to teach. Like with reading and math, we should have a clear path to guide students towards successful science education in the next grade and eventually high school. There should be a scope and sequence to our science education. The nature of these standards, and how general they are, is a waste of time and lack effectiveness.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/2/2016 14:54:39	Lander	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/5/2016 21:38:34	Lander	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document "Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/9/2016 11:27:58	Laramie	**Have major concerns**	I only support Wyoming science standards that are intentional about teaching climate science and the relationship to human activity.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/9/2016 11:59:53	Cody	**Have major concerns**	I am on a satellite hookup and downloading the full PDF was not working. I did review the introductory documents and appreciate the statement of general objectives. On the other hand, I have been involved in some meetings and discussions about the science standards. I believe this continue to be issues. First, the impact of human activity on climate change must be openly and objectively explored. It is astonishing how out of step Wyoming is on this issue and our head-in-the-sand approach to it. Second, science starts with observation and experimentation and the development and testing of theses. It starts with the facts. Religion starts with a faith. Evolution is not a theory; it is science's best explanation for the development of life on earth. I was a headmaster of a private independent school in New England. I often wonder how much time (teacher and student), money, and resources schools spend teaching creationism or intelligent design. My own 12 years as a student in the Cody School System was science only, and I was well served by it as I went out in life. The formation of the planet and its development have been developed and revealed by geology. Religion's answers, perhaps comforting, have no basis in science. There is an vital place for faith and religion in our lives, but we cripple our students in the world marketplace of ideas and employment if we continue to pass off some tenets of faith as science. Thank you for your time and consideration.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/9/2016 13:30:06	Wapiti	**Have major concerns**	I found the proposed science standards quite interesting, both for what they do and do not do. In evaluating these comments, please be aware that I focused on the elementary school standards because I have kids of that age. Finally, note that I am a Certified Interpretive Guide and an accomplished interpreter of both natural and cultural history for adults and children. I understand that educators have developed a systematic way of writing these standards that is intended as a shared foundation for the teaching of science. And perhaps I don't see what's going on here, but just the organization of the standards strikes me as reductionist (mechanistic if you want another word). We are fortunate to live in a fabulous laboratory of both nature and history and I don't see that reflected back at me in the organization of these standards. Nor do I see it in how my kids are being taught. The standards do include many important fundamental bits and pieces. But I do not see how science as a method or an overall understanding of how the world works is going to emerge from these bits and pieces, nor do I see that as a goal anywhere in these standards. I fear that this reflects educators' response to recent Legislative actions. I worked in the public sector of much of my career and "get" that issue. But it is pointless to pretend that you are teaching science if you are not explicitly addressing climate change and how that is impacting life in Wyoming on so many different planes. I think the same is true of other issues, like say big game migration. I understand that the standards allow teachers some freedom and that some of these issues are going to come into some classrooms. But if we are going to attempt to have over all standards that are unique to Wyoming, let's teach the fundamentals using our resources and issues. I know a great deal of work went into this document, and I appreciate that, but it falls far short of the potential.
5/9/2016 14:23:45	Casper	**Have major concerns**	I find an almost complete lack of content regarding the carbon cycle (mentioned but without reference to man's participation in it), climate change theory, and renewable energy resources. I understand that these are fraught topics in Wyoming, but ignorance of them will help no-one. Even if people here ignore the evidence of climate change, both the reality of it and the perceptions of people elsewhere about it will profoundly affect Wyoming's economy and markets. Wyoming has huge potential for increased renewable energy production. Our students should be on top of that.
5/9/2016 14:42:49	Cody	**Have major concerns**	I support Wyoming science standards that include topics regarding climate science and human activity.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/9/2016 17:10:45	Jackson	**Have major concerns**	I want to see objective reporting of the best science in all area. In Wyoming I fear that some aspects of reporting on pollution, and climate change research is distorted. There's lots of resistance from special interests when, for example our atmospheric pollution mentions coal mines. An implication is that we have fish consumption advisories on our fishing regulations because of mercury levels which are elevated because of atmoshperic levels of mercury from power plants fueled by coal. Likewise, climate change data should be fairly reported and special interest funded research should be labeled as such, and best science characteristics, such as representative sampling of data sources and peer reviewed reports sh should be explained.
5/10/2016 6:27:27	Lander	**Have major concerns**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I believe that it is essential for Wyoming students to learn this information. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/10/2016 6:29:34	Wilson	**Have major concerns**	Please teach climate science starting in grade K and build on it each year through grade 12. Climate change will profoundly affect the large portion of Wyoming's economy that is rooted in coal, natural gas, and oil. It will drive the creation of more wind farms and solar fields. It will alter the array of plant and animal life throughout Wyoming, and its effects on Wyoming's second largest industry, tourism, will also be significant. Please teach students the basic physics of the phenomena, help them understand Wyoming's risks and opportunities, and include exposure to political, ecological, and economic factors at work as well. Climate change will be a major driving influence in Wyoming, so let's please be leaders in its scientific roots and its measurable consequences. Thank you.
5/10/2016 7:11:54	Cheyenne	**Have major concerns**	, "I support Wyoming science standards that include topics regarding climate science and human activity."

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/10/2016 9:32:37	Rock Springs	**Have major concerns**	I am a biologist with a PHd, and taught at the college level for several years. I am retired, but take ceramics classes at the local community college, where I interact with students that have just come through the k through 12 system. The major point that I would like to make is that the reasoning ability of students that complete high school in Wyoming is terrible. Deductive reasoning and the scientific method should be taught to all students, not just those in advanced scientific based courses. As a working scientist I can tell you that to most of us "Science" is far more about the approach to drawing conclusions than the body of knowledge that results from this approach. Secondly, I would argue that the section on climate change needs to be revised. Warming of the Earth's atmosphere from burning of fossil fuels is as well established as a concept like gravity. To suggest that there is legitimate disagreement over this fact is disingenuous, and reflects poorly on the reasoning ability of the education establishment of the state. There are economic reasons why the state should support some use of fossil fuels and I would argue that these arguments should be made. The credibility of these economic arguments is seriously undermined when you take the approach of questioning the human driven component of climate change.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/10/2016 10:29:27 PM	Story	**Have major concerns**	Wyoming's education system has recently rated high in many surveys, contests, or comparisons. Which established high expectations for these standards, however, I do not feel they meet the high caliber the people of Wyoming have come to expect. From speaking with professionals within our district (Sheridan #2), I understand the repetition of subjects within the grades is a technique called spiraling. I can understand that perspective and pedagogy. However, I feel more strongly that it lacks the breadth to cover a subject as varied and complex as science. By implementing this technique, too many fundamental aspects and areas of the sciences are being missed or altogether left out. For instance, weather is mentioned multiple times within the standards and throughout the grade levels. Although weather is complex and universal it seems a waste of precious time and resource to repeat when imperative subjects such as agriculture, basic chemistry, and many aspects of biology are not included at all. Agriculture nor wildlife biology do not warrant a single unit of study or assessment within these standards. I feel this is gross mistake, especially considering the state's reliance on agriculture science and industry (as well as the importance of our food system locally and globally) and the unique wildlife populations and environment Wyoming maintains. It also seems that there is a lack of laboratory and other hands-on learning associated with this curriculum. I understand that individual teaching methods and implementation is at the discretion of the teachers and/or districts, but most of the clarifying statements largely focus on discussion points. Research and teacher experience point out that students learn best when actively involved in a subject; often in the form of experiments, hands-on building and projects. If Wyoming is dedicated to have a top-tier education system, it must include projects, experiments, field work, laboratory time, and hands-on learning tools. It was also disconcerting that some of the information within these standards was either not complete, not inclusive or inaccurate. For instance, 5-LS1-1 (Molecules to Organisms. pg 94) states "Support an argument that plants get the materials they need for growth primarily from air and water" and the clarifying statement explains that water and air contribute more than soil to a plant. However, that statement excludes the invaluable contribution of the mycorrhizae, bacteria, insects, and fungi found in and on the soil. Also, within 4-ESS3-2 (Earth and Human Activity. pg 83) the boundary of the assessment is limited to earthquakes, floods, tsunamis, landslides, or volcanic eruptions. It would seem that if the curriculum was to make an impact on Wyoming students, the natural Earth processes (on humans) should include forest fires, tornadoes, avalanches, mudslides, etc. Any of these processes may be more relative to the students; or even better, encourage them to problem solve methods of dealing with these processes. I also have to trust that the media students are asked to use as sources have been either provided by the teacher or librarian or have been vetted. My trust must also be placed in teachers and administrators that even though boundaries have been established for the assessments, that is not where teaching or learning ends. The boundaries are limiting to the natural curiosities of students and the creative power of the teachers. I also hope that this process, the creation and approval of new standards, or at least others in the future, are put forth with honest and collaborative intentions. I have been told that our district has already adopted these standards. Since the timeline for public input has not passed, no taxpayer has been notified of the official adoption, nor results of the review have been published, I am, unfortunately, skeptical of those intentions. I also hope that the professionals working hard to produce quality standards and enable Wyoming students to continually achieve greater things, will revise these standards in such a way that will challenge students, offer a invitation to explore all the area of science, and most importantly, inspire curiosity.

Timestamp	Town of Residence	I think there are some major concerns with these science standards.	Online Comments - Major Concerns
5/10/2016 10:41:39 PM	Buffalo	**Have major concerns**	When high school science instructors were asked to give the scientific explanation of the genetic mechanism that allows the theory of evolution to be legitimate, for example where a "simple" organism (say with 1 chromosome, for example sake) "evolves" eventually over time, giving rise to a human (with 46 chromosomes) through the evolutionary tree, they were UNABLE TO GIVE THE GENETIC MECHANISM THAT WOULD ACCOUNT FOR THE ADDITION OF THIS GENETIC MATERIAL BECAUSE IT DOES NOT EXIST. Meiosis (and mitosis) are very exact and when even one base pair is affected, a disease state can take place, leaving the offspring less able to reproduce successfully, not better. No matter how much time goes by if it is the exact process of Meiosis you may get genetic variation but not loads of DNA from nowhere. Science teachers are put in awkward situations when they are asked to defend that which is not supported scientifically. Also there are no intermediate organisms for this "evolution" process of which there should be hundreds of thousands/millions if there are millions of different species with each species having millions of individuals. Fossils cannot be that hard to form since we find fossils of jellyfish. Using the Urey experiment whereby nonliving material is energized by say a lightning bolt to create carbon-containing compounds is just the opposite of logic as living things try to avoid the damaging effects of lightning, it being seen in science today as a destructive force, not a constructive force. This creates a jumble of nonsensical information and even if amino acids or nucleotides were formed that is nothing with the complexity of an organism, but simply art supplies. One needs the artist. In addition, Louis Pasteur already disproved nonliving material giving rise to living material in the 1800s (with his famous broth in swan necked flasks) which is the supposed basis for the whole start of evolution. By going backwards like this, by claiming that which was disproved already as being true and as the basis for the whole evolutionary theory to get started, it is an embarrassment to science. In fact, science textbooks document that in every case so far we find that life gives rise to life. We are to reject the null hypotheses (that nonlife can give rise to life) if in every case so far we find that life gives rise to life---biogenesis). We cannot pretend that maybe it was all different (subjective speculation) and that the laws were different in the beginning. Laws are laws and with the state of our education system is in, we are calling for Leadership in Truth to recognize that the theory of evolution lacks scientific evidence in its end, middle, and beginning. Let us be pioneers in announcing and teaching the exciting news that science has disproved abiogenesis (nonlife giving rise to life) and all evidence so far supports biogenesis (life giving rise to life) therefore supporting that a loving, living Creator has given rise to the amazing diversity of life on the planet, the study of which, we call science. For the sake of our state's educational system, let us humble ourselves and recognize the One who wrote the scientific laws instead of just focusing on who discovered the laws. Obedience to His truth results in blessing. We cannot expect to be in disobedience to His Truth and receive blessing, no more that a disobedient child would be rewarded by a loving parent. The loving parent would discipline, thus the present state of the budget of our educational system. Let us be brave in heart and pioneer the way to Truth for our nation just as we have pioneered in our past. Thank you for allowing this response and for your time to read it. Blessings from our Creator to you.

Timestamp	Town of Residence	Other Comment	Comments on Other
4/24/2016 10:37:38 AM	Casper	I tink the standards need to be simplified	I appreciate what is trying to be achieved with these standards. I would be more on board with applying these standards as is, IF students were ONLY tested in the third, fifth and eighth grades. Standards are helpful if presented in a simplified form and as guidelines for education. I liked the clarification statements, they provided a "real world" example for the benchmark. In the lower primary grades (K-2) students and teachers need more flexibility for instruction as each child develops at a different rate and should not be forced to try and learn something they are not developmentally ready for.
4/29/2016 10:20:06 AM	Lander, WY	**Other**	I support Wyoming Science Standards that include topics regarding climate science and human activity. I especially support the following sections that help students develop creative solutions to the problem of climate change (from the document “Proposed 2016 WY Science CPS - Public Input 03-21-16): 1. K-ESS3-3, Earth and Human Activity (page 18); 2. 4-ESS3-1, Earth and Human Activity (page 82); 3. 5-ESS3-1, Earth and Human Activity (page 100); 4. Middle School Earth & Space Sciences, Core Idea ESS3: Earth and Human Activity (page 160-164); In particular, subsections (C): Human Impact on Earth Systems (page 162-163) and (D) Global Climate Change (page 164) are very important. 5. High School Earth & Space Sciences, Earth and Human Activity, HS-ESS3-2 through HS-ESS3-6 (page 239-243) are very important.
5/9/2016 11:22:03 AM	Wilson	**Other**	We support teaching accurate, up-to-date climate science in our public schools
5/9/2016 6:33:34 PM	Wilson	**Other**	Support science standards including climate science and human activity.
5/9/2016 10:29:21 PM	Lander, WY	**Other**	Standards are acceptable as is, I support the continued requirements for standards that cover evidence for human influences on climate

Timestamp	Town of Residence	Other Comment	Comments on Other
5/10/2016 10:05:08 AM	Casper	**Other**	These are essentially the Next Generation Science Standards; to label them as otherwise ("Wyoming Content and Performance..") is disingenuous. These are the same in intent as the national NGSS which received a "C" grade from The Fordham Institute, which also graded Wyoming's previous standards at an "F". The WY/NGSS are highly political, both in the content and methodology. There are also numerous errors in fact, errors in concept, a lack of clarity (why are Clarification Statements needed?), severe restrictions on what will be assessed/teaching to the test (Assessment Boundaries), and an unfortunate dearth of foundational vocabulary and associated critical concepts. How can science be taught without the following, all of which are missing or rarely mentioned in these standards? Numbers following the selected words indicate how often the word appears in these standards. scientific method - 0; reproducible results – 0; hypothesis – 1; theory – 11 Jurassic - 0; Triassic - 0; Cretaceous - 0; igneous - 0; metamorphic - 0; lava – 0; magma – 0; melt – 7, 2 are wrong; fracture – 1; coal – 1 Page 239; drill – 0; sequestration – 0; Wegener – 0; Milankovitch cycle – 0; Hadley cell – 0; El Nino – 0; La Nina – 0; astronomy – 0; Galileo – 0; Copernicus – 0; Newton – 14; Einstein – 0; Hubble – 0; Doppler – 0 Page 226; Harlow Shapley – 0; None of the planets by name; Nothing about comets; eclipse – 1; umbra – 0; penumbra – 0; GPS – 0; global positioning satellite – 0; resolution – 0; optics - 0; ultraviolet - 0; infrared – 0; x-ray – 0; spectrum – 0; gamma – 1 Page 181; ph scale - 0; acid - relative to chemistry - 0, 5 in LS (amino); alkaline - 0; circuit - 1, Energy 4-PS3-4; Ohm - 0; voltage - 0; resistance - 0; Watt, watt - 0; electricity - 2; electric(al) circuit, 1 in 4-PS3-4; battery – 0; laser – 0; radar – 0; computer science – 0; program – 0; code – 0; Morse Code – 1; telegraph – 4; bit – 0; byte – 0; pixel – 2; memory – 3; ROM – 0; RAM – 0; 3-D printing – 0; Root cause analysis – 0; Simple machine - 0; axle - 0; wheel - 0; inclined plane - 0; lever – 0; fulcrum - 0; pulley - 0; screw - 0; wedge - 0; robot - 1 in K-2-ETSI Identify how science or technology affects production (e.g., assembly line, robots, and video streaming). taxonomy - 0; domain - relative to taxonomy - 0, other uses - 7; kingdom - 0; phylum - 0; class - relative to taxonomy - 0, other uses - 12; order - relative to taxonomy - 0, other uses - 60; family - relative to taxonomy - 0, other uses - 1; genus - 0; endothermic - 0; exothermic - 0; capillary - 0; cancer - 0; recessive - 0; dominant – 0; On Page 172, the following statement is made: "These standards and benchmarks include the most fundamental concepts of science, but are intended to leave room for expanded study in upper-level high school courses." This is not true. Just based on the short list provided above, many of the most fundamental concepts of science are NOT included. This also counters the Rationale statement: "The standards we present here provide the necessary foundation for local school district decisions about curriculum, assessments, and instruction. Implementation of the new standards will better prepare Wyoming high school graduates for the rigors of college and/or careers. In turn, Wyoming employers will be able to hire workers with a strong science and engineering base — both in specific content areas and in critical thinking and inquiry-based problem solving." These standards will not lead to Wyoming students having a "strong science and engineering base" nor will students emerge with "critical thinking skills and inquiry-based problem solving" - not when the "simple machines" are missing, there is no "scientific method" and chemistry and physics are barely covered. What are the political topics I object to? Again, I refer you to a vocabulary search: climate – 53; climate change – 13; severe weather – 8 total, 5 in K, 2 in MS, 1 in HS; solar (energy) – 8; human impacts – 15; model – 556; argument – 118; debate – 0 Look at HS-ESS2-4. "Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate." "Clarification Statement: Examples of the causes of climate change differ by timescale, over 1-10 years: large volcanic eruption, ocean circulation; 10-100s of years: changes in human activity, ocean circulation, solar output; 10-100s of thousands of years: changes to Earth's orbit and the orientation of its axis; and 10-100s of millions of years: long-term changes in atmospheric composition." With this statement, these standards are declaring that "changes in human activity" have an equal temporal and scale impact on the energy

Timestamp	Town of Residence	Other Comment	Comments on Other
5/10/2016	Kelly	letter emailed to Pete Gosar and the WDE	On behalf of over 800 Wyoming Climate Parents, I am writing to offer comments on the proposed Wyoming Science Content & Performance Standards. First, we applaud the efforts of the Science Standards Review Committee to produce a set of high quality science for Wyoming students. All parents want our kids to have access to the best science education available, and we are therefore most grateful for the dedication of committee members, Department of Education staff and Board members who have been involved in this long and thorough process. We have reviewed the draft standards, and would like to offer the following suggestions to strengthen standards pertaining to climate science: 1.The middle school Earth and Human Activity standard MS-ESS3-5 should be clarified by changing the wording to: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. The current draft standard asks students to understand the factors that have caused changes in global temperature over time. However, the disciplinary core idea correctly states that “human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth’s mean surface temperature.” Changing the benchmark from “change” in global temperatures over time to the rise in recent times would better align the benchmark with the disciplinary core idea, while helping to ensure that all students examine the evidence for what has caused – and will likely continue to cause -- rising temperatures during their lives. 2. The high school Earth and Human Activity Disciplinary Core Idea (DCI) for standard HS-ESS3-5 is not aligned with the performance expectation. The DCI states: "Most elements exist in Earth's crust at concentrations too low to be extracted, but in some locations where geological processes have concentrated them, extraction is economically viable." This statement has nothing to do with the performance expectation regarding analyzing data and results from global climate models. There is likely another place within the standards where this DCI would be more appropriate. Therefore, we suggest changing the DCI for HS-ESS3-5 to language used in NGSS: ☐ Though the magnitudes of human impacts are greater than they have ever been, so too are human abilities to model, predict, and manage current and future impacts. ☐ Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities. 3. The standard MS-ETS-2-2 includes this phrase within the performance expectation: “…..how the ethics and the integrity of scientists and engineers and respect for individual personal property rights might constrain future development.” This appears to be a highly subjective statement that, unlike the bulk of the other standards, does not ask students to evaluate evidence or data; rather, the statement invites students to potentially question the integrity, motivations or even imagined agendas of scientists and engineers. While this may be an interesting social studies question, we suggest eliminating or rewording this statement in the final science standards. Thank you very much for consideration of these comments, and for your commitment to science education for Wyoming students. Sincerely, Cate Cabot P.O. Box 85

Timestamp Wed, May 4, 2016	Name (First & Last)	Town of Residence	Email address or Phone #	Input Statement
Gillette Public Hearing	NO COMMENT COLLECTED			

		Town of Residence	Input Statement
Thurs, May 5, 2016 **Casper Public Hearing**	verbal (also given online comment)	Casper, Wyoming	I am a parent and teacher in Natrona County here in Casper. I have some comments I want to make as an individual but I did want to relay some comments, there was discussion within my professional association the Natrona County Education Association and I will say some of our elementary had some concerns and I did want to be here tonight to forward their concerns and that the paradigm shift and how science will be taught under these new they're a little concerned about the lack of resources and also creating the time those looking to have time be able to be given the opportunity to o be given as the emphasis on other academic skills. I just wanted to forward that first speaking for some of my colleagues, elementary science teachers.I will move onto some induvial comments and these are comments as an individual, as a parent, and as a teacher in the district, as a social studies teacher. I definitely think that literacy is critically important to citizenship and public policy, I first thing I suppose I wanted to say is that I commend the committee I for its hard work. I know I have done curriculum with the state standards and obviously I know there has been a lot of hard work that has gone into this. As I reviewed there standards there were a couple of things that I thought ought to be improved and some of the middle school, I believe it's the middle school that dealt with evolution of life and theory of the recapitulation has basically essentially been discredited but I do think embryological evidence is incredibly important to students understanding what I consider the unifying theory of all the biological sciences which is evolution and so I do think that ought to be added or reinserted. And then beyond that of course the other controversial area we talk about when talking about these standards has to do with climate science I don't have the reference of the standard in front of me but I do remember there is one that emphasize the role of the sun and solar radiation as the basis of climate and while that is utterly true and correct, my concern is that if you look at what has been happening with some of the individuals and organizations that have been working against better climate science education, they have really been I suppose emphasizing sun spotting and solar storms although the peer reviewed science actually has concluded and has been conclusive that at the end of the day it's not there so I just think it is important to put some sign of a cautionary note in that standard and also to expand at both natural and human forcing's and to be able to be more specific in that particular standard about that and I also think we need to include some language particularly relating to the two positive feedback loops that are dramatically contributing to the rise in global temperature on this planet albedity (the so called albedo polar ice cap trigger; as ice caps melt, more solar radiation absorbed, causing more ice to melt) in climate models as well as the "methane trigger" or "methane feedback loop" whereby as the planet warms, more deep sea ocean frozen methane melts and more permafrost melts, producing more methane. Based upon our study of Lake El'gygytgyn, with a 3.6 mya continguous multiple sedimentary isotopic record, adjustments to models now predict what the more alarmist models predicted a decade and a half ago--land surface temperatures of 200 F by 2100, which means this is truly an extinction event. The methane trigger, triggered by anthropogenic greenhouse gasses, could threaten to end most life on planet earth, so it's integral to explicitly reference it here in climate models as two natural. So with that said I think that is pretty much it, other than that I want to say that Wyoming graduates, last thing I'll say is markets are changing globally, one of the things that hurt Wyoming's coal industry is a drop in Chinese demand there are lots of causes for that but the reality is the global market is changing and it is really important that our students are well educated in science so that our future students can provide the solutions that only science in terms of engineering to these problems and I definitely think Wyoming graduates should not bear the stigma of being perhaps only one of the states of the country who develop standards in my view that are not scientifically supported. In West Virginia there was a strong push to dump NGGS and at the end of the day communities and parents had organized and they retracted some of the compromised standards regarding climate change. I think it will hurt Wyoming economically for us to adopt standards that comprise our best peer reviewed science.

		Town of Residence	Input Statement
Thurs, May 5, 2016 **Casper Public Hearing**	verbal (also given online comment)	Casper	In my opinion, I have looked at the k through 12 framework NRC. I have looked at the original 2013 NGSS, the Wyoming NGSS version. I don't see a tremendous difference between the original NGSS and what is being offered up here tonight. I am against this. I think it is not science education. It is largely a political indoctrination. I am very disappointed. There are a lot of good standards out there. That's why I asked Laurie about the other eleven states, and I think at a press conference, a Laramie board member asked why Massachusetts had not adopted NGSS. Because in my view, the Fordham Institute just gave an average grade C to the NGSS standards. In my analysis of all this, I wanted to share some thoughts, some discoveries. Vocabulary is absolutely critical to understanding science. It is a method to identify concepts to initiate understanding. I am going to go through vocabulary and read these very fast because I don't want to go overtime, so I hope you will bear with me.Climate-53 times Climate change 13 Severe weather 8, 5 in kindergarten Solar energy 8 HI 15Model 55 Argument 118 Debate-not mentioned Scientific method, reproducible results-not mentioned Hypothesis 1 Theory 2 Qualitative 36 Quantitative 29, thank goodness Jurassic, Triassic, cretaceous, igneous, metamorphic, lava, magma Not mentioned Melt 7, 2 of those wrongFracture 1 Oval 1 Drill not mentioned Sea crustacean not mentioned Vogner, malantavich cycle not mentioned Hadley cell not mentioned El nino, la nina, astronomy not mentioned Newton 14Galileo, Copernicus not mentioned Einsten, Hubbell, Doppler not mentioned Individual names of the 9 planets not mentioned Nothing about comets, eclipse, umbra Conumbra not mentionedGPS, resolutions, optics, ultra violet light, infrared rays, x rays, spectrum not mentionedGamma rays not mentioned H scale, ph scale, acid relative to chemistry not mentioned Alkaline not mentioned Electrical circuits 7 Electricy 2 Circuits 1, in 4th grade Huvolt resistance, watt, battery, radar, laser not mentioned Computer science program, code, Morse code 1 Telegraph 4Bit, byte not mentioned Pixel 2 Memory 3 ROM not mentioned RAW not mentioned 3d printing not mentioned On this topic of engineering, I don't know how it is going to be taught.Simple machine not mentioned Axel, level, fulcrum, pulley, screw, wedge not mentioned Robot 1 in K-12 ETSI Taxonomy not mentioned Domain relative to taxonomy not mentionedKingdom, phylum, class, order, family relative to taxonomy not mentioned Genus not mentionedExothermic and endothermic not mentioned Capillary, cancer, recessive and dominant not mentionedPage 172, HS, this "These standards and benchmarks include the most fundamental concepts of science, but are intended to leave room for expanded study in upper-level high school courses. The high school performance expectations allow high school students to explain more in-depth phenomena across the science disciplines, science and engineering practices and crosscutting concepts. but intended to leave room for upper level high school courses," I disagree. From the FAQ "Why new science standards? Why now? Science is central to the lives of all Americans. All students must have a solid K–12 science education that prepares them for life. The previous iteration of the science standards were ratified thirteen years ago. Major advances have taken place in the world of science and in our understanding of how students learn science effectively and the standards must be updated to reflect this."if this is supposed to be a current events inventory based on these read, the last statement of these Wyoming NGSS in my opinion are badly out of date.if this is supposed to be a current events inventory based on these read, the last statement of these Wyoming NGSS in my opinion are badly out of date.I have one item I would like to point out in the original NGSS. K-LS1-I K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. Animals need to take in food but plants do not is absolutely incorrect. The clarification statement, however, is contradictory to what the standard is all about to describe patterns. I would challenge for anyone to explain to kindergarten kids how plants make food. A much better way to introduce patters is that all plants and animals need to take in nutrients through various forms and that all living organisms on this planet, at least, need water.I find the clarification statement to be borderline, if not actually, curriculum. I am concerned if we have professional teachers who need these clarification statements which are present throughout the Wyoming NGSS document, they are not being properly trained. The assessment boundaries seem to be teaching only to the test. They seem to be quite limiting and unfortunate that is sort of a footnote of all of this were if higher education process is to take place there is room for that. The other thing I am very concerned about and would like to make note of is Pete Ellsworth was on the committee. Mr. Ellsworth penned or signed off as the provider of a letter to the Casper Star Tribune May 20, 2014, published and is now on the NSTA Website. Ellsworth, et al., offered up some very remarkable statements and I am concerned that a person would say anything like this as anything to do with the content and performance standards. [add quote 5/20/14] This method represents an obsolete view of the nature of science. Ellsworth, et al., statement seems to be in line of much of what education that the scientific method is no longer valid. Your own video which mentions the scientific method, which I pointed out in the vocabulary, that that phrase is not mentioned. What also showed up in the video with the man in the video who had cancer, I can't recall his name, the word cancer is not mentioned. I myself was diagnosed with cancer last year, and while I agree with his statement, and I am sorry I do not know his name, I would like our students to be exposed in all the life sciences to so much apparently what is not in there. One other thing from Ellsworth, et al., "The idea 'essential knowledge'." I don't know how somebody who is retired or otherwise can make that statement and be expected to be a credible source on this. I think there is a lot of problems with this. I think there is a lot of political background to all of this. But I think if all of

		Town of Residence	Input Statement
Thurs, May 5, 2016 **Casper Public Hearing**	verbal	Casper	As part of the SSRC, it was quite intense, quite demanding and quite contentious. Starting from our first work, which was exactly 365 days ago that our homework was given to us, and through webinars, four face-to-face meeting and one snowstorm, and lots of ways we were saying things, we would take each sentence and literally take each sentence and repeat over and over and over again just to see if the phrasing was right. Just to say if we really mean what we were saying. There was a lot of that. Lots of discussion. Having teachers be able to use Wyoming specific examples was important. We had a lot of teachers on the committee that had some concerns with what is going to happen when we give them to the districts. Are the districts going to be able to give us the time and resources that we are going to need to set these into motion. Lots of concerns about that. Literally, at each of our meeting, literally up to our last one, I do want to commend the WDE at putting all our scattered ideas together because, at the beginning, they were pretty scattered. We did have quite a few, I think Laurie said we had eleven. We looked at everything from Oklahoma to Michigan to Massachusetts and Callifornia. Those are the only three I can remember off the top of my head. We all had to write the pros and cons of them. As an individual who has just a cursory science background coming into these standards, I was amazed at the knowledge an intelligence and just the overwhelming feeling that everyone wanted these standard to be right. I think, no, I believe, we got these standards right

		Town of Residence	Input Statement
Fri, May 6, 2016 **Cheyenne Public Hearing**	verbal (also given online comment)	Cheyenne	I am an LCSD #1 Board Member - I want to congratulate the Department of Education for its recruitment of very qualified and diverse group of people to serve on the standards review committee. The work put into it to make these standards current and really serving the students of Wyoming and I would hope in the next 5 to 9 years the 2008 standards everyone agrees were woefully inadequate. I appreciate the effort to make them available thoroughly I hope the state board of education can approve them or make them any remedy if a flaw is pointed they can fixed for the districts, for the state of Wyoming. I understand some of the districts are already doing including the structure of the engineering standards. I am very hopeful that this will serve students.

Mon, May 9, 2016 Green River		Town of Residence	Input Statement
	written	Rock Springs	The science standards look great. The interdisciplanary lines are very helpful. I like the format and the "steamboaat" stamp-are very clear and understandable. Thank you for your thoughtful work.

		Town of Residence	Input Statement
Tues, May 10, 2016 **Powell Public Hearing**	verbal	Lovell	I've looked at the benchmarks. They are PS 19 E15 LS20 and with ETS 6 the benchmarks. We went from our Wyoming state standards with just I mean. We had to prioritize them just so we can get through them and I look at this and I am thinking we are getting away from whittling these down and we have to be responsible for so many more. That's my concern.
	verbal	Lovell	I have a lot of the same concerns. I teach 4th grade and with common core and all the reading standards the math standards, and then we get writing on top of that, and now it's science. And it's all being tested. And the number with not only that we don't have a rolling lab. We don't have all the equipment. Some of these go way deep into the sciences and I question where all this is coming from. All of this equipment. Where is it stored. And the prep time. With the numbers it's too much. I don't know how you can get it covered even if you push it into your reading. Even if you push it into your math. I understand you can push some of it into but not everything pushed into one project to cover that much. Thank you
Tues, May 10, 2016 **Powell Public Hearing**	verbal (also given online comment)	Lovell	I would like to mention a couple of things I like about the standards and are good. The first one I really like are the cross-curricular connections for science to the other content areas. We often get asked in the science field to support English arts and support mathematics to include writing and various reading components and I like the idea of sharing science as well. I think it is a good thought in vocational ed that we should be having the science. The engineering science standards as well. Those can show up there. So I think that is a good direction to go with the standards. I also really like the idea of the standards for early grade levels being clearly laid out and I do agree with I feel for the first grade teacher trying to figure out how they are going to do that on top of all the other things. That will not be easy and will require a lot of support a lot more thinking about the reality of the nuts and bolts of how that happens. I don't know how it will look but I think it is good. Some concerns I have. I do agree with the idea of rigor, increasing the science level and becoming more competitive. Looking at the high school standards as a high school teacher, I am concerned about the appropriateness of these standards for the general high school population. I feel like they are designed to prepare a student to be working in a scientific field or studying in a scientific field. They will do a good job with that but I am concerned about holding all Wyoming students accountable for that level of scientific expertise. Another concern that has already been shared is the number of standards. It's daunting to think about trying to accomplish that at a high school level. Each benchmark with all Wyoming high school students. My final concern is specifically with some of the language in a couple of the ESS and the one I feel there is some of the anti-human sentiment in some of the standards in the ESS section. An example is ESS 3-4. Certainly, we need to be aware of impacts on natural systems. What I think this standard is missing, what it needs to have, is the idea is that we really are concerned about protecting humans, and human well being and humans flourishing, and I don't think that's conveyed in a couple of the way the standards are worded and this standard in particular. Not that we I think it would be valued for a student to think about refining or developing technological solutions that reduce human impact but not with the idea that our most important job is to not have humans impact the environment. That should not be taught as a standard. It should be we need to protect the environment within the bigger concept of what makes human life better.

Tues, May 10, 2016 **Powell Public Hearing**	verbal (also given online comment)	Powell	To give you a little background, I served on the review committee before this one got together. I invested a lot of my personal interest, my time into reviewing the standards. The first go around when we looked at adopting the first NGSS as a whole and the process was basically the same. We went through basically just how the gals described it, face to face interviews, line by line, out by strands, elementary teachers, middle school and high school teachers. I just want to say to the elementary teachers that was something that was very apparent to them. There is a lot and there is a lot on your plates and really not a lot of time to fit science in. Some of the things that I like about the revisions of the standards I have seen is the different connections, the CTV, the health connections, ELA and math were there before. It is a lot and as a 6th grade science teacher, I just look at the physical science pieces and I look at that and say "oh my gosh, that's enormous." I do want to speak about the things that are positive. I think that will move Wyoming ahead up in our nation and global. The idea that the kids have to do something that they are constructing models, doing diagrams, thinking about a problem. So it is moving away from fact based and vocabulary. It's moving into doing something and I think it's something and I think it's something that will prepare our kids for the STEM careers they are going to be in. And, from hearing about high school kids a lot of times it's probably from kindergarten to high school is the motivation factor. What I see as a sixth grade science teacher is the kids are thirsty for the knowledge and when we get them doing things, when we can get them it can be the simplest of models. Things that don't take a lot of equipment. Things that get their feet wet. To get them thinking, to ask "what if," and that is really what I like about what I see is that sparks kids to do the "what ifs." It sparks them to ask the questions because that is what makes them scientists. That's what makes them better in their careers. That's what makes them college classroom and whatever they go from there. I do like they have the boundaries as far as the assessments. That was something that's missing in the 2008 standards. You don't know where your target is. When you are using our current 2008 standards, you don't know what the assessment writers are using. I like the boundaries and specifically stated and I think that is going to help us better prepare our kids. Hopefully we won't be looking at a bullseye that's enormous. We can narrow that down so we can focus on what kids need to know. I think that is a better direction. I am not saying they are perfect. I am not saying they are not overwhelming because I look at them and go "I don't know how I am going to do all that." But it sounds like we've got some time and it's going to be a process for all of us as I have seen the ELA standards come in and the new math standards come in, the Common Core push. There has been a lot of training in my district. I don't know about the Lovell district but I would hope and assume that there is going to be training as well for science because there needs to be. And if there isn't, we need to demand there is, because I think you would enjoy teaching the science lessons if you were trained properly to do it.
Timestamp Tues, May 10, 2016 **Powell Public Hearing**	written	Powell	School class days need to be designed to make sure that science and social studies are given ample insruction time for all students.. As a former Titl 1 teacher I saw teachers sending students to my room during science and social studies classes. Science is interesting and students like to participate. Can other subjects be incorporated into the reading and math to help with the time constraints of STEM?

Tues, May 10, 2016 **Powell Public Hearing**	written (then did verbal - below)	Lovell	I If the strands are K-5, 6-8, HS, then the assessments (state) should follow ans be tested in fifth grade, 8th grade and then whatever is appropriate at the HS leve. The appropriateness of theses standards is a concern in regards to all students- the level is high, the # and amount of satnadrds is huge are they appropriate for all students or better suited to those students interested in a science field (HS maybe more so). # , of benchmarks is unrealistic to coverin the time avaialbe to teach tehm. This would have to be taught by March each year to cover all by the time of the state test-so lucky to have 6-7 months to teach all the benchmarks. Evoution should not be taught as a standard but could be taught as a theory.State testing should e moved later(april or May) to give them time to teach all a standards.
	verbal		I think we all agree that standards are a good thing. I don't think anyone is saying they are not. I think they set that goal. What do we want students to learn? And I think they should be helping us set essentials. What is essential for kids at this level, at this level, at this level. That's why I would like to see sixth grade science standards not the strand necessarily. I think it pinpoints and more at this level. I think it would be a good thing and also that testing strand that we talked about a little bit. I am not quite sure why a K-5 is testing in 4th grade. That should be at the end of each strand. When you are testing at 4th, that's a concern. Talked about setting essentials. Our district does a lot with Marzano. That's a big huge thing, setting essentials. What's essential and narrowing it down. So, that seems in contrast to me with how big these are. It's good stuff. I don't disagree at all, hands on. Absolutely. Those kinds of experience for kids at every level. But, it is big and the research is showing that it's too much for kids. And it should be pared down. What's essential? We have been working in that with Common Core, in language arts and math. What is essential? How do we pare this down? These are pretty big. What do you leave out. What do you leave out? So in that regard, I think it is unrealistic how much you need to cover in a short amount of time. In a short amount of time, what do we leave out for the test? Because the test is in March. We lose April and May. We don't have those months for testing, I mean teaching, and this from the test after. We are cutting 6-7 months of teaching a grade level and that's not enough. That's pretty important to say teaching. Hey you know how much more I can teach them in two more months. If the test were later. I do think there is good stuff in what I read. I think we need to pick what is essential.

Recommended Changes to the K-1 ELA Extended Standards for Students with Significant Cognitive Disabilities

WYOMING
DEPARTMENT OF EDUCATION

Creating Opportunities for Students to Keep Wyoming Strong

Laurie Hernandez, M.Ed.
Standards Team Supervisor

Monica Mosier, M.Ed.
Standards Team
Language Arts (ELA) Consultant

PRESENTATION OVERVIEW

WYOMING
DEPARTMENT OF EDUCATION

- Brief Summary of Recommended Changes
- Public Input – Summary of Online Comments
- Non-Content Language Change

RECOMMENDED CHANGE EXAMPLE

WYOMING
DEPARTMENT OF EDUCATION

Rationale:

1. The phrase "with prompting and support" was removed or added to ensure that it is only part of the Essential Element (EE) if the phrase is a part of the corresponding 2012 ELA Wyoming Content and Performance Standard (WyCPS).

2. When appropriate, the Essential Element (EE) was revised so that it accurately reflects the most crucial part of the corresponding WyCPS.

RECOMMENDED CHANGE EXAMPLE

- **WyCPS: W.1.2** Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
- **Existing Extended Standard: EEW.1.2.** With prompting and support, select a topic and use drawing, dictating, or writing to share *how the story ended*.
- **Recommended Extended Standard: EEW.1.2.** Given a topic, write an informative/explanatory text that provides a few facts about the topic.

NUMBER OF CHANGES

WYOMING
DEPARTMENT OF EDUCATION

Explanation of Change	Approx. Number
"With prompting and support" was removed or added to match the language of the corresponding WyCPS.	55
When appropriate, the Essential Element was revised so that it accurately reflects the most crucial part of the corresponding Wyoming Content and Performance Standard (WyCPS).	55
When appropriate, the Instructional Achievement Level Descriptors were modified to ensure obvious scaffolding between levels and/or an accurate reflection of the corresponding WyCPS.	150

NUMBER OF CHANGES

WYOMING
DEPARTMENT OF EDUCATION

Explanation of Change	Approx. Number
The “not applicable” statement was rephrased to use more appropriate language. “The Extended Standards Educator Committee determined there are no relevant applications for this standard that are appropriate for students with significant cognitive disabilities.”	25
To solve version-control issues, “not applicable” was replaced with an appropriate Essential Element or an Essential Element was replaced with “not applicable.”	15

WYOMING
DEPARTMENT OF EDUCATION

Creating Opportunities for Students to Keep Wyoming Strong

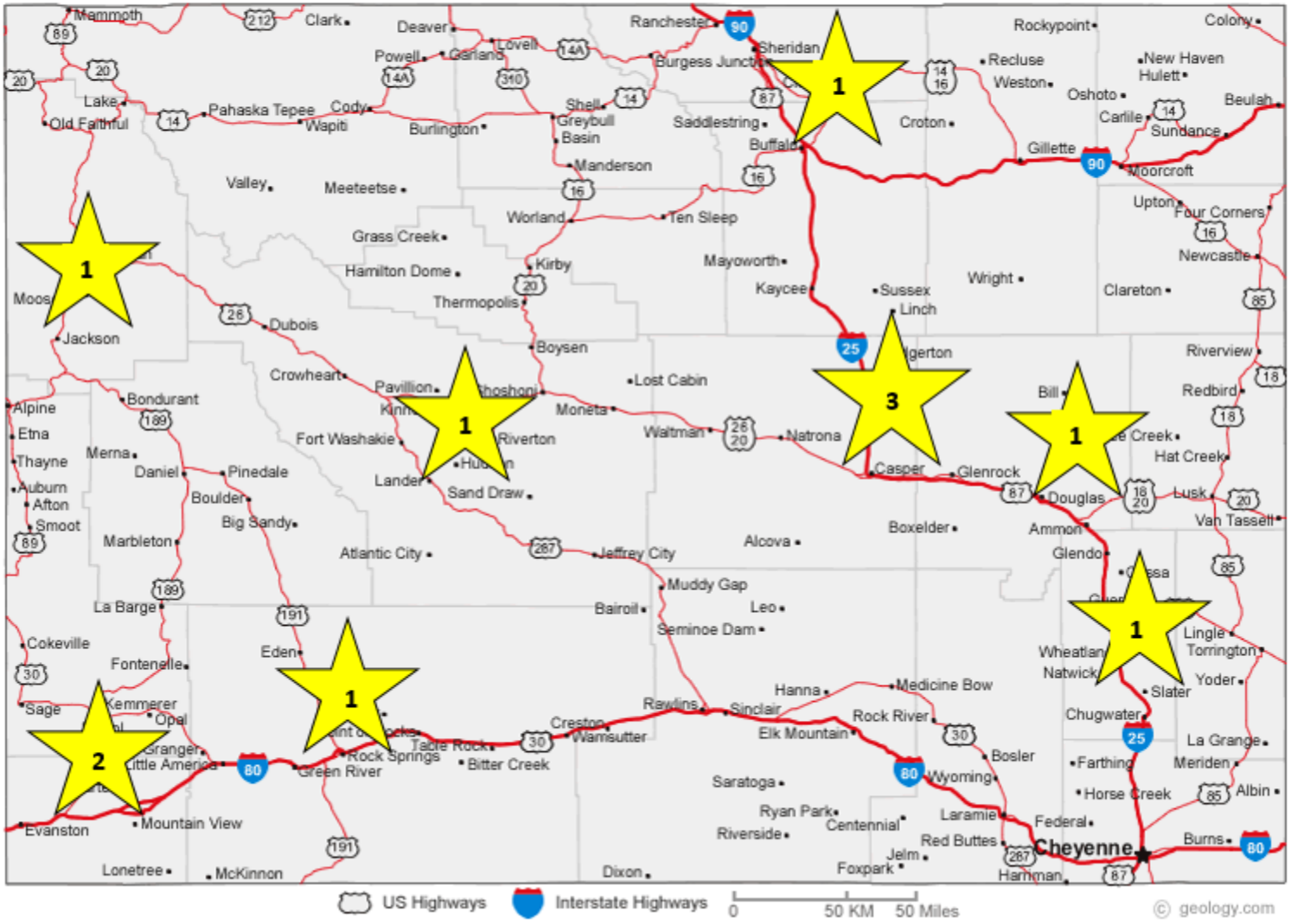
PUBLIC INPUT FROM ONLINE SURVEY AND PUBLIC HEARINGS

Public Input Received Online and at Public Hearings

Total	
Online	11
Verbal	0
Written	0

Date	Location	# of Verbal Comments	# of Written Comments
W. 5/4/16	Gillette	0	0
Th. 5/5/16	Casper	0	0
F. 5/6/16	Cheyenne	0	0
M. 5/9/16	Green River	0	0
T. 5/10/16	Powell	0	0
	TOTAL	**0**	**0**

PUBLIC INPUT on K-1 ELA Extended Standards
Collected Online – March 21 – May 10, 2016



Summary of Online Public Input
March 21 – May 10, 2016

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Public Input Responses	Want SBE to Adopt as is	Think Minor Edits May Be Needed	Think There are Major Concerns
# of Responses	8	1	2
Total # of Input	11	11	11

Comments for Support of Adoption

- "The proposed changes are more appropriate and realistic for students who take the PAWS-Alt assessments."
- "The changes recognize the cognitive abilities of a Kinder level student, as well as the use of the core standards to build K-12 goals."
- "The changes will make it easier and clearer for teachers to implement and measure."

Comments for Support of Adoption

- "…I think it is fair to say that this document will be a great resource for teachers to use when planning instruction for their students at ALL levels of ability."
- "The recommended changes closely align to the grades 2-5 standards and lays the foundation for those grades."
- "The changes are appropriate for the standards."

Comments for Minor Edits

- “RL.K.5. I think it's important that K-1 students identify COMMON types of text not just familiar as well as identifying the front and back covers and title pages of any book…Why are you "dumbing" this down? Teachers know and understand what this is saying. I feel like a lot of this was changed for the benefit of teachers and not necessarily what is best for students. I am frustrated by the simplification of some of these standards…Why are some of them deemed "Not applicable"?...Why just K-1?”

Comments for Major Concerns

- "…These standards seem too difficult for young children and do those who are going to teach them, know the subject matter through proper undergraduate training…"
- "At this age level, language arts standards are not necessary…Teachers are more than capable of guiding each child in their education without the added stress of trying to make sure that each child learns at the same pace…If standards are needed - give them as an overall guide…"

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QUESTIONS

NON-CONTENT LANGUAGE CHANGE

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- **EXISTING:** The Extended Standards Educator committee determined there are no real-world applications for this standard that are appropriate for this population and/or they have been covered in previous standards.

- **RECOMMENDED:** The Extended Standards Educator Committee determined there are no relevant applications for this standard that are appropriate for students with significant cognitive disabilities.

PROPOSAL

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For consistency, we recommend applying the non-content language change to the Math Extended Standards as well.

- **RECOMMENDED:** The Extended Standards Educator Committee determined there are no relevant applications for this standard that are appropriate for students with significant cognitive disabilities.

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Questions

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11	# of Comments from March 21 - May 10, 2016

DATE	LOCATION	# in Attendance	# of Verbal Comments	# of Written Comments	Legislators in Attendance	SBE Members in Attendance
W. 5/4/16	Gillette	0	0	0		Ken Rathbun
Th. 5/5/16	Casper	0	0	0		Walt Wilcox
F. 5/6/16	Cheyenne	0	0	0		
M. 5/9/16	Green River	0	0	0		
T. 5/10/16	Powell	0	0	0		

TOTAL Comments 11	11	0	0
	Online	Verbal	Written

Revised K-1 ELA Extended Standards - Input being presented to the SBE on May 19, 2016

Timestamp	Town of Residence	Commenter Chose the Following from the Selection	Comments on the Recommended Changes to the K-1 ELA Extended Standards
3/24/2016 18:33:55	Jackson	**Recomm. as is**	The proposed changes are more appropriate and realistic for students who take the PAWS-Alt assessments.
3/28/2016 9:05:56	Evanston	**Have major concerns**	Same comments as before. These standards seem too difficult for young children and do those who are going to teach them, know the subject matter through proper undergraduate training. Or, are they OJT in the presentation of this material?
3/28/2016 11:23:11	Evanston	**Sugg. minors edits**	RL.K.5. I think it's important that K-1 students identify COMMON types of text not just familiar as well as identifying the front and back covers and title pages of any book. RL.K.6 I also don't think it's unreasonable for students to identify the author and illustrator and describe the role of each. Let's give our students a chance to transfer their learning outside of what is familiar to them. Let's give them some credit and not simplify the standards too much so they aren't challenging. RF.K.1.d. Recognize and name all upper-case and lowercase letters of alphabet. Why would you take out "name"? RF.K.2.a. Recognize and produce rhyming words. Why would you take out "produce"? This is critical to their phonological awareness. RF.K.2.b. Count, pronounce, blend, and segment syllables in spoken words. Why only familiar? RF.K.3. Know and apply grade-level phonics and word analysis skills in decoding words. RF.K.3.a. Demonstrate basic knowledge of letter-sound correspondences by producing the primary or many of the most frequent sounds for each consonant. Why are you "dumbing" this down? Teachers know and understand what this is saying. I feel like a lot of this was changed for the benefit of teachers and not necessarily what is best for students. I am frustrated by the simplification of some of these standards in a way that seems to be "dumbing them down". Why are some of them deemed "Not applicable"? What is the general purpose of these changes? Why just K-1? Who made these initial proposed changes?

4/1/2016 7:26:32	riverton	**Recomm. as is**	The changes recognize the cognitive abilities of a Kinder level student, as well as the use of the core standards to build K-12 goals.
4/5/2016 15:31:23	Sheridan	**Recomm. as is**	The changes will make it easier and clearer for teachers to implement and measure.
4/5/2016 19:04:49	Douglad	**Recomm. as is**	The content is good as is.
4/8/2016 16:00:27	Casper	**Recomm. as is**	The group that completed this work spent an incredible amount of time making sure that the standards, the essential element and the level descriptors aligned and that they had rigor and showed growth between the grade levels. I think it is fair to say that this document will be a great resource for teachers to use when planning instruction for their students at ALL levels of ability.
4/19/2016 10:04:00	k Springs, Wyo	**Recomm. as is**	I like the samples to help determine how to get students working on expanded standards to the different levels.
4/19/2016 16:12:40	Wheatland	**Recomm. as is**	The recommended changes closely align to the grades 2-5 standards and lays the foundation for those grades.
4/20/2016 21:25:12	Casper	**Recomm. as is**	The changes are appropriate for the standards
4/24/2016 10:44:11	Casper	**Have major concerns**	At this age level, language arts standards are not necessary. Students should be allowed to learn at a rate appropriate for their individual development. Teachers are more than capable of guiding each child in their education without the added stress of trying to make sure that each child learns at the same pace. When students are allowed, at this age, the learn at their own pace, they enjoy learning and are less frustrated. Many students learn through leaps and bounds at this age rather than a steady incline as they do in later years. Giving standards in language arts in the K-2 setting is more of a hindrance than it is a help. If standards are needed - give them as an overall guide. For example - by the end of second grade the student will... and then allow the teachers to meet and work with each other to help achieve these goals. In short - eliminate the standards in language arts for K-1 entirely.

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WDE Response for SBE
These comments seem to stem from confusion of the purpose and also the format and structure of the various levels within the extended standards. For example, it is important for students to identify common types of texts (RL K.5), and this is stated in the general education standard. However, to make this standard accessible for students with significant cognitive disabilities, the focus is on familiar texts first (for a Level III student). For this standard, the Level IV student is aligned with the general education standard and is required to recognize common types of texts. Some of the standards were deemed "Not Applicable" by the original committee based on accessibility for students with significant cognitive disabilites. The study group checked the "not applicable" standards because of some version control issues and did find some standards labeled "not applicable" that could be accessed by students with significant cognitive disabilities. (i.e., RL.K.10 -- Actively engage in group reading activities with purpose and understanding). An essential element was created for this standard. The general purpose of the changes was to ensure that the extended standards align with the corresponding general content standard, have deliberate alignment and scaffolding throughout the entire document, and are clear and accessible for teachers and students. Changes were only made to the K-1 ELA standards because this was the only part of the document where the original standards review committe found errors and raised concerns. Some members of the original standards review committee made some initial proposed changes which led to the creation of a study group and the recommended changes.

Timestamp	Town of Residence	Commenter Chose the Following from the Selection	Comment on Major Concerns
3/28/2016 9:05:56	Evanston	**Have major concerns**	Same comments as before. These standards seem too difficult for young children and do those who are going to teach them, know the subject matter through proper undergraduate training. Or, are they OJT in the presentation of this material?
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WDE Response for SBE
Not relevant to the recommended changes and the work of the study group
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