

Arizona Science Standards Revision Working Group

Date and time of meeting: May 30, 2018 | 8:30 am – 3:30 pm

Scope of work: On May 30, 2018 a working group of diverse grade level content experts and community members continued the review of public comment received via the public survey after the May 17, 2018 meeting. These committee members reviewed the draft of the 2018 Science Standards and addressed public comment/feedback that had been received as of May 28, 2018 via the public survey, which closed at 12:00 p.m. (noon) on May 31st 2018.

For this meeting the working group committee reviewed public comment/feedback and

- Identified if the comment was actionable
- Identified what item the comment addressed
- Suggested changes if needed based on public feedback/working group discussion

Work completed: During the meeting the working group committee worked on grade level content (K-5) public feedback and the introduction section of the draft standards. The working group did not have enough time to address comments on topics of organization, depth-rigor, breadth, 2018 vs 2004 science standards, appendices of the 2018 draft science standards. Working group committee comments are compiled from May 17 - May 30, 2018 and this document begins with sections containing the introduction – high school grade levels.

Artifact: The document (artifact) is the actual working document from the science working group committee. As the working groups discussed the feedback/comment they determined and comment on the artifact:

- If the item was actionable by the committee (yes/no)
- What the item addressed (specific standard, key concepts, organization, etc.)
- Committee gave their suggestions of how to address the public comment/feedback

Plans for next meeting: The next working group meeting will continue to focus on public feedback received from the survey in grade levels 6-12 and other general portions of the document as time allows.



Survey Question	12. Please comment on the Introduction section.				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
56	The Introduction itself explains well the design and intended implementation, but on page 4, the Core Ideas, Life Science, LS section: evolution is a not a theory, (or a theory in the science discipline). unity and diversity of organisms IS a result of adaptation, which is a component of evolution.	Yes	Introduction pg 4		Big Idea 10 is the basis for L4 on Intro p 4 and frame work pp 139-168 - Core Idea LS4 pp. 164-168 but discussed in group the differences of chemical evolution, macro evolution and micro evolution.
61	Messy	No	comment		
69	N/A	No	comment		
80	nobody cares.	No	comment		
89	There IS one scientific method, and it works.	No	comment		Broad opinion based
114	no comment	No	comment		
123	I feel the first year might be different by after that all should be ok.	No	comment		
143	I believe that some of the wording that was added however is not accurate, as mention prior I have concerns with the paragraph at the bottom of page 2 which explains patterns, I strongly disagree with the statement that identifies the Science and Engineering Practices to the scientific method, if anything in our current document it is related to the Inquiry process not the scientific method. Science has changed even since I was in high school 25 years ago, the scientific method is a mode of communicating findings not the way that science is done.	Yes	Introduction pg 2-3	Remove "Formerly known as the scientific method.." statement from beginning of the Science and Engineering Practices pg. 3	The Science and Engineering Practices did not derive from the Scientific Method. The Scientific Method is procedure and the SEPs are critical components of scientific literacy.
145	Take all the green out. Non- experts clearly wrote the additional pieces and do not have an understanding of the science and engineering practices nor the crosscutting concepts.	Yes	comment		Public feedback is being reviewed
152	The terms cross-cutting and intertwining are confusing at best. This attempt to intermingle three levels of cognition regarding science is very confusing and to what end, at that. Why aren't that standards simply setting out the core concepts needed for functional literacy and practice in science? Rather than cross-cutting why not simply call them ways of looking at the world ?	Yes	comment	Possible rewording/word clarification (intertwined)	
154	Not being an educator, it was a bit confusing. But once I took the time to read carefully it was understandable, with some work on my part.	No	comment		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	comment		Statement doesn't address Introduction
163	Overall, the introduction provides enough information and context to understand the standards. I'm confused by the ADE changes that were made. The example for Patterns doesn't really capture the intent of that practice. I recommend that if an example is included, the ADE allow the working groups of educators to write a better example or to pull one from the Framework, as several examples are cited in that document. I am also confused about the statement about the scientific method, this indicates that there isn't a clear understanding of the practices (even the 2004 standards didn't refer to the scientific method) Please consult with high education faculty or research documents such as the Framework to better understand why the reference to the scientific method is misleading and inappropriate.	Yes	comment	Rewrite bottom paragraph on page 2 using pgs. 85-87 from the Framework to use examples from simple to complex patterns. See comment 143 about Scientific Method statement.	
165	It looks like it is subtly pushing anthropomorphic climate change. We do not have a significant effect on climate. Look for propaganda that serves political ends. The idea of anthropomorphic climate change is being used to push the destruction of prosperous countries, and capitalism as an engine of prosperity. One statement suggests that we have a significant impact on climate. We do not. The sun is the main driving force, and volcanoes have a significant effect. Carbon dioxide is not a culprit. It is necessary for the sustenance of life, and represents a tiny proportion of the atmosphere. It does not drive climate change.	Yes	Standard-core idea for knowing science E1- pa	Remove terms "natural and human" from E1 on page 4 in Core Ideas for Knowing Science.	E1 is Big Idea #5. It does not include natural and human in the document
172	I especially like the graphic used in the introduction. It is much better than the NGSS.	No	comment		
180	It is well written although shorten this section. Most teachers will skip over this section	No	comment		

181	It does not tell us how it will be implemented, it says it's up to the district.	No	comment		
184	It has a graph that is laid out nice and very easy to understand.	No	comment		
185	would like to see how the teachers are going to break it down to implement it into the classroom	No	comment		
186	If we keep these elements the introduction is good. But if we are making changes then the introduction needs to change.	No	comment		
187	Seems like it explains the expectations clearly.	No	comment		
188	If you keep this document the same, then the intro fits well.	No	comment		
189	It a lot of words it would be nice to simplify the facts.	No	comment		
190	It shows vertical articulation.	No	comment		
191	Fairly lengthy, but thorough.	No	comment		
193	While I appreciate the summary, it seems to be a lot of information.	No	comment		
195	The introduction focuses around the core ideas. The Science and Engineering Practices are much more rigorous than the Scientific Method and promote creative problem solving.	No	comment		
196	it focuses around the core ideas. the science and engineering aspect are much more vigorous than the scientific method.	No	comment		
197	Way to wordy.	No	comment		
208	Too complicated!!	No	comment		
219	The problem part is how they should be implemented because there is no building on different standards.	No	comment		3Dimensional approach
220	The introduction section lists the three dimensions and provides examples along with the goals of the new standards.	No	comment		
225	It is clear.	No	comment		
226	That all grade levels need to be doing science about 60 minutes a day.	No	comment		
227	The introduction is easy to understand.	No	comment		
228	Fine.	No	comment		
235	Our group felt that there was sufficient information in the introduction section.	No	comment		
243	The introduction section seems comprehensive and good.	No	comment		
250	Should offer a greater clarification of the about the core ideas.	No	comment		
257	It was familiar enough but more specifics will be useful.	No	comment		
265	IntroductionPage 2In the first sentence, remove 'between science disciplines' - this contradicts the next sentence, which is the correct interpretation of crosscutting concepts - it is not only within Science - but also between other disciplines.Page 3, 9, 21, 33, Appendix 2Remove 'Formerly known as the scientific method' â†’ this simply is not the case.Page 5Under the heading, 'The standards are neither curriculum nor instructional practices' the statement 'Therefore, identifying the sequence of instruction at each grade - what will be taught and for how long - requires concerted effort and attention at the local level.' must be heeded by the State Board of Education and Arizona Department of Education. The local school district's will not have the time that is needed with the final standards to do the work that is described in this sentence. We need to begin teaching 3rd, 6th, and 9th grade students using the new standards in August 2018. We won't have the final standards in our hands to identify 'the sequence of instruction at each grade' with enough time to give the task our 'concerted effort and attention'. This is not what we should be doing for our students. We will not be able to teach these standards with fidelity on the current timeline for these standards and the assessments that will accompany them.	Yes	Introduction and Appendix	Remove "science discipline" on page 2. Refer to comment 143 about Scientific Method. Extend transition/implementation timeline with assessment in 2021-2022.	There is a concern by commentor that the delay of standard approval will affect the sequence of instruction and assessment.
267	Awesome except the poorly written example of patterns.	No	comment		See comment 163
275	On page 2 it states that tectonic processes follow a pattern. If this were true, why can't we predict an earthquake or tsunami? INACCURATE!	Yes	Introduction	See comment 163	Validity to commentor's statement
276	Page 2 refers to predicting patterns of tectonic movement. While plates have predictable movement we cannot predict outcomes of their movement.	Yes	Introduction	See comment 163	Validity to commentor's statement
277	Although, much of the green verbiage needs to be revised or removed.	No	comment		
279	This portion looks fine to me.	No	comment		

284	You now have material that used to be in 1st grade (human body) in third grade. If they can handle it in an earlier grade they should. Also there is repetition in things such as plants, which could be repeated learning or each grade level assuming the other person is teaching it.	Yes	Introduction	For K-2/3-5 groups	Not part of the Introduction.
291	In the Core Ideas for knowing science could L4 read something like L4: The theory of evolution seeks to make clear the continuity, unity, and diversity of living and extinct organisms ? This will then encompass that evolution is a continual process that takes time but connects all species?Core Idea U3 for using science makes science seem very commercial.	Yes	Introduction	See comment 56	
292	No comment.	No	comment		
300	remove information about scientific method and paragraphs about patterns. Neither are correct or make sense.	Yes	Introduction	See comment 163 and 143	
305	The introduction does not provide any details on how this is to be implemented. It lists the basic ideas covered in each grade level.	No	Instruction		
311	These are not what the committee created	No	comment		
313	Though the time expectation only addresses the number of minutes per week the standards should be taught and misses the more important number of weeks required to teach the specified information.	No	Instruction		
320	The introduction needs to include vocabulary for each standard Sub-Category (ex: Physical Science, Earth and Space), as well as explicit expectations for what expected of the student in each standard.	No	Introduction	Each Core Idea is explained and embedded in the standard is the content- including key words	Key words
326	The introduction gave enough information to be able to understand the layout when I went to my grade level.	No	comment		
328	Throughout the document, the science and engineering practices are explained as being 'formerly known as the scientific method,' which is misleading. While the part of the old standards that most closely resembles the practices was the scientific method, they are not the same thing. The 'scientific method' is a linear procedure devised by well-meaning teachers and does not resemble in any real way what scientists actually do. The 'Science and Engineering Practices' are intended to be a comprehensive, non-linear outline of all of the roles and tasks a scientist must do. Without explanation of this key difference, there is a danger of teachers continuing to teach the 'scientific method,' which is contrary to the intent of the standards.	Yes	See comment 143		
335	It was very clear.	No	comment		
341	Not enough information to help suggest how or what steps build to teach the larger pictures.	No	comment		
347	This question seems misplaced/should be at the beginning.	No	comment		
351	As a new teacher, I'd prefer it to be more explicit in terms of what the standards are saying.	no	comment		
352	Introduction is fine.	No	comment		
354	Cross-curricular implementation and possibilities should be emphasized in each content introduction if they will remain grouped by discipline area. Many of the essential standards can be taught in all discipline areas and shouldn't be limited to one specific content area. Additionally, Appendix 3 should be acknowledged or present here to make the big idea/main end goal clear to all what students will be assessed on.	No	comment		Comment lacks clarity.
355	Necessary to understand the coding, scope and sequence. It is very clearly explained.	No	comment		
356	The introduction provides a nice overview for all grade levels. Also giving an overview of Crosscutting Concepts, Science and Engineering Practices, and Core Ideas for K-12.	NO	comment		
358	although there is enough information and context to help me understand how the standards are designed, it is hard to follow and additional graphics, such as tables, would help the organization and clarity of the introduction	No	comment		graphic table if what?

360	The introduction is very informative and provides background information that is helpful.	No	comment		
362	Gave a brief description of what is expected throughout the 3 dimensions of scientific learning.	No	commwnr		
365	The introduction section gives a thorough description of the big ideas that are the basis for the new standards.	No	comment		
366	Like that the science and engineering inquiry process is integrated into a more cohesive well rounded process instead of being linear. Like that the introduction clearly explains both the practices and sources of the core ideas.	No	comment		
367	I Like that the science and engineering inquiry process is integrated into a more cohesive process instead of being linear. Like that the introduction clearly explains both the practices and sources of the core ideas.	No	comment		
369	Quick overview. Nice to remind teachers of its structure. Not sure it is enough for teachers not familiar with the K-12 Framework.	No	comment		
378	Three dimensional teaching is the best, research way to go. The Framework for K-12 Science Education and the Working with the Big Ideas of Science Education was a smart decision. On page 2 however where there is information in green the introduction becomes muddy as there are incorrect science examples used. The statement In Earth and space sciences, tectonic processes follow a pattern is false. If it were true we would never be surprised by an earthquake. In science tectonic plate movement is taught not a tectonic PROCESS. The Science and Engineering practices were never the scientific method and even our 2004 standards don't allude to one way of doing science which is what the antiquated scientific method does. L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. Should say The diversity of organisms, living and extinct, is the result of evolution. Based on the documents in which the committee use to write the standards, Working with Big Ideas of Science Education, rewriting this statement makes it unclear and confusing.	Yes	Intro		see comments 163, 143, 56
380	Nature of Science is not included in the front matter. Would like to see a comment of reference to the appendix for explanations of what is included in each practice. Some may not have a clickable document when they are reviewing or making decisions about curriculum. On page 4, Each standard is written at the intersection of two core ideas, I would like to see that it is at the intersection of three dimensions and reference the crosscutting concepts too.	Yes	organization		all explanations are in Appendix and just have to turn pages to the back. The Core Ideas is one of the 3 dimensions and intersects with the other two. Referenced crosscutting concepts and standards will be addressed in the concept box.
386	Formerly known as the scientific method? What is with this wording?	No	comment		
387	The need for examples of crosscutting concepts should be moved to the Appendix.	yes	comment	see comment 163	
389	The Introduction makes sense, however there is no consistency within the breadth of the standards that reflects the NGSS principles.	no	comment		use Big Ideas and Framework
416	images are useful	no	comment		
430	It is even a bit long.	no	comment		
435	Add some more detail about how to age appropriately interpret standards.	no	comment		
451	Wording is a bit confusing	no	comment		
466	Do not understand the introductory explanation.	no	comment		
472	More specific information and guidance should be given to help schools navigate how the transition into the new standards from grade to grade should be executed. There seems to be a great deal more spiraling throughout grade levels, which is an excellent strategy. However, we need specific guidance on how to transition effectively so that students are not experiencing gaps. This also means that teachers need to be held accountable for teaching science in elementary grades, and not merely through the use of informational/expository text. Students must experience science through inquiry.	no	instruction and curriculum resources		
492	The introduction was understandable after a brief scan.	no	comment		
497	The background of the standards made sense.	no	comment		

512	This is clear and communicates the ideas behind the cross cutting concepts, core ideas, science and engineering practices as well as the intention of the standards to not be the curriculum or instruction....MINUS the key concepts that were added during the internal review.	no	comment		
516	The time allocation is not fully reasonable in most classroom days-- Science and Social Studies need to be alternated or the 45 minute block needs to be split between them.	no	comment		
527	It's written clearly.	no	comment		
530	I can understand it but I was on the committee and was specifically educated on the graphic and the rationale.	no	comment		
550	Perfect	no	comment		
551	Lengthy.	no	comment		
1001	Na	no	comment		
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	comment		see comment 56
1017	The referenced to evolution must be reinstated.	no	comment		
1020	1. Page 1, introduction, 2nd para, 1st sentence, last two words (and various places throughout text) - material world is a better descriptor, includes human created phenomenon not typically found in the natural world. 2. Page 3, 1st para, 1st sentence (and various places throughout the text) - 'Suggest deleting Formerly known as the scientific method, What is described in this section as science and engineering practices is a much broader process than the scientific method which is more narrowly limited to the observation and description of phenomena; use of hypotheses to explain phenomena, make predictions and quantify new observations; and use of properly performed and independent experimental tests of the predictions. This practices within the scientific method are not replaced by the described science and engineering practices, but rather are an essential methodology utilized within that process. 3. Page 4 Table Core Ideas for Knowing Science P4 (and various places throughout the text) - As written this core idea does not well reflect what is given as one of the big ideas of science education â€œ that the total amount of energy in the Universe remains the same and that energy can neither be created or destroyed. Suggest deleting the added phrase 'in a closed system' or changing it to 'in the Universe.' 4. Page 4 Table Core Ideas for Knowing Science L4 (and various places throughout the text) - The suggested rewording in 1.4 changes the meaning of the statement and should be removed. The original statement succinctly communicated that evolution is responsible for organism unity and diversity. This is current accepted scientific theory. It is an important organizing concept in scientific research and our understanding of the natural world. As such it is appropriate to include in life science standards. The revised language in 1.4 misconstrues what the theory of evolution is as well uses the word 'theory' in a way that is inconsistent with established scientific meaning. 5. Page 4 Table Core Ideas for Using Science U1 (and various places throughout the text) - It is generally understood that the purpose of science is to explain phenomena and (sometimes) predict not necessarily to always find the cause	yes	Comment	#1 - keep as is and refer to Big Idea. #2 - see comment 143 3. Remove the phrase "in a closed system" 4. See comment 56 5. Remove the word "purpose" from U1 or ideas pg 4. Remove the words both "positive and negative" from U4 pg 4	
1025	This section: One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns. In physical sciences, atomic structure is a pattern. In earth and space sciences, tectonic processes follow a pattern. Using graphs, charts, maps, and statistics in combination with the science and engineering practices, students can use their knowledge of patterns to formulate investigations, answer questions, and make informed predictions about observed phenomena. Is muddled and meaningless. What is a teacher supposed to do with that? atomic structure is a pattern is not something any physicist has said ever. Does the author think this is an episode of Numb3rs?	No	Comment		See comment 163
1030	too confusing	No	Comment		

1032	It provides enough information if one comes with a lot of background knowledge. I hope ADE provides training.	No	Comment		
1034	It needs to show how propaganda has seeped into the standards.	No	Comment		
1048	It is sufficient.	No	Comment		
1050	<p>1. Page 2. I do like the addition of the discussion of patterns as a crosscutting concept.</p> <p>2. Page 3. The addition of 'Formally known as the scientific method' detracts from the significance of 'science and engineering practices.' As a scientist and science educator, the use of the term scientific method implied that science was like a recipe, going step by step. This is far from how real science is done.</p> <p>3. One thing that I failed to have incorporated into the original draft of the Science Standards (I was on the Standards Committee as well as the NGSS review). In the 40 or so years that I have been a practicing scientist, I never asked a question or defined a problem without first making an observation. In the Framework and NGSS they go so far to use the example of asking the question 'Why is the sky blue?' How can you ask that question without having first made an observation?</p> <p>4. Page 4: The individuals who edited what was presented to them by the Standards Committee clearly do not have an understanding of what a theory is. A theory is based on evidence, not belief!! Evolution is real. There are important details that we are trying to understand: gradual evolution vs. punctuated evolution. Bacteria have gradually evolved to become resistant to antibiotics. Ask the dinosaurs about punctuated evolution! There is a theory called gravitational theory. Gravity is real and the predictions of Einstein, based on observational evidence, have supported his General Theory of Relativity, but there are still experiments going on.</p> <p>5. Page 9, etc. As others have written, I am not happy with the addition of the 'Key Concepts' column. As has been stated by others, these are just words without connection to crosscutting concepts and as such become a checklist without a deeper understanding of learning.</p> <p>6. In general, because of my area of expertise, I will limit my comments to Earth and Space Science.</p>	Yes	Core Ideas	2. See comment 143 3. Lacks clarity 4. See comment 56.	5. In progress of edit
1081	I previously alluded to the confusion caused by writing 'refer to standard' in the standard. Refer to what? This lack of appropriate detail is very harmful to the overall integrity of this enormous effort. Critically, under Core Ideas for Knowing Science point L4 should be strengthened in scope and in direct language. Replace 'seeks to make clear' with 'explains'. And change end of sentence to '... of organisms and the processes by which they speciate and evolve to fit their environments.'	Yes	Core Ideas	See comment 56	
1082	No comment.	No			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	Yes	Core Idea	See Comment 56	
1092	Generally the introduction is strong and helps me understand the standards. With all the ADE additions, I question whether the time frames for instruction are appropriate. It seems like those will need to be doubled or tripled in order for teachers to now teach all of the vocabulary out of context.	No	Time		Not enough clarity
1095	I am not a teacher, but believe it is important to include the teaching of evolution as appropriate at every level.	Yes	Core Idea	See Comment 56	
1096	This section would benefit from examples of how the crosscutting concepts, core ideas, and practices might be represented in a curriculum exemplar.	No	Curriculum - Resources		
1133	They are generally well set-up	No	Comment		
1140	nothing to comment on by me	No	Comment		
1164	The integration of science study, the nature of science, and technology, and the cross cutting concepts are well explained.	No	Comment		
1165	No comment	No	Comment		
1167	It is Christian-based.	No	Comment		
1171	Only SCIENCE in Science class!	No	Comment		

1186	Seems very confusing, with all of the bubble charts.	No	Chart		
1210	<p>1. Page 2. I do like the addition of the discussion of patterns as a crosscutting concept.</p> <p>2. Page 3. The addition of 'Formally known as the scientific method' detracts from the significance of 'science and engineering practices.' As a scientist and science educator, the use of the term scientific method implied that science was like a recipe, going step by step. This is far from how real science is done.</p> <p>3. One thing that I failed to have incorporated into the original draft of the Science Standards (I was on the Standards Committee as well as the NGSS review). In the 40 or so years that I have been a practicing scientist, I never asked a question or defined a problem without first making an observation. In the Framework and NGSS they go so far to use the example of asking the question 'Why is the sky blue?' How can you ask that question without having first made an observation?</p> <p>4. Page 4: The individuals who edited what was presented to them by the Standards Committee clearly do not have an understanding of what a theory is. A theory is based on evidence, not belief!! Evolution is real. There are important details that we are trying to understand: gradual evolution vs. punctuated evolution. Bacteria have gradually evolved to become resistant to antibiotics. Ask the dinosaurs about punctuated evolution! There is a theory called gravitational theory. Gravity is real and the predictions of Einstein, based on observational evidence, have supported his General Theory of Relativity, but there are still experiments going on.</p> <p>5. Page 9, etc. As others have written, I am not happy with the addition of the 'Key Concepts' column. As has been stated by others, these are just words without connection to crosscutting concepts and as such become a checklist without a deeper understanding of learning.</p> <p>6. In general, because of my area of expertise, I will limit my comments to Earth and Space Science. Because of the setup of this form and the fact that I have received a message that my session will end soon. I will call this done and redo this at a time I can input all of my comments. There does not seem to be a way to save and return, just done.</p>	Yes	Core Ideas	See comment 1050	
1219	Get rid of intelligent design. Restore references to evolution.	No	Comment		
1221	Again it is too broad to understand exactly what they want.	No	Comment		
1222	Can be improved	No	Comment		
1223	Get rid of intelligent design. Restore references to evolution.	No	Comment		
1226	Don't revise.	No	Comment		
1237	The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.	No	Comment		
1246	none	No			
1252	I'd have appreciated a bit more detail but I realize how difficult that can be while maintaining readability, so it's not a big deal.	No	Comment		
1259	As a former educator I don't see information on how the standards are intended to be implemented. The information is very broad	No	Curriculum-Resources		
1278	It does not include an understanding of the progression of standards but is thorough and provides a solid overview of the standards and how to use them.	NO	Standards		
1287	Agree	No	Comment		
1291	The introduction has unnecessary information that takes away from the design and implementation	No	Organization		What information?
1293	The introduction under the Life, Physical and Earth and Space Science is not necessary.	No	Comment		Not found in introduction
1303	It provides enough information to know that these are inadequate, politically driven standards.	No	Comment		

1305	The following paragraph needs adjustment: One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns. In physical sciences, atomic structure is a pattern. In earth and space sciences, tectonic processes follow a pattern. Using graphs, charts, maps, and statistics in combination with the science and engineering practices, students can use their knowledge of patterns to formulate investigations, answer questions, and make informed predictions about observed phenomena. Classification systems are a result of patterns, not a representation. In all science disciplines, patterns are used in conjunction with data to form an explanation for observed behavior or make a prediction of future behavior. The use of the phrase The science and engineering practices, formerly the scientific method... is misleading. Scientists use science practices, not a set method for each experiment. The use of the term scientific method has not been a part of professional scientific practice for decades.	Yes	CCC		See comment 163
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	No	Comment		See comment 56
1315	While the introduction appears to mirror the NGSS Standards and NRC Framework, edits such as formerly known as the scientific method, the science and engineering practices... illustrate deep ignorance of how scientific practices, from field work to argumentation with evidence, represent a profound shift in understanding of how scientific knowledge is constructed. There never has been the scientific method, despite the stereotypical belief that hypothesis testing is the only method to be taught and learned.	No	Comment		
1337	I found the Internal Review additions to greatly improve the Introduction section.	No	Comment		
1339	They do not explain what the process was and who implemented the changes regarding the elimination and playing down of evolution. These changes cannot be accepted. I see no explanation here as to why these changes were made.	No	Comment		
1341	This introduction is slightly better than the 2004 standards, but it will not prepare teachers to understand 3-dimensional implementation.	No	Professional Development		
1342	1. The difference in high school essential standards and standards plus is not clear. 2. It is incorrect to refer to the science and engineering practices as formerly the scientific method 3. I do not believe the following disclaimer is enough to prevent many teachers from using the key concepts as performance objectives, just like the current flawed standard lists. Suggestions for key concepts and connections to other content area standards are included to assist teachers when implementing the Science Standards and are not intended to be the minimum or maximum content limits.	Yes	Introduction		1. Committee with ADE should make a solution to solve the confusion 2. See comment 143 3. See comment 380
1348	Do not alter the standards to weaken true science re: evolution, etc.	No	Comment		
1366	Original language should remain	No	Comment		
1370	It is very comprehensive.	No	Comment		
1384	While I support the removal of the term scientific method, the very wordy replacement, repeated multiple times throughout the document, needs to be rethought.	No	Comment		Lacks clarity of "wordy replacement"
1403	Teach evolution. Evolution is science.	No	Comment		
1408	The Key Concepts column makes sense. It gives teachers some direction on where to go with the standard. Without them, we would struggle to come up with reasonable test questions. If I cover waves with light and someone else covers them with springs, the state testing might be confusing for one group or the other.	No	Key Concepts		See comment 380

1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.	No	Comment		
1443	No much difference between 2014 and current	No	Comment		
1449	I have spent some time in the A Framework for K-12 Science Education that I believe these new standards were based on. Someone who has not done so is not likely to understand the difference between big ideas and key concepts unless training are administered or teachers are given more time to review standards before teaching them next year.	No	Professional Development		
1464	I am concerned you didn't even have the expertise to correctly describe the Earth's crust on a public document. I'd be embarrassed....truly I feel for you. Like I said...What I am understanding is that we've got teachers with limited knowledge of science writing this curriculum and if that's what you're trying to convey than you did it! Nice! But I don't think that's what you're trying to do. I'd do it for free honestly...I'd review your science materials because I actually care about the children and what they learn. I've definitely got the expertise to write all the Earth Science and Space Science here.	No	Comment		
1481	My general comments are included previously and apply to the various grade levels.	No	Comment		
1483	Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.	No	Comment		see comment 56
1485	Organization is okay.	No	Organization		
1515	I appreciate the attempts to include a broader understanding of the scientific process in the standards, however I do not see that well-reflected in the standards themselves.	No	Comment on SEPs		Science and Engineering practices are reflected in the introduction as part of 3-dimensional learning
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	No	Comment		see comment 56
1538	The introduction is clear about how the standards are organized and the importance of the intertwining of core ideas, crosscutting concepts, and scientific practices.	No	Organization		
1547	Removal/replacement/minimizing evolution is completely unacceptable.	No	Comment		see comment 56
1553	Again, the framing of the verbage is sneaky and backhanded	No	Comment		
1556	Needs to be redrafted to remove intelligent design options.	No	Comment		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	No	Comment		see comment 56
1583	Adding and maintaining teaching Evolution needs to be continued.	No	Comment		see comment 56
1595	There is way too much information that is cluttering up these standards. It is hard to see what is going on and where to start and where to finish. Take a look at New York State standards they are much clearer on what the teacher should be looking at. http://www.p12.nysed.gov/ciai/mst/sci/documents/p-12-science-learning-standards.pdf	No			Arizona Board of Education Directive
1603	Evolution. PUT IT BACK.	No	Comment		see comment 56
1605	I have concerns about the number of minutes per week listed for teaching science. There are many opportunities for integrating science instruction with reading, writing, and mathematics and the table of minutes does not make clear if this type of integration into other subject areas can be included in number of minutes specified. Especially in schools with half day kindergarten, devoting 90 minutes a week solely to science instruction is not realistic, unless those minutes can be counted as part of an integrated study of reading, writing, and math.	Yes	Time	Possible to suggestion to reword pg 6 of intro	Time allotment and implimentation are local control
1628	Teach Science and facts in Schools not faith and religion.	No	Comment		see comment 56
1639	No. Too complicated.	No			Too broad
1641	N/A	No			
1645	No comment.	No			
1664	See comment #9	No			

1678	The unity and diversity of organisms, living and extinct, is the result of evolution. Is clearly the more scientific supported statement and should remain. Removing it would obfuscate the intent of science class in that it would be unclear if teachers are supposed to teach science as it is best understood or adhere to religious opinion.	No	Comment		see comment 56
1681	I saw no issues with the changes made to the introduction. I feel it provided more clarity.	No	Comment		
1693	They are satisfactory.	No	Comment		
1694	Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.	No	Comment		
1709	The introduction states, Standards are what a student needs to know, understand, and be able to do by the end of each grade. They build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels. While clearly stated, the standards themselves are not nearly comprehensive enough or rigorous enough. You must give more performance related objectives in order for the local districts to develop year long curricula.	Yes	Standards	No changes	Adding PO's was not the intent of the revision. Addition of "learning progression may help with clarity. Curriculum and instruction is local control.
1753	To step away from normative terms such as evolution without justifying or in effect disproving evolution calls into question the method by which the standards were designed	No	Comment		see comment 56
1777	It's acceptable.	No	Comment		
1793	Please do not muddy the language regarding evolution	No	Comment		see comment 56
1799	Teach Science	No	Comment		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	No	Core Ideas		Too broad; lacks clarity
1811	Revert all of Diane Douglas's changes.	No	Comment		
1859	Continue to teach evolution. Do not remove it to teach creationism	No	Comment		see comment 56
1890	Could use some work	No	Comment		
1892	These are moronic standards. They are a true disservice to students and educators. Look to Bertha Vasquez who teaches in the Miami, FL school system. She works with Richard Dawkins on teaching evolutionary science to her kids.				
1893	The vast majority of the introduction seems well designed, however the actual standards don't seem to completely reflect this. In particular, HS.E2U2.17 doesn't provide specific guidance with regard to theories and scientific evidence surrounding the origin of the universe and HS.L4U2.31 fails to do the same with regard to biological evolution. This leaves the core ideas unsupported. If standards are what a student needs to know, understand, and be able to do, then they should be elaborated upon much more specifically. For example, the Key Concepts listed under HS.L4U2.31 includes artificial but not natural selection.				
1916	Yes. They are sufficiently informative. However, throughout the document, the science and engineering practices are followed by the statement: formerly known as the scientific method. This is not the case and the Framework makes this very clear. These are different approaches and should not be conflated. By using this term, it makes it look like we just changed the name. This is absolutely not the case. I would refer the committee to this 2-page summary: http://stemteachingtools.org/brief/32				
1918	Refer to my response to question 17.				

1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.				
1929	For someone new to this process, all is very long and not very concrete. I like that the difference between curriculum and standards was explained, for example, but it's not clear to me how much more 'curriculum' the teachers have the freedom to develop given the amount and detail of the standards, which don't just include topics but detailed instructions on what activities the students are supposed to perform. Other specific comments: Page 3, Science and Engineering Practices The scientific and engineering practices included in the standards are not 'formerly known as the scientific method'. 'The scientific method' is a formal, specific process founded in the philosophy of science and sometimes known as 'strong inference'. It is the gold standard for how conclusions are drawn, and while many of the practices listed here are in practice relevant, they are not part of the formal scientific method. The scientific method or 'strong inference' method of reasoning requires at its core multiple hypotheses, not a single one, so the next line should be revised to read 'hypotheses' if it is included at all. Page 4: Core ideas table 4: 'the theory of evolution' does not 'make clear' the unity and diversity of organisms, but instead provides an explanation for it. Providing causal explanation is not the same as simply clarifying that diversity exists, which anyway is done by finding lots of different organisms, not by any theory. U3: Why don't you think that 'products' should 'serve human ends'? U4: What are the negative implications of science? Summary table on page 20 Why are there no examples for U3, knowledge produced by science is useful for products, in the life science standards? Plenty of examples to choose from, including communicable diseases, medical diagnoses and treatments, agriculture practices, food production and consumption.				
1930	Vague and misleading regarding Life Science teaching Evolution as a widely accepted theory in science.				
1945	Needs to include consideration of what science CANNOT explain, so that students will realize the limitations of science.				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2008	seems fine				

2013	Basically a good introduction. I take strong exception to the comments on pg 3 that states that the Scientific Method promoting a hypothesis that is tested and then concluded is a linear process. Obviously, the person who wrote that has never performed scientific experiments. And on page 4, the idea that evolution is a theory and that everything has positive and negative effects must be removed. They are both erroneous statements of bias. And tell me, when are products made that do not serve human ends? On page 6 the Dept of Education starts replacing the word Core with Essential - that should be changed back because it again shows a bias and does not reflect an unbiased approach to the need for imparting scientific knowledge to students.				
2015	Insufficient detail on scientific concepts.				
2030	Please revise L4 Evolution theory statement.				
2036	It is understandable.				
2043	All standards need to be included.				
2060	For high school students, the paragraph on p. 62 states: 'Students in high school should have access to up-to-date information in the field while simultaneously gaining understanding of the historical developments which shaped today's understandings within the field. The Standards for life science encompass the areas of cells and organisms; ecosystems, interactions, energy and dynamics; heredity; and biological diversity.' However, it seems to me that students are expected to understand biological diversity without really knowing how it comes to be. Below the introductory paragraph on p. 63 is a multicolored table. The header on the left of this table appears to summarize, 'The Life Sciences Essential Standards (LSES) (that) are intended for ALL students to learn across 3 credits of high school science courses.' The numbers of these essential standards devoted to different topics within the entirety of life sciences (pp. 63-68) are: Ecosystems: 2; Cells and organisms: 8; Genetics: 3; Evolution: 1. I find it interesting that all of biology can be captured for high school students with such brevity, but this is how it seems. However, it is even more interesting that while Evolution is considered the most fundamental concept in biology, the single standard on Evolution in the LSES (p. 68) is: 'Obtain, evaluate, and communicate evidence that describes how inherited traits in a population can lead to biological diversity.' This statement is incomplete in almost every way regarding the consensus among biological scientists as to what evolution is and how it occurs. Specifically, there is no mention of what natural selection is, how it works on traits within and among populations of organisms, how it allows for particular heritable traits to be transmitted among generations, and how it may lead to evolutionary change. There are key concepts mentioned within the table that students are supposed to master (e.g., adaptation, artificial selection, competition for mates, coevolution), but there is no clear connection between the standards and how these concepts will be understood.				
2062	No comment.				
2093	This wording is confusing: Phenomena are events or situations that are observed to exist or happen, especially those whose causes or explanations are in question. The causes or explanations are in question or are the causes and explanations unknown?				
2096	It explains it but the details are hidden, which is wrong. The main point should be in the introduction.				
2109	Easy to understand.				
2112	Evolution is referred to in a misleading way or is removed. This is unacceptable and must be changed. Otherwise, the introduction does provide a useful overview.				

2115	In general yes. However, some recent revisions muddy rather than clarify the introduction, and in some cases are factually incorrect. For example: One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns. No. Classification systems represent evolution relationships among organism in simplified form. In other words, a classification system represents a specific hypothesis of evolutionary relationships. Classifications which merely represent patterns (such as an identification guide which groups flowers by color) are rejected as unscientific. The distinction between artificial and natural (process-based, scientific) patterns is a critical concept which the author of the above revision apparently does not understand..				
2127	I have not read the full draft, so have no comment on this				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Overall the introduction is written well. Changes that need to be made:Pg. 3 -- delete formerly known as the scientific method . The practices should not be reduced to a single set of procedures. Possible solution: delete the wording formerly known as scientific method . If a desire to include additional information, insert which includes discussion and use of scientific methods after science and engineering practices . This can be done throughout the document where the words formerly known as scientific method are written in each grade level introductions.				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include more information on Evolution, and omit all mention of Intelligent Design .				
2271	Sad but it does say how it should be implemented				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2284	Quite clear as it was written originally. The changes are not clear....				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2322	Understanding the theory of evolution is critical to the fields of medicine, biology, and more.				
2345	The removal of facts about evolution has rendered this entire 2018 Science Standard Draft a joke and until this is completely revised and EVOLUTION which is based on substantial facts and evidence is restored its useless. I have no problems with mentioning that Christianity believes otherwise in INTELLIGENT DESIGN but that this is not supported by facts and evidence.				
2348	Scrap and start over. Too many bubble concepts. Do you really need an 85 page document?				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2384	The standards must be reviewed to include elements that are taught in other states.				

2387	The introduction is confusing. While the last set of standards was divided into 6 strands, this set has 10 core ideas, but they are linked to specific scientific domains, i.e., physical science, life science, earth and space science. The inquiry process has been removed as a core idea.				
2399	It needs review.				
2400	Why can't the state just adopt the NGSS Standards?				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2425	As sent by the 111 science specialists in November 2017 (left unchanged).				
2428	The changes are unacceptable.				
2463	The introduction is helpful in understanding the purpose and thought process behind the standards. I do worry that this is based on a lot of theory and not so much in functional practice.				
2465	The introduction section gives a nod to the Framework for K-12 Science Education and a three dimensional approach to science education. However, the core ideas (pg. 4) needs to be removed and replaced by disciplinary core ideas being used by the rest of the US. The knowing and using science borrowed from the United Kingdom and does not reflect the most current research in science education. I am not sure how or why these were selected. It will do our teachers and students a GRAVE disservice by focusing on content and practices not used and supported by the rest of the nation. Further, the emphasis of certain cross cutting concepts at grade levels also does a disservice. These are meant to be transdisciplinary. More than one cross cutting concept can be emphasized.				
2470	Engineering practices is not the same as scientific method.				
2471	a bit dense for average reader without science knowledge				
2487	Adequate				
2499	I like the separation of science instruction into three dimensions; it makes the abstract ideas of science more concrete and organized, and shows their interconnectedness.				
2515	See previous comments				
2518	It's fine.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	Outside of previous language the directions are predominately clear.				
2540	I must reject all changes due to ending appropriate language regarding accepted scientific method				
2550	The Introduction provides a high level view of the concepts. It does not provide an explanation of how the standards are designed or intended to be implemented. That information would require volumes of content for each topic.				
2559	The science and engineering practices were not formerly known as the scientific method.				
2567	There are many things missing from these standards. Nature of Science is so important. I was hoping to see an improvement in this area, not just a glancing explanation.				
2570	Language is confusing.				
2574	Good use of image and examples.				
2579	As a teacher, yes, I'm not sure about as a parent.				
2582	I have not had the opportunity to read the introduction.				

2605	I was appalled to read formerly known as the scientific method . The scientific method remains the cornerstone of science and being dismissive of the term is not helping! I felt the introduction went into too much detail with examples and was overall too long-winded. I was glad that it refers to energy and matter, unfortunately changes suggested later on in the document now break this reference by replacing energy and matter with stability and change inappropriately where it's use was correct before. I am curious who made these edits as they were clearly not made by scientists.				
2610	Yes, the introduction is easy for me to read, but some may find the language or format daunting.				
2611	As I read the introduction it is very reminiscent of the Framework. However, that is not what I necessarily see with all the edits in the rest of the document.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2619	The introduction does a good job explaining the strands and the naming conventions.				
2624	The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.				
2642	The introduction is good, up until the point where it is edited to make the language on what evolution is and how it is to be taught less clear.				
2649	There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.				
2653	It makes it seem like Science is an afterthought.				
2654	The introduction to each grade level is adequate at this time.				
2658	n/a				
2665	State additions help considerably. Before was too vague. A standard needs to be well-defined. How it is taught and how kids' understanding is assessed is left to the teachers as it should be.				

Survey Question	14. Please comment on the Appendices.				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
38	Good inclusion of Science and Engineering practices.				
65	Again, the internal review edits only damage the rigor and our ability to accurately teach real science concepts.				
66	I				
69	N/A				
80	again, no one cares				
89	Not needed				
108	In the appendix about the practices: The scientific method and the scientific practices are NOT the same thing. Remove any references to the scientific method. THE scientific method does not exist; there are many scientific ways to answer questions, not just one.				
114	no comment				

143	However I believe that L4 from the Core Ideas for Knowing Science needs to be changed back into the correct wording from the Big Ideas that were used. The diversity of organisms, living and extinct, is the result of evolution.				
145	Appendix 1 It seems unethical to document that they are using the K-12 Framework for Science Education and put all their own verbiage in for explaining the CCC. If they are going to footnote it they should probably use the experts language. Appendix 2 is perfect Appendix 3 page 77 P4 Should not be allowed to be modified from the original statement. It should say: The total amount of energy in the Universe is always the same but can transferred from on energy store to another during an event. Page 78 L4 Should be back to the original : The diversity of organisms, living and extinct, is the result of evolution. Appendix 4 and 5 are good.				
152	The very fact that an appendix is even needed speaks to the need for revision of the standards themselves. It reads more like a complex legal document than a solid framework for core scientific knowledge acquisition and practice.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
163	In general, the appendices are an excellent addition to the standards. Add a citation to the ADE additions in Appendix 1. Remove the inappropriate ADE addition of scientific method from Appendix 2. Please consult with appropriate experts in higher education for all ADE changes made in Appendix 3 to ensure scientific accuracy and appropriateness.				
171	Inaccuracy in the appendix regarding E1: This in turn leads to movement of the plates which form the Earth's crust , PLEASE NOTE: THE PLATES ARE NOT JUST CRUST, THEY ARE THE UPPER MANTLE AND THE CRUST, THIS IS CALLED THE LITHOSPHERE! ALSO NOTE REDUCING THE CHANGES THAT OCCUR ON THE EARTH TO FORMATION AND WEATHERING OF ROCK IS OVERSYMPLYIFYING A VERY COMPLEX WORLD!				
172	in Appendix 3 with respect to Earth Science I strongly disagree with explanation of the core ideas. For instance when it states that the plate of the earth are made up of the crust: this is completely incorrect! The plates are composed of the lithosphere: the crust and the upper part of the mantle! And if simplifies climate as a result of energy from the sun: there is a list of more than 30 things that affect climate, most of which have nothing to do with the energy from the sun. And to reduce the processes that occur on earth to the formation and weathering of rock is so shallow. So much for breadth, depth and rigor of these standards. Once again to reduce all of geology, meteorology and astronomy to two core ideas is just despicable. We live on the Earth, we need to spend more time teaching our students the facts about the Earth. Today much of what people know about the Earth comes from media, where the facts are in question.other portions of the appendices, at least the general parts are okay, I cannot speak to the specific core ideas for physical science or life sciences.				
180	Needs to be written in form of objectives in a sentence				
181	We need more defined standards. Is an investigation a new term for designing an experiment?				
184	They should break it down into grade levels. It is extremely overwhelming to look at it all as a whole.				
185	needs to be labeled better				
186	It is helpful				
188	They are required, if you keep this as is.				
189	Better labeling would be helpful. More organized formatting.				
190	It's not user friendly or grade specific. To overwhelming and wordy.				
191	They are not helpful for me because again, there are no examples of what this means, exactly. Just more definitions, which is not helpful to me when I am planning a lesson.				

195	Explains and summarizes the core concepts and practices. Good examples and explanations.				
196	yes, it explains and summarizes the the core concepts and practices.				
208	Too complicated!! Should not require any appendices.				
218	I like the specific nature of the new science/engineering process. This will help align instruction across schools				
220	The Appendices provide greater details on the science and engineering practices.				
225	They are a good source for reference.				
228	Fine.				
235	Our team has questions about the DO in this area.				
250	The Appendices does not content to the content of the standards.				
252	The overall map for each grade level bonding is good and the map linking other disciplines is organized.				
257	Appendices are always useful.				
265	Appendix 1Pages 71-73Restore to what the teachers asked for. Remove the additions by ADE.Appendix 3Pages 77-79Restore to what the teachers asked for. Remove the additions by ADE.				
267	Awesome except strange and inaccurate wording of the evolution big ideal				
269	I particularly liked the section about crosscutting concepts as it lays out a few ideas and purpose of the focus.				
277	Although, I would like more information to help me fully teach these topics.				
279	These should be in chart format to make it easier to reference.				
284	science vs engineering is goodHowever the other would be for scientists, not teachers/students				
291	They are very helpful and probably should be much more strongly referenced in the introduction so they are not missed.				
292	No comment.				
300	Return language about evolution to original language				
311	These are not what the committee created				
317	They seem to be adequate				
326	There was more information in the Appendices which gave me a stronger understanding of the science standards and what is to be implemented in the classroom.				
328	The wording of the explanation of Core Idea L4 on page 78 is confusing and inaccurate. First, the phrase 'are believed to' is used, which represents a fundamental misunderstanding of the nature of scientific theory. Science does not deal in 'beliefs,' but rather analysis and interpretation of empirical evidence. In fact, this is the only instance in the whole document of the use of the word 'believe.' Secondly, while the explanation would read better if the words 'are believed to' were deleted, 'Over countless generations changes resulting from natural diversity within a species lead to the selection of those individuals best suited to survive under certain conditions' is still inaccurate. The generations are not 'countless,' which is a meaningless word. One can, in fact, count generations. Also, the changes do not 'result from natural diversity,' they are caused by random mutation, which in turn contributes to the cause of genetic diversity within a species.				
334	I didn't realize that they were even there at first so you may want to have a more clear reference to them. Most educators will look at their section of the standards and little else.				
335	Easy to follow.				

342	There are a couple specific wording changes that should be made: Any theory or model is provisional and subject to revision in the light of new data even though it may have led to predictions in accord with data in the past. This statement should say any theory, model, or LAW is provisional... because all science follows the same rules. There are many scientific laws that have been overturned through the years. Regarding L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. Which states, changes... are believed to lead to... I see no other laws theories or models that use the phrase are believed to. Please change the wording to be consistent. For instance, Gravity is believed to cause objects to fall and According to Coulomb's law, it is believed that opposite charges repel and like charges attract. Or remove the phrase in the statement on evolution.				
345	I feel the appendices should be made to match each specific grade level.				
352	The Appendices is very lengthy and not an easy read. Maybe one or two sentences to get the point across.				
354	The purpose of the appendices is unclear. Are, for example, the P1 core ideas what every students should know and this is where assessment will be pulled from? (which would be awesome)				
355	#2 is especially helpful to think about the differences between science and engineering. #3 can guide middle school and high school teachers of other subjects integrate science.				
358	The appendices would benefit from having the information in a graphic format more than just text. Use of charts or tables would help make the appendices are more effective resource				
359	It would be helpful if the appendices were to be specific to each grade level rather than a general statement for all.				
360	The appendices provide additional information on the cross cutting ideas, science and engineering practices and core ideas.				
362	Explains all the different parts of the science curriculum and the components of the standards draft.				
365	The appendices are a useful tool for understanding. They are one of the few parts of the standards that I feel like give practical examples of what these ideas *look like* in a classroom.				
366	I believe the appendices add understanding by distinguishing between science and engineering practices in pages 74-78.				
367	I believe the appendices add understanding by distinguishing between science and engineering practices in pages 74-78				
376	They are fine statements, but not necessarily super helpful.				
378	The Framework for K-12 Science Education and the Working with the Big Ideas of Science Education was a smart decision.				
380	Would like to see Nature of Science information .				
387	The cross curricular references to ELA and Math are extremely useful for students to learn all concepts across all areas.				
491	I don't care				
497	Appendices are vital to understand the standards				
512	The words that were added in green, in quotation marks here are unnecessary and aren't indicative of actual science stating the words believed to lead are not a scientific statement and should be removed as in the original draft. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals...				
550	Perfect				
1001	Na				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				

1020	27. Page 75, 1st paragraph, first sentence â€” see comment 19 - #2.28. Page 78, 5th paragraph, first sentence â€” see comment 19 - #3.29. Page 79, 6th paragraph â€” see comment 19 - #4.30. Page 79, 7th paragraph â€” see comment 19 - #5.31. Page 80, 3rd full paragraph â€” see comment 19 - #6.				
1025	As with much of this document, before editing the Appendices were clear and concise. The edits add unnecessary verbiage with no gain in clarity or rigor, and at times seem geared toward weakening science. For example, I see little utility in the addition of "Because the world is too large and complex to comprehend all at once, unless one were trying to undermine students' perception of our knowledge of the world."				
1030	authors & their affiliations				
1032	Same as above.				
1034	Do not differentiate science from religious beliefs				
1048	They are sufficient.				
1082	No comment.				
1085	Evolution is not just a theory, it is a well-established fact by science. Making Biological evolution to Theory of Evolution is a step backwards, not an improvement.				
1092	The appendices as written by the committees are helpful. Again, ADE changes need to be reversed.				
1096	The appendices are helpful, but are too brief.				
1131	L4: The theory of evolution seeks to make clear the unity and diversity of, living and extinct organisms. Over countless generations, changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. There is no belief in evolution; it is a scientific fact. Remove that word!				
1133	They tend to be superfluous, but my opinion on that may change as I work with them more.				
1140	very complete				
1164	I did not spend much time looking at the Appendices and am not prepared to comment on this section.				
1165	No comment				
1167	I have no objection to the Appendices.				
1171	Only SCIENCE in Science class!				
1186	Shouldn't really have to use them if the language was clearer in the first place.				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	They don't help.				
1223	Get rid of intelligent design. Restore references to evolution.				
1226	Don't revise.				
1241	While the appendices as originally written look fine, the current edits to weaken language on evolution do not. These edits should be rejected.				
1259	The appendices are very general and still do not provide specifics for implementation.				
1260	The glossary in the current standards is lacking in the proposed standard.				
1274	Appendix 1: CCC needs to be reviewed by the standards working group as there are significant additions beyond what the group proposed.				
1278	Solid and helpful.				
1287	Agree				
1291	Once again too much information that takes away from the main focus.				
1293	Under L4 need to reinstate the original text and take out "are believed to."				
1303	Yes, the appendices appear to supplement these inadequate, politically driven standards.				
1304	I especially like appendix three.				

1305	The use of the phrase "The science and engineering practices, formerly the scientific method..." is misleading. Scientists use science practices, not a set method for each experiment. The use of the term "scientific method" has not been a part of professional scientific practice for decades. In Appendix 3, the following paragraph needs adjustment: Core Ideas for Knowing Science P1: All matter in the Universe is made of very small particles. Atoms are the building blocks of all normal matter, living and non-living. The behavior and arrangement of the atoms explains the properties of different materials. In chemical reactions atoms are rearranged to form new substances. Each atom has a nucleus, containing neutrons and protons, surrounded by electrons. The opposite electric charges of protons and electrons attract each other, keeping atoms together and accounting for the formation of some compounds. Physicists and astronomers have begun to investigate other types of matter, dark matter, antimatter, and negative matter, which are also thought to be made up of very small particles. Those particles may or may not be atoms and tend to react differently to forces than normal matter. The inclusion of the final two sentences is not developmentally appropriate to a K-12 science standards document as such topics far exceed the boundaries of high school physics. Also in Appendix 3: L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct. Evolution is a scientifically sound explanation for the alteration of species over time. This is not up for debate within the scientific community.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	While drawn from the NRC Framework, the appendices are too vague and presented without research-based evidence to support the claims. They will be of little use to teachers who themselves are unfamiliar with the NRC document or experienced in doing science.				
1337	The Appendices supply additional insights that can help teachers and ultimately students by adding context in the relevant areas. I especially like the Internal Review changes and additions, they very much improved the draft.				
1339	Again, lack of reference to evolution is a major flaw.				
1341	While the appendices are helpful, they are not linked in a way that will engage many educators, and still fall short of providing the background and examples needed to make informed curricular choices.				
1342	1. The science and engineering practices are not the same as the scientific method! 2. This whole section in the Core Ideas is flawed, particularly with the insertion of "are believed to": L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct. 3. I disagree that the following is the main or only purpose of science: U1: Science's purpose is to find the cause or causes of phenomena in the natural world. 4. Appendix 4 points out interdisciplinary connections, but there is nothing on health standards, which are found throughout the document.				
1348	Do not alter the standards to weaken true science re: evolution, etc.				
1366	Original language should remain				

1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.				
1443	No much difference between 2014 and current				
1464	Like I said, I think appendix 3? Ya that one... review...review...review. Page 79 is disgraceful. It embarrasses me for you. I'll fix it for free...honestly I would. It's that bad.				
1485	I couldn't see that it added very much. I like the idea of a glossary in the current standards better				
1515	The strange mix of descriptive child development and prescriptive or aspirational formulation in the text makes it challenging to unpack. Further, statements of fact should be justified with a citation to a reliable source, rather than merely stated. To understand this distinction between descriptive and prescriptive text, let me give two examples: As students age, their ability to analyze and predict outcomes strengthens is a descriptive statement of child development (and one which is accurate and uncontroversial, but still needs a citation). Conversely, In high school, nuclear processes are introduced along with conservation laws related specifically to nuclear processes is more in line with a standard or prescriptive statement. It is sometimes unclear what the intent of a passage is; if descriptive statements are going to be made to justify ideas, they should be cited to scientific sources, as any academic work would do.				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1533	Yes, they help to define some concepts. Please make L4 in Appendix 3 more direct, such as Over generations, changes resulting from natural diversity within a species to lead to the selection of those individuals best suited to survive under certain conditions.				
1538	Appendix 4 on equity and diversity is admirable. However, I think it still suffers from a deficit framing of some students. I do like the use of opportunity gap rather than achievement gap, but it still paints students from low socioeconomic status and other marginalized communities as lacking in critical experiences rather than that science instruction has failed to make adequate connections to their strengths.				
1547	Removal/replacement/minimizing evolution is completely unacceptable.				
1553	See above				
1556	This needs to be redrafted to benefit the education of our children.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1579	L4 is highly problematic.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	There is way too much information that is cluttering up these standards. It is hard to see what is going on and where to start and where to finish. Take a look at New York State standards they are much clearer on what the teacher should be looking at. http://www.p12.nysed.gov/ciai/mst/sci/documents/p-12-science-learning-standards.pdf				
1603	We HAVE read our history of science, haven't we? This is unconstitutional - teach evolution!				
1628	Teach Science and facts in Schools not faith and religion.				

1639	Too complicated. The entire organization is too complicated. The NSF version is less so, but still too complicated. It does not need to be so. Open up the Big Ideas to include the most important ideas in science that we want students in high school science to know. For Earth & Space, I came up with 13. ALL but two are ideas that are dealt with in other science courses (so 11 OVERLAP with other sciences). Once we come up with a core of these Big Ideas, we can extend those into General Science concepts, then narrow them down TO FIT into specific science core courses from there.				
1641	N/A				
1645	No comment.				
1664	See comment #9				
1678	Appendix 3:L4 the same disgusting dark ages rewrite of important scientific theoryAppendix 3:U3 why you would you choose a less specific and less accurate statement.Appendix 3:U4 changes the teaching standard from important concepts that one might take a university class on (like ethics) to an attempt to undermine science and technology				
1681	I like the appendices but take issue to two areas. L4 undermines the strengths of the theory of evolution with the phrase 'are believed to'. This is already implied by your statement in appendix U2. Your addition of the aforementioned verbiage is unnecessary and insulting to the teachers as it implies they don't understand your explanation of scientific theories. It undermines the inclusion of evolution in your standards and pretty clearly seems to be a political move. Please keep politics out of these standards and remove that verbiage.My second issue is with the limited scope of appendix U2. Although U2 includes factual data, there should also be a sentence explaining that scientific theories are not 'theories' in the way lay people use them, but have a massive amount of research behind them and data to support what it says.				
1693	They are satisfactory.				
1694	Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.				
1709	While helpful, the appendices do not provide substantive benefit to expanding the rigor of the proposed standards. Appendix 4 states, By incorporating the Arizona Mathematics Standards and practices with critical thinking in science instruction, educators provide students with opportunities to develop literacy in mathematics instruction. This goal is not reflected in the rigor of the standards, particularly at the high school level. the verb calculate is used only once in a key concept for biology and not at all in the standards.				
1777	It's acceptable.				
1793	Please do not muddy the language regarding evolution				
1799	Teach Science				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1892	It's all wrong!				
1893	The appendices are a helpful addition, but I would argue that they are only helpful to the degree that the standards themselves are well-written. I have already mentioned specific problems with the standards that make them less than useful to students and teachers.				
1918	Refer to my response to question 17.				

1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.				
1929	Didn't read so can't comment.				
1945	Good discussion of Science vs. Engineering. However, Core Idea L4 presents evolution as a theory, which is technically incorrect, and fails to mention other proposed explanations of origins and development.				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2013	Appendix 1 is questionable with the extensive comments by the Dept of Education. How about having a discussion about this appendix with the original drafters of the document? Appendix 3, L4 is so biased and anti-science that it is incomprehensible to a real scientist. Repeat after me, Evolution is NOT a theory, now write it 1000 times so you get the idea correct. Appendix 3, U1 should be rewritten to state The purpose of Science is to understand the cause or causes of phenomena in the natural world. Appendix 3, U3, should keep to serve human ends because that is precisely what the purpose is. If not, then please explain other purposes. Appendix 3, U4, should remove both positive and negative from the statement				
2015	Ambivalent.				
2036	They seem adequate.				
2043	All standards need to be included.				
2062	No comment.				
2093	I take exception to the wording of L4 in Appendix 3: Core Ideas: generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. It's not a belief-- it's a scientific process that has been shown to be true by living evidence.				
2096	They do explain what is meant by certain terms, which is important.				
2112	The appendices are useful.				
2127	I have not read the full draft, so have no comment on this				
2139	Why is theory added in front of evolution? To be accurate and consistent the word theory (as in a scientific theory) would need to be added to all science concepts. Otherwise it's use here and in other parts tries to suggest to the reader that they are using it with a different meaning more related to the term hypothesis - which it has well surpassed.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	The Learning Progressions of the Practices may want to be included as an appendix.				
2163	Hopefully the appendices will be incorporated into lesson planning and not ignored.				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				

2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2242	The Appendix 2 - delete scientific method ; NGSS has a progression document for the practices which would be helpful for teachers to see how these practices develop over time. Appendix 3 - These 14 core ideas come from Working with Big Ideas in Science Education and should cite the words/descriptions from the Working with Big Ideas in Science Education. Possible Solution: Restore committee's version				
2259	Send the standards back for review.				
2262	Explain evolution ze				
2265	Provide more information on Evolution, and omit anything to do with Creationism or Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2348	So now we're not teaching dinosaurs and extinction?				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2384	The standards must be reviewed.				
2387	While the appendices provide greater detail, the overall framework of the standards are lacking details.				
2400	There is no section for acknowledging the work of past scientists or making connections as to how science builds on itself through acquisition of knowledge.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2425	As sent by the 111 science specialists in November 2017 (left unchanged).				
2428	The changes are unacceptable.				
2463	I don't enjoy having to reference around multiple locations within an 84 page document to attempt to construct a meaningful trajectory for how to do my job. This would be exceptionally confusing to a newer teacher with very little support from colleagues.				
2465	Please replace Appendix 3: Core Ideas with disciplinary core content that more closely mirrors the disciplinary core content in A Framework for K-12 Science Education . Also, the way the standards are currently written, appendix 2 does not hold much weight. It should! But the approach of knowing and using science does not fully allow for all the practices to be incorporated into the standards.				
2487	Helpful supplements to further explain the concepts.				
2518	They're fine.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2574	They are very repetitive of the introductory material in the beginning and in each section.				
2581	It's a lot of extra unnecessary information. The description of a what a pattern is is particularly cringe-worthy to read. It reads like it was written by someone who never took a science class before.				

2582	I have not had the opportunity to read the appendices.				
2610	Yes, it is good to see specific line items written out instead of just numbers for concepts that those who refer to each of the concepts frequently will use.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2619	I didn't find them all that helpful. They are quite wordy and I'm not sure most teachers would even take the time to read them.				
2621	The appendices could function as the standards.				
2624	The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.				
2642	Most of them are good, except for the edits that involve speculative statements about dark matter and anti-matter, and that state that the Universe is not a closed system.				
2649	There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.				
2653	Teachers in this state do not need Appendices. They need education to be fully funded so that there are Science Labs and Materials, in all Science Classrooms.				
2658	n/a				

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	16. What would you like the working group to consider as they revise the Kindergarten 2018 DRAFT DRAFT DRAFT Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
6	Reword to say, Observe and ask questions... That is how students formulate their own questions... through observations. They are naturally curious.	Yes	K.I2.u2.6; k.I4u2.7	Insert: Observe, ask questions, and explain...	
38	Lots of standards in PS that seem above k, like sound waves.	No			
40	You are limited only from your willing to teach.	No			
56	Page 11, return to using the word observe and add describe (DOK level), instead of the suggested ask questions about - this is too informal and not appropriate for a STANDARD of learning.	Yes		Keep as is	The use of the practices as the standard in the writing is essential; "describe" is more curricular and not a scientific/engineering practice
89	No evolution?	No			Too broad for consideration
100	More hands on activities	No			Curricula/instruction
114	no comment	no			
124	n/a	no			
143	I believe that standard K.P2U2.1 is not developmentally appropriate that way that it is written, or how I interpret it. I also believe that the key concepts are misleading and should be developed at the district level, reaching from standards to curriculum.	Yes	k.p2u2.1 & key concepts		
145	Where there were internal changes there needs to be attention paid to the developmental appropriateness. Please re-check	yes			committee needs to look at progressions (Framework/Big Ideas)
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
166	Please provide some examples of text or activity ideas that could be used to teach each standard.	no			curricula/instruction
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			
170	Funding	no			
172	Because we don't have lots of weather issues in Arizona, I would like to see a rock and mineral standard added to kindergarten.	no			Rocks/minerals addressed in 1st grade
177	The very first kinder standard has become both a life and physical science standard. Additionally, to investigate entails planning and conducting experiments. The language should be refined to reflect the true science/engineering practice.	yes			re-write standard
181	Challenging.	no			
189	Hands on instructions to inspire an inquisitive mind.	no			Curricula/instruction
203	The Key concepts should be dropped from every grade level.	no			
208	Same as above - too complicated!!	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
214	Examples of what type of device Kindergarteners would create to extend/improve their senses.	no			curricula/instruction
220	The standards allow for flexibility for various learner proficiency levels.	no			
246	needs more break down in each standard	no			curricula/instruction
251	Definitely agree.	no			
252	Too much room for interpretation. How can they measure whether the students mastered the standards	no			assessment issue
258	There are too many standards for the Kinder group. They will not have time to cover all of those topics.	no			

265	KindergartenPage 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	yes		Remove "Connections to other Academic Standards" from document OR put in as an Appendix	If the other academic disciplines change their standards prior to the next adoption of science standards it is very difficult to amend current science standards. It is our understanding that the appendix would be easier to modify than the standards after adoption.
275	No, Kindergartners brains are not developed to evaluate.	no			
276	Some of the revisions are not grade level appropriate. Obtaining and evaluating body systems does not make sense at this level. If we want them to understand that the human body has different systems that have different basic functions, great! Let's re-word it to say that!	yes	K.L1.U1.5	Remove standards	There is not evidence in the Framework or the Big Ideas that this standard should be addressed in K-2.
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
292	That Kindergarten students need as much Kinesthetic activity as possible to enrich their learning.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
334	Weather should be moved or at least added to 2nd grade. I think it's good for them to have an introductory discussion/unit on weather, but it needs to come up again and they shouldn't be getting into all the specifics of precipitation.	yes	k.e1u1.3	Keep as is	
335	They look good.	no			
359	The K standards do not flow into first grade. The K standards are vague compared to the first grade standards. On first grade standards it states that KL2U2.7 concepts were taught however the K standard does not include soil, sand, and rocks.	no			Needs to be addressed by 1st grade
383	Introducing scientific method early	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
435	N/a	no			
451	Should leave Kindergarten out of science. Let them focus on reading, writing and tying their shoes.	no			
486	Providing appropriate vocabulary to connect to the standards.	no			
512	Remove the wording their associated body parts isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary.	Yes		Comment #143	
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no			does not pertain to grade level
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no			does not pertain to grade level
1020	7. Page 9, 2nd paragraph "see comment 19 - #2.	?			

1025	I have already commented on several sections, another change is the insertion of positively or negatively to discussing human impact on species extinction. Except for domestic examples like cows, pigs and chickens or pests like cockroaches and mice, I am unaware of a case where humans have positively impacted species abundance, so why is this addition necessary?	no			does not pertain to grade level
1081	As far as I know.	no			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no			does not pertain to grade level
1091	A kindergartner's level of understanding of the Theory of Evolution.	no			does not pertain to grade level
1092	Without ADE additions, this would be a strongly agree. Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally , many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove they key concepts column from the document. If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for K.E1U1.3 Follow this process for each of the kindergarten standards, not just the example below. Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. Scientists look for patterns and order when making observations about the world. Use observations to describe patterns in the natural world in order to answer scientific questions. Ask questions based on observations to find more information about the natural world.	yes	organization		in progress
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no			does not pertain to grade level
1136	Make science dynamic and exploratory	no			curriculum/instruction
1140	no	no			
1164	I would like to see the working group think about the standards from the point of view of a kindergartner through second grader. The standards tend to reflect the idea of beginning with what we want students to know when they graduate and then working backwards, instead of working from the beginning up.	yes	k-12 progression		developmentally appropriate based upon the framework
1165	No comment	no			
1167	Teaching accepted scientific theories CANNOT be started too young.	yes	K-12 progression		based upon research from the framework
1171	Only SCIENCE in Science class!	no			curriculum
1186	The kids are 5!!!! And the teachers are not science teachers.	no			

1196	Actual and complete science education	no			
1219	Get rid of intelligent design. Restore references to evolution.	no			does not pertain to grade level
1221	I'm not a kindergarten teacher.	no			
1222	Not utilize language in re Darwinism, natural selection or evolution.	no			does not pertain to grade level
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no			does not pertain to grade level
1226	Don't revise.	no			
1278	Consistently misses the importance of asking questions and questioning theories.	no			curriculum/instruction
1286	Check over all cases of removal of scientific theories.	no			too broad
1298	Strengthen the Standards. Eliminate any inkling about creationism or intelligent design - these teachings are for (some) churches.	no			does not pertain to grade level
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no			AZ Board of Education directive
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.	yes	organization		changes in progress
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no			based upon the framework
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no			does not pertain to grade level
1315	The edits in this section range from laughable to egregious in relation to scientific knowledge and practice. For example, on p. 10: light and sound are not impacted by the senses; five senses obtain a range of data from the natural world, not only light, sound, and vibrations.	no			doesn't state "impacted" rather body parts can "detect" light, sound, and vibrations
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no			
1339	Evolution must be introduced at the kindergarten level as it is a basic concept in science.	no			based upon research from the framework not developmentally appropriate
1341	At every grade level I see a structural problem with organization and connections. Specifically, life sciences and earth sciences are being misrepresented, or are lacking proper depth. The anecdotal examples given in the key concepts column will leave many teachers just implementing a snapshot of random material instead of embedding and utilizing the understanding and applications of science as a means to inspire and drive learning in other subject areas.	yes	organization		in progress
1366	Original language should remain	no			
1403	Teach evolution. Evolution is science.	no			see comment 1001
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.	no			see comment 1001
1443	No much difference between 2014 and current	no			
1464	Kids learn the most and the fastest. Don't take it easy on them. I learned multiplication in kindergarten...then again...I came from another country. As long as you do it in a fun way than the kids will love it.	no	instruction		
1485	It's hard to compare grades the way this is constructed. I didn't notice until I studied the old version and saw that the differences in grades are immediately apparent on the charts.	yes	organization		supplemental resource comparing across grade levels could be made available

1500	It's great that the students will learn about health! They also should learn a little about the environment that supports them and how to interact with it	no			addressed at the next grade level
1506	The word observe is consistently replaced by ask questions about , it would be stronger to say observe and ask questions about .	yes	standard		add "observe, and ask questions" back into life science standards K.I2U2.6 and K.L4U2.7
1517	Bring back the word evolution.	no			see comment 1001
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no			see comment 1001
1529	hands on involvement in experiment and founding principals of observation and hypothesis and experimentation	no			instruction
1547	Removal/replacement/minimizing evolution is completely unacceptable.	no			see comment 1001
1553	Actual science	no	too broad		
1556	Remove all religious references.	no			see comment 1001
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no			see comment 1001
1583	Adding and maintaining teaching Evolution needs to be continued.	no			see comment 1001
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!	yes	K-12 progression		see if addressed in math standards
1603	Evolution. Get the idea?	no			see comment 1001
1605	Narrow the scope. The educational focus in Kindergarten should be on reading, writing, and math while making connects through those disciplines to scientific ideas.	no			AZ State Board of Education question
1628	Teach Science and facts in Schools not faith and religion.	no			see comment 1001
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no			see comment 1001
1664	See comment #9	no			
1681	I have no issues. Seems appropriate.	no			
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.	no			see comment 1001
1694	Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.	no	Religion		
1793	Please do not muddy the language regarding evolution	no	Evolution		see comment 1001
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.Please don't avoid education on evolution.	no	Evolution		see comment 1001
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	Evolution		see comment 1001
1799	Teach Science not religion	no	religion		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	yes	Standard		Reconsider edits
1811	Revert all of Diane Douglas's changes.	yes	Standard		Reconsider edits
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	Evolution		see comment 1001
1886	Outside my area	no			
1890	Science at this grade level should be competitive to the rest of the nation. It is lacking in quality content and scientific community standards.	no	Comment		too broad
1892	Children are never too young to learn science.	no	comment		
1900	I think children could handle higher level science at this age since they are so curious at this age.	no	comment		

1918	Refer to my response to question 17.	no			
1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.	no	comment		see comment 1001
1929	I only put 'disagree' because they seem overly ambitious given the teacher training and resources available at this level.	no	curriculum resources		
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.	no	evolution		see comment 1001
1953	Teach proper evolution	no	evolution		see comment 1001
1955	Critical thinking; must know that there something it is called Science	no	comment		
1990	Evolution must continue to be taught.	no	evolution		see comment 1001
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	evolution		see comment 1001
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no	comment		
2008	I trust the experts who wrote these standards	no	comment		
2013	Kindergarten children are generally 5-6 years old. The do not need to know how to make predictions and it is ridiculous to put standards for children that are clearly beyond the scope of most toddlers. The concept that there are only 5 senses is archaic and should be removed. Many respected scientists agree that there are more than 5 senses.	yes	standard		there can be more than 5 senses (vestibular sense of balance) so remove the number 5 in standard K.P2U2.1
2015	Introduce more scientific concepts. Introduce introductory scientific theory and philosophy.	no	comment		not developmentally appropriate for kindergarten
2020	You can do much more here.	no	comment		
2032	Evolution	no	evolution		see comment 1001
2036	Again, creationism has no place in sound science teaching. It is retrogressive and intellectually suspect.	no	evolution		see comment 1001
2043	All standards need to be included.	no	comment		
2062	No comment.	no			
2093	Include Kindergarten teachers in the working group.	yes	other		They are included, the people reviewing these comments are former kindergarted teachers
2096	In kindergarten children should already be experimenting and developing a love of science. They need to learn that science begins with curiosity. There should be flexibility to allow students to drive their own investigation of something they are curious about.	no	curriculum		
2099	No form of creationism should be taught in public schools period. It s unconstitutional & will waste more tax payer \$ when it inevitably ends up going to court & gets shot down.	no	religion		

2112	This section seems fine, however, I would include more emphasis on observation . As an educator, scientist, and a father, one thing I am constantly getting my students, colleagues, and child to do is simply observe their surrounding. I think the idea of observing and trusting your observation is critical for problem solving and the sooner it starts, the better.	yes	standard		Refer to comment 1506
2115	No specific recommendations for this level	no	comment		
2127	I have not read the full draft, so have no comment on this	no	comment		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	evolution		see comment 1001
2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)	yes	standard		inprogress
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	evolution		see comment 1001
2256	Allow the students to gather information.	no	curriculum		
2259	Send the standards back for review.	yes			they are currently in review
2262	Explain evolution.	no	evolution		see comment 1001
2265	Include Evolution, omit Creationism and Intelligent Design .	no	evolution		see comment 1001
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no	comment		
2335	Do not include intelligent design as part of the option for teaching science. Not supported scientifically.	no	comment		
2345	Refer reply in 20 above.	no			
2348	scrap it	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	comment		AZ Board of Education directive
2372	It is obvious that science teachers and kinder teachers were not around when the green revisions were made.	no	comment		
2378	Needs to go back to review.	yes	comment		in progress
2384	We must start to educated all standards taught across the country, starting in the earliest levels of education.	no	comment		
2387	Please consider what is developmentally appropriate for kindergartners and develop their natural curiosity.	no	curriculum		
2410	I don't know, I'm sorry, I don't teach K!	no	comment		
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	evolution		see comment 1001
2425	As sent by the 111 science specialists in November 2017 (left unchanged).	no	comment		
2428	The changes are unacceptable.	no	comment		
2443	Kindergarten should be a time for learning how to interact with others and behave in school and not be so heavily focused on academic content. Our obsession with getting standards 'mastered' at such a young age is actually counter productive. Look at international research and look into brain mapping studies.	no	curriculum		
2465	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.	yes	organization		in progress
2487	N/A	no			

2515	Practical application of science, science experiments. Be very hands on.	no	curriculum		
2518	I couldn't care less about Kindergarten.	no	comment		
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	evolution		see comment 1001
2529	Include health standard that includes body awareness	no	other		see Arizona Health Standards
2539	Lack of engineering standards and design thinking concepts within the document.	no	comment		not developmentally appropriate for kindergarten
2540	Revised text	no	comment		
2582	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.	no	comment		content should be grade appropriate,
2607	Do not attempt to deny or water down the concepts of evolution.	no	evolution		see comment 1001
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	evolution		see comment 1001
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.	no	evolution		see comment 1001
2642	Put back in the word observe . At this age, learning to make proper observations is key.	yes	standard		see comment 1506
2669	Reword to say, Observe and ask questions... That is how students formulate their own questions... through observations. They are naturally curious.	yes	standard		see comment 1506

Survey Question	17. What would you like the working group to consider as they revise the 2018 DRAFT Physical Science Standards in the Kindergarten 2018 DRAFT Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
6	Well done.			no	
38	Consider where some of the content shows up in NGSS and then keep it there.			no	
40	The world where we live. Not just your classroom.	no			
89	Redo	no			
103	Simplify!	no			
114	no comment	no			
124	n/a	no			
143	I am just wondering if the wording of K.P2U2.1 changes this to a Life standard?	yes		See comment Q16 - 143	
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
166	Needs some revision about how to teach vibrations and how to design a tool to extend the senses ; that is not clear on what extending the senses means.	no			Curricula/instruction
170	Funding	no			
172	by adding mineral and rocks to this grade, you also have a link to physical standards: we use our senses to identify rocks and minerals	no			Rocks & Minerals addressed in 1st grade; curricula/instruction

189	Hands on instructions to inspire an inquisitive mind.	no			
208	Simplification.	no			
246	I like the critical thinking part, teachers will have teach their K students to do it	no			
250	Should include observations	no			
251	No revisions needed.	no			
252	Provide a measure that teachers can use to see if they have mastered this standard	no			
258	None	no			
265	Page 10Remove Key Concepts ColumnUnder K.P2U2.1 remove 'five' and 'their associated body parts' - this is Physical Science, not Life Science.	yes		see comment Q-16 - 143	
281	Nothing	no			
292	What I have mentioned in number 23.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	No suggestions.	no			
359	We would like to add with prompting and support to many of these standards like in our LAS standards	yes		Keep as is	The suggested wording does align with the Science & Engineering Practices
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
412	Include the idea of energy that we use in our everyday lives.	yes		Keep as is	Energy and Matter is a crosscutting concept that can be addressed in any individual lesson(s) as stated in the introductory of the Kindergarten standards on pg. 10
435	N/a	no			
512	Remove the wording their associated body parts isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes		see comment 143	
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	evolution		The L4 addressed at K level focuses only on how plants and animals respond to their environment.
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	evolution		see comment 1001
1081	Not reviewed.	no	comment		
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	evolution		see comment 1001
1091	A kindergartner's level of understanding of the Theory of Evolution.	no	evolution		see comment 1001
1092	Standards 1 is no longer a physical science standard and no longer makes sense due to the ADE changes.	no	other		need more informaton
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	evolution		see comment 1001
1140	no	no			
1165	No comment	no	comment		

1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.	no	evolution		see comment 1001
1171	Only SCIENCE in Science class!	no	comment		
1186	The teachers are not science teachers.	no	comment		
1196	See above	no			
1219	Get rid of intelligent design. Restore references to evolution.	no	evolution		see comment 1001
1221	I am not a kindergarten teacher.	no	comment		
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	evolution		see comment 1001
1226	Don't revise.	no	comment		
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	other		AZ Board of Education directive
1305	Investigate how the five senses and their associated body parts can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation. This standard is awkwardly written. Our sense of smell, for example, does not detect light, sound or vibrations from far away.	yes	standard		consider revising standard K.P2U2.1. students should be led to detect how their senses detect their environment. see comment 2013 regarding elimination of only 5 senses.
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	other		see comment 1303
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	evolution		see comment 1001
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	comment		in progress
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no	comment		
1366	Original language should remain	no	comment		too broad
1403	Teach evolution. Evolution is science.	no	evolution		see comment 1001
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.	no	religion		
1443	nothing	no			
1477	No intelligent design.	no	comment		
1500	They also should learn a little about the environment that supports them and how to interact with it, this is critical! We only have one plane, and humans are destroying it!	no	comment		addressed in other grade levels
1506	In this section there is the statement light and sound are impacted by the senses. My understanding is that it is the other way around.	yes	standard		see comment 1305
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	evolution		see comment 1001
1529	understanding earth science and space science principals like planetary bodies and the functions of natural cycles	no	comment		addressed in other grade levels
1538	K.P2U2.1 - The addition of five for five senses and the addition of their associated body parts is confusing. A better revision might be Investigate how the human body senses light, sound and vibrations when they come from far away.	yes	standard		see comment 1305. the suggested revision would limit senses to only humans, not animals.
1547	Removal/replacement/minimizing evolution is completely unacceptable.	no	evolution		see comment 1001
1553	A better working understanding of the world around then and its origins	no	comment		too broad
1556	Remove all religious references.	no	religion		

	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1575		no	religion		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	evolution		see comment 1001
1595	We have moved all of our other standards up so that what used to be first grade standards are now in Kindergartenm but in science. The five senses are something students learn through out life and are not needed in these standards. This si something that is taught in Preschool these days.	a. yes b. no	a. standard b. comment		a. standard is supported by the framework
1603	I could say evolution again, you know.	no	evolution		see comment 1001
1628	Teach Science and facts in Schools not faith and religion.	no	religion		
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	evolution		see comment 1001
1664	See comment #9	no			
1681	N/a	no			
1694	Only facts based on repeatable scientific tests.	no	comment		
1777	More observation and sense of wonder.	no	instruction		
1793	Please do not muddy the language regarding evolution	no	evolution		see comment 1001
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	evolution		see comment 1001
1799	Teaching Science not religion	no	religion		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	no	comment		too broad
1811	Revert all of Diane Douglas's changes.	no	comment		too broad
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	evolution		see comment 1001
1886	Outside my area	no	comment		
1890	Science at this grade level should be competitive to the rest of the nation as well as internationally. It is lacking in quality content and scientific community standards. I would like to see future STEM careers considered starting at the beginning of these curriculum grades.	no	comment		too broad
1892	Add evolution. Even young children can get the concept.	no	evolution		see comment 1001
1900	All children should have at the minimum 30 minutes PE daily.	no	comment		PE Standards
1918	Refer to my response to question 17.	no			
1923	Since the E&SS standards talk about precipitation, I'd like to see something about kindergarten students being able to identify three states of matter: solid, liquid, gas.	no	comment		addressed in first grade
1953	Teach proper evolution	no	evolution		see comment 1001
1955	scientific method	no	comment		
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	evolution		see comment 1001
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no	comment		
2013	Make it fun!! Make it exciting. Make it something that children will thrive on.	no	Instruction		
2015	Ambivalent.	no	comment		
2032	Evolution	no	evolution		see comment 1001
2043	All standards need to be included.	no	comment		too broad
2062	No comment.	no	comment		
2079	Science.	no	comment		

2093	For all science standards, the working group should consider if the standards are developmentally appropriate for the age group and if they are based on current science practices and scientific knowledge. There is no room for non-evidentiary (i.e. religious) belief in science. How do classroom teachers feel about the teachability of these standards?	no	comment		classroom teachers were involved in this process
2112	Emphasis on observation!	no	instruction		see comment 1506
2127	I have not read the full draft, so have no comment on this	no	comment		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	evolution		see comment 1001
2156	The focus of K.P2.U2.1 is a life science standard and not a physical science standard. This standard as written focuses on 3 senses (touch, sight, hearing - not taste/smell). If the standard is about the senses then it maybe better suited in a health standard and not science. Possible solutions: Plan and conduct an investigation to collect evidence that vibrating materials can make sound and that sound can make materials vibrate. Make observations to construct an explanation that objects can be seen only when illuminated.	no	comment		see comment 1305
2259	Send the standards back for review.	yes	comment		in progress
2262	Explain evolution.	no	evolution		see comment 1001
2265	Include Evolution, omit Creationism and Intelligent Design .	no	evolution		see comment 1001
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no	comment		
2314	Developmentally appropriate amounts of standards so students have necessary amounts of recess and learning through play	no	comment		PE standards
2345	Refer reply in 20 above.	no	comment		
2348	dinosaurs	no	comment		
2351	Where is the physics??	no	comment		not developmentally appropriate in kindergarten
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	comment		see comment 1303
2372	Consider that these are 6 year olds and the information needs to at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.	no	comment		science vocabulary is included in standards
2378	Needs to go back to review.	yes	comment		in progress
2380	Keep religious beliefs out of science standards. Children should be introduced to the principles of objective science at the earliest age.	no	religion		
2384	Evolution and climate change are commonly adopted science standards. They must not be left out.	no	evolution		see comment 1001
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	evolution		see comment 1001
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	evolution		see comment 1001

2428	The changes are unacceptable.	no	comment		too broad
2465	The physical science standards are actually more life science standards about human body senses. Nationally at Kindergarten, students are exploring forces of pushes and pulling.	yes	k-12 progression		developmentally appropriate based upon the framework
2487	N/A	no			
2515	see above.	no			
2518	I couldn't care less about Kindergarten.	no	comment		
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	evolution		see comment 1001
2539	adding design thinking to address K.P2U3.2 to build a foundation for this type of scientific thinking for students.	yes	standard		revise K.p2U3.2 to include "define problems and design solutions"
2540	Revised text	no	comment		too broad
2559	Due to changes made during the internal review, K.P2U2.1 is no longer a physical science standard but a life science standard.	Yes	standard		see comment 1305
2605	I would like more of a focus on the scientific method. Natural sciences were called Natural philosophy for a reason where philosophy refers to the love of knowledge and/or truth. This is a core concept which needs to be there from the beginning. How do we know that something is true? Please watch this https://www.youtube.com/watch?v=Yk5IWzTfWeM it is a great explanation and entitled how do we know what is true .	no	comment		too broad
2607	Do not attempt to deny or water down the concepts of evolution.	no	evolution		see comment 1001
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	evolution		see comment 1001
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.	no	evolution		see comment 1001
2642	This section is good as is.	no	comment		
2669	Well done.	no	comment		

Survey Question	18. What would you like the working group to consider as they revise the 2018 DRAFT Earth and Space Science Standards in the Kindergarten 2018 DRAFT Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
6	Include reading and preparing for weather forecasts.	no			Curricula/instruction
40	The same.	no			
89	Redo	no			
103	Simllify	no			
114	no comment	no			
124	n/a	no			
143	I think the Earth and Space Science Standards look good.	no			
145	Kindergarten students can not plan out an investigation- return to original- Observe, record and ask questions.	No			not applicable - there is not a standards in K earth/space science that states to "Plan an investigation"

157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
166	Looks great!	no			
170	Funding	no			
172	if you add rocks/minerals to this grade, you have a way to link the life science to earth science: living vs. non-living.	Yes		Keep as is	Minerals/Rocks in 1st grade; curricula/instruction decision
189	Hands on instructions to inspire an inquisitive mind.	no			
208	Simplification.	no			
251	No revisions needed.	no			
252	great	no			
258	None	no			
265	Remove Key Concepts Column	no			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	No suggestions.	no			
359	Make sure you are using consistent verbiage throughout especially in the key concept areas (I.E 4th grade Key concepts)	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
412	Make sure to include the idea of climate change.	no			
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	no			
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	evolution		Does not pertain to this grade level. L4 addressed at k level focuses only on how plants and animals respond to their environment.
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	evolution		see comment 1001
1031	Include climate change	no	standard		2nd grade standard
1041	They need to learn about the damaging effects of fossil fuels on the environment.	no	comment		not developmentally appropriate
1050	Page 11, K.E1U1.3 and 4: I am happy with the addition of 'and ask questions.' I just hope that this was not added to encourage students to question the science concepts related to their observations.	no	comment		
1081	Not reviewed.	no			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	evolution		see comment 1001
1091	A kindergartner's level of understanding of the Theory of Evolution.	no	evolution		see comment 1001
1092	Standard 4: Influence is an inappropriate term. Impact was accurate	yes	standard		revise standard K.E1U1.4 to state "impact"
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	evolution		see comment 1001
1140	no	no			

1165	No comment	no	comment		
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.	no	evolution		see comment 1001
1171	Only SCIENCE in Science class!	no	curriculum		
1186	the teachers are not science teachers.	no	comment		
1196	Climate change	no	comment		too broad
1221	Not a kindergarten teacher.	no	comment		
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	evolution		see comment 1001
1226	Don't revise.	no	comment		
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	other		AZ Board of Education directive
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	other		See comment 1303
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	evolution		see comment 1001
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	standard		under revision
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no	comment		
1339	Clearly include teaching the concept of evolution.	no	evolution		see comment 1001
1366	Original language should remain	yes	standard		under revision
1403	Teach evolution. Evolution is science.	no	evolution		see comment 1001
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.	no	religion		
1443	nothing	no			
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	evolution		see comment 1001
1529	providing hard science concepts with strong reference to robust science vocabulary	no	comment		too broad
1547	Removal/replacement/minimizing evolution is completely unacceptable.	no	evolution		see comment 1001
1553	Same as above except on a universal level	no	comment		too broad
1556	Remove all religious references.	no	religion		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	religion		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	evolution		see comment 1001
1595	We should include an investigation or something that would include the students studying and making conclusions. Plan and conduct an investigation to determine the effect of sunlight on Earth's surface	no	curriculum		
1603	How about some anthropogenic climate change too?	no	standard		2nd grade standard
1628	Teach Science and facts in Schools not faith and religion.	no	religion		
1641	N/A	no			
1645	No comment.	no	comment		
1660	Fix evolution standards.	no	evolution		see comment 1001
1664	See comment #9	no			
1681	N/a	no			
1694	Only facts based on repeatable scientific tests.	no	comment		too broad
1777	More sense of wonder.	no	instruction		

1793	Please do not muddy the language regarding evolution	no	evolution		see comment 1001
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	evolution		see comment 1001
1799	Teach Science, not religion	no	religion		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	yes	standard		under revision
1811	Revert all of Diane Douglas's changes.	yes	standard		under revision
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	evolution		see comment 1001
1877	Evolution!	no	evolution		see comment 1001
1886	Outside my area	no	comment		
1890	Science at this grade level should be competitive to the rest of the nation as well as internationally. It is lacking in quality content and scientific community standards. I would like to see future STEM careers considered starting at the beginning of these curriculum grades.	no	comment		too broad
1892	Make them better, not worse.	no	comment		too broad
1900	Teach evolution all oter is pseudo-science	no	evolution		see comment 1001
1918	Refer to my response to question 17.	no			
1941	Specific teachings on the big bang theory should be instituted.	no	comment		not developmentally appropriate in K
1953	Teach proper evolution	no	evolution		see comment 1001
1955	scientific method	no	comment		too broad
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	evolution		see comment 1001
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no	comment		too broad
2013	Make it fun!! Make it exciting. Make it something that children will thrive on. Also make it something that a child can relate to.	no	instruction		
2015	Ambivalent.	no	comment		
2032	Evolution	no	evolution		see comment 1001
2043	All standards need to be included.	no	comment		too broad
2062	No comment.	no	comment		
2079	Science.	no	comment		
2093	See above.	no			
2112	Emphasis on observation!	yes	standard		add "observe and ask questions" to like science standards K.L2U2.6 and K.I4U2.7
2127	NO teaching of intelligent design (ie creationism) in any classroom.	no	religion		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	evolution		see comment 1001
2180	some mythological alien did not make the sky blue, explain with science, as a parent i did along with math and basic earth science.	no	comment		too broad
2259	Send the standards back for review.	yes	standard		under revision
2262	Explain evolution.	no	evolution		see comment 1001
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .	no	evolution		see comment 1001
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	no	religion		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no	comment		too broad
2345	Refer reply in 20 above.	no			

2354	.....	no			
2360	It is impossible to understand geology without a basic understanding of evolution.	no	evolution		see comment 1001 geology is not taught in kindergarten
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	comment		see comment 1303
2372	Consider that these are 6 year olds and the information needs to at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.	no	comment		science vocabulary is included in the standards
2378	Needs to go back to review.	yes	standard		under review
2380	Keep religious beliefs out of science standards.	no	religion		
2384	Climate change is a crucial concept that should be taught to all kindergarten students.	no	comment		in 2nd grade standards
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	evolution		see comment 1001
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	evolution		see comment 1001
2428	Stick to actual science and stop dumbing down our children!	no	comment		too broad
2487	N/A	no			
2515	see above	no			
2518	I couldn't care less about Kindergarten.	no	comment		
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	evolution		see comment 1001
2539	N/A	no			
2540	Revised text	no	comment		
2607	Do not attempt to deny or water down the concepts of evolution.	no	evolution		see comment 1001
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	evolution		see comment 1001
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.	no	evolution		see comment 1001
2642	This section is good as is.	no	comment		
2669	Include reading and preparing for weather forecasts.	no	instruction		

Survey Question	19. What would you like the working group to consider as they revise the 2018 DRAFT Life Science Standards in the Kindergarten 2018 DRAFT Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
89	Redo	no			
103	Simplify	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			
124	n/a	no			
143	K.L1U1.5 - again this standard seems to reach beyond the conceptual level of a kindergartnerWhat is meant by obtain here? What are they to obtain? Investigate might be a more appropriate word for what I think the outcome is supposed to be.Key Concepts for K.L4U2.7 - how is farming related to specialized structures found on plants and animals	yes	k.l1.u1.5; kl4.u2.7	see comment Q#16 - 276	
145	K.L2U2.6 take out properties of as it is redundant. Living and non-living things do not have properties but rather characteristics. Does not need this additional language.	Yes	k.l2.u2.6	Remove the words "properties of"	Properties is used incorrectly as noted in the public comment
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
166	Looks great!	no			
170	Funding	no			
189	Hands on instructions to inspire an inquisitive mind.	no			
208	Simplification.	no			
251	I do not feel that these standards are appropriate for this grade level.	no			
252	maybe too much	no			
258	Move the body systems standard to a higher grade level in order to give the Kindergarteners a realistic load.	yes		see comment Q#16 - 276	
265	Page 11Remove Key Concepts ColumnRemove K.L1U1.5 - how will students 'Obtain' how the human body has different systems that carry out life processes? Also, since it is in green, the teacher's did not indicate that this is a standard that should be taught at the Kindergarten level.	yes		see comment Q#16 - 276	
276	Obtaining and evaluating body systems does not make sense at this level. If we want them to understand that the human body has different systems that have different basic functions, great! Let's re-word it to say that!Each standard must be age-appropriate, the revisions make them so they are not.	yes		see comment Q#16 - 276	
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	No suggestions.	no			
359	I would like to add something in earth and space sciences about how the earth rotates around the sun and a shadow is dependent on the location of the sun to an object. Also add in K.L2U2.6 classifying and sorting is is such an important skill that young learners need to practice. Also properties and states of matter should be introduced in kindergarten. sink and float experiments are appropriate and so fascinating to young learners. Kindergarten is so experiential they need a little bit of everything so 1.P3U1.3 can be broken down into 2 pieces so kindergarten students can understand that objects can be moved with out touching them.	Yes/no			Earth & Sun system is addressed in 2nd grade; Suggestion for classifying & sorting is an instructional decision; properties of matter are addressed in 2nd grade
383	I would prefer if age appropriate sex ed started in kindergarten, but that seems to be a different subject than just life science.	no			This should be addressed in the health academic standards

390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
412	Evolution should be front and center from an early stage in life. It promotes logical thinking skills.	no			
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	no			
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	evolution		Does not pertain to this grade level. L4 addressed at K level focuses only on how plants and animals responds to their envrionment
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	evolution		see comment 1001
1031	Evolution should be included	no	evolution		see comment 1001
1081	As far as I know, they are OK.	no	comment		
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	evolution		see comment 1001
1091	A kindergartner's level of understanding of the Theory of Evolution.	no	evolution		see comment 1001
1113	We need to start teaching children about all aspects of life including evolution from the very beginning.	no	evolution		see comment 1001
1165	No comment	no	comment		
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.	no	evolution		see comment 1001
1171	Only SCIENCE in Science class!	no	comment		
1186	The teachers are not science teachers.	no	comment		
1190	Environmental studies should include information regarding human impact.	no	comment		2nd grade standard
1196	Evolution	no	evolution		see comment 1001
1219	Get rid of intelligent design. Restore references to evolution.	no	evolution		see comment 1001
1221	Not a kindergarten teacher	no	comment		
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	evolution		see comment 1001
1226	Don't revise.	no	comment		
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.	no	evolution		see comment 1001
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	other		AZ Board of Education directive
1305	Obtain, evaluate, and communicate how the human body has different systems that carry out life processes. A kindergartner evaluating how the human body has different systems that carry out life processes is not developmentally appropriate.	no	comment		too broad
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	comment		see comment 1303

1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	evolution		see comment 1001
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	comment		under revision
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no	comment		
1338	This applies to the Distribution of K-2 standards - page 20:' L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.'This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'	no	evolution		see comment 1001
1339	Clearly include teaching the concept of evolution.	no	evolution		see comment 1001
1366	Original language should remain	yes	comment		under revision
1403	Teach evolution. Evolution is science.	no	evolution		see comment 1001
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example,in the Maya creation myth, humans are created out of corn.	no	religion		
1443	nothing	no			
1500	They need to start learning about where they and everything came from, via evolution	no	evolution		see comment 1001
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	evolution		see comment 1001
1529	making certain children are reading secular science text and story books not being led down mythological fairy paths	no	instruction		
1538	K.L1U1.5 - The wording is confusing because there is no noun associated with the words obtain, evaluate, and communicate. A suggested revision would be Obtain, evaluate, and communicate information about human body systems carry out life processes K.L1U2.6 - properties of living and nonliving things should be changed to characteristics of living and nonliving things.	yes	standard		consider revising K.L1U1.5 adding the words "information about" how the human body... "properties" is an appropriate scientific descriptor.
1545	Stated above.	no			
1546	Put evolution back in, it is science.	no	evolution		see comment 1001
1547	Removal/replacement/minimizing evolution is completely unacceptable.	no	evolution		see comment 1001
1550	The first standard of the life science is extremely vague with little direction. The language seems developmentally inappropriate and doesn't have much guidance for teachers.	no	comment		too broad
1553	See above	no			

1556	Remove all religious references.	no	religion		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	religion		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	evolution		see comment 1001
1595	Hey here is a thought: Let's talk about climate change! Communicate solutions that will reduce the impact of humans on living organisms and non-living things in the local environment.	no	standard		2nd grade standard
1603	Actual SCIENCE would help. NOT RELIGION.	no	religion		
1628	Teach Science and facts in Schools not faith and religion.	no	religion		
1641	N/A	no			
1645	No comment.	no	comment		
1660	Fix evolution standards.	no	evolution		see comment 1001
1664	See comment #9	no			
1672	See first comment	no			
1678	Pure foolishness	no	comment		too broad
1681	N/a	no			
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.	no	evolution		see comment 1001
1694	Only facts based on repeatable scientific tests.	no	comment		too broad
1739	As I mentioned in Question 15, I would like to see changes made to the way evolution is described in the Draft	no	evolution		see comment 1001
1793	Please do not muddy the language regarding evolution	no	evolution		see comment 1001
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.	no	evolution		see comment 1001
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	evolution		see comment 1001
1799	Teach Evolution, not Creationism	no	evolution		see comment 1001
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	yes	comment		revision in progress
1811	Revert all of Diane Douglas's changes.	yes	comment		revision in progress
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	evolution		see comment 1001
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations.	no	comment		too broad
1892	Evolution is all there is.	no	evolution		see comment 1001
1900	Children love these subjects. Make it interesting.	no	instruction		
1918	Refer to my response to question 17.	no			
1926	Darwin please.	no	evolution		see comment 1001

1929	K.L1U1.5 It says 'Obtain, evaluate, and communicate how the human body has different systems that carry out life processes.' - this wording leaves some to be desired, and we are not shown what previous wording was. You presumably mean 'obtain information about'? What are kindergardeners supposed to do to 'evaluate'? Are they evaluating the information about the human body, or evaluating the systems of the human body? What value is being measured here?K.L2U2.6 'air, food, water, energy' are not 'properties of non-living' things. This needs at least rephrasing but also clarification. Air is a non-living thing, but what are kids now learning about how it is different from living things?K.L4U2.7 Key concepts listed bear no relationship to the topic of the standard.K.L2U2.6 and K.L4U2.7 both remove the term 'observe' - why? Observation, particularly careful, thorough observation, is one of the most important skills as scientist and anyone who seeks to understand and evaluate evidence. Information does not come from asking questions and explaining alone - information is actually gathered by careful observations (or researching sources).	yes	standard		First part of comment addresses curriculum and instruction. revise standard K.L2U2.6 and K.L4U2.7 to add the word "observe" back in.
1941	Specifically Charles Darwins theory of evolution must be taught. It forms the foundation of life science scientific inquiry. By not teaching Darwins theory of evolution you diminish the quality of education for our children.	no	evolution		see comment 1001
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.	no	evolution		see comment 1001
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.	no	evolution		see comment 1001
1953	Teach proper evolution	no	evolution		see comment 1001
1955	scientific method critical for those inclined to medicine, biology	no	comment		too broad
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	evolution		see comment 1001
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no	comment		too broad
2013	STOP calling Evolution a theory. It is not, and it is wrong to spout such nonsense.STOP thinking that everything has both a positive and negative effect - those are often subjective concepts and should be removed from the document.	no	evolution		see comment 1001
2015	Ambivalent.	no	comment		
2020	Introduce evolution	no	evolution		see comment 1001
2030	L4	no			
2032	Evolution	no	evolution		see comment 1001
2036	As above.	no			
2043	All standards need to be included.	no	comment		too broad
2062	Evolution as scientific fact instead of Creationism needs to be added back.	no	evolution		see comment 1001
2079	The science of evolution.	no	evolution		see comment 1001
2093	See above.	no			
2111	See previous comments on the treatment of evolutionary biology.	no	evolution		see comment 1001
2112	Emphasis on observation!	no	instruction		
2127	I have not read the full draft, so have no comment on this	no	comment		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	evolution		see comment 1001

2156	K.L1U1.5 Human body systems is not a part of the Framework or the Working with Big Ideas for this standard. Delete. This should be included in Health Standards.K.L2.U2.6 - Delete properties, insert characteristics. Living and non living organisms do not have properties; they have characteristics.	yes	standard		consider revising or deleting standard K.L1U1.5
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.	no	evolution		see comment 1001
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	evolution		see comment 1001
2210	Evolution must be taught.	no	evolution		see comment 1001
2259	Send the standards back for review.	Yes	comment		under revision
2262	Explain evolution.	no	evolution		see comment 1001
2265	Include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .	no	evolution		see comment 1001
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	no	religion		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no	comment		
2314	Sex education should begin at this age including awareness of other's (LGBTQ ect) and to remove stigma of sex and masturbation. Research shows that toddlers and people of all ages masturbate and repressing this and sexual orientation and gender identity has a strong correlation to mental health issues in adults.	no	comment		see Health Standards
2345	Refer reply in 20 above.	no			
2354	.....	no			
2360	Children in Kindergarten should be introduced to basic concepts in evolutionary theory.	no	evolution		see comment 1001
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	other		see comment 1303
2372	Consider that these are 6 year olds and the information needs to at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.	no	comment		scientific vocabulary is included
2378	Needs to go back to review.	yes	comment		revision in progress
2380	Keep religious beliefs out of science standards.	no	religion		
2384	Climate change and evolution must be adopted as standard curriculum.	no	evolution		see comment 1001
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	evolution		see comment 1001
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	evolution		see comment 1001

2428	Stick to actual science and stop dumbing down our children!	no	comment		too broad
2487	N/A	no			
2515	Keep religion out of it!!!!	no	religion		
2518	I couldn't care less about Kindergarten.	no	comment		
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	evolution		see comment 1001
2539	N/A	no			
2607	Do not attempt to deny or water down the concepts of evolution.	no	evolution		see comment 1001
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	evolution		see comment 1001
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.	no	evolution		see comment 1001
2642	Put back in the word observe . At this age, learning to make proper observations is key.	yes	standard		add "observe and ask questions" to life science standards K.L2U2.6 and K.L4U2.7
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.	no	Instruction		

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	21. What would you like the working group to consider as they revise the First Grade 2018 DRAFT Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	No			
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			
124	n/a	no			
143	I question if conceptually first graders can plan and carry out investigations. I believe that they can investigate different phenomena however I do not think that they are conceptually able to plan their own investigation at this age.	yes		Keep as is	Include the learning progression from A Framework for the SEP's that delineate the expectations for the SEPs at grade band as a resource or appendix
145	Put back in 'In this grade level, students learn how objects can impact other objects from a distance or by contact with each other, how organisms interact with Earth, and how life systems have cycles.	Yes	1.p3.u1.3, 1.l1.u1.6, and 1.l2.u1.8	Keep as is	The current draft standards address these concepts as written.
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No			
162	Adopt NGSS standards	no			
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			
170	Funding	no			
185	would like a check list to be able to follow along	no			
189	A more clearer perimeters to teach within.	no			
193	Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked.	yes			Assessment boundary or learning progression could be added to provide clarity of standard
197	Make sure the first grade standards continue to build on the kinder standards.	no			
203	The Key concepts should be dropped from every grade level.	no			
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
251	Allow students to think critically throughout each standard of the lesson.	no			
252	What resources are available to teach these standards	no			
265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	yes		see comment Kinder Q16 - 265	
269	Is this too much for first grade? It seems heavy in extensive, important concepts. Take a second look to consider.	no			
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
322	Make the connections to the health standards more clear	no			
326	Wait to Test.	no			

335	No suggesstions	no			
352	The standards work for the grade level.	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
433	Not specific enough. Too broad and can leave too much interpretation for later grade levels to struggle with	no			
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	no			
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	evolution		Does not pertain to this grade level. L4 addressed at K level focuses only on how plants and animals respost to their environment.
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	evolution		see comment 1001
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	evolution		see comment 1001
1091	A first grader's level of understanding of the Theory of Evolution.	no	evolution		see comment 1001
1092	Without ADE additions, this would be a strongly agree.Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally , many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove they key concepts column from the document. if ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for 1.P3U1.3 Follow this process for each of the first grade standards, not just the example below.Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: With guidance, plan and conduct an investigation in collaboration with peers. Scientists use different ways to study the world. Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. When objects touch or collide, they push on one another and can change motion. A bigger push or pull makes things speed up or slow down more quickly. Simple tests can be designed to gather evidence to support or refute student ideas about causes.	yes	organization		key concepts are being revised

1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	evolution		see comment 1001
1148	Evolution is not a theory.	no	evolution		see comment 1001
1165	No comment	no	comment		
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.	no	evolution		see comment 1001
1171	Only SCIENCE in Science class!	no	comment		too broad
1186	See kindergarten comments.	no			
1196	Actual science standards	no	comment		
1219	Get rid of intelligent design. Restore references to evolution.	no	evolution		see comment 1001
1221	Make them more understandable	no	comment		too broad
1222	Not utilize language in re Darwinism, natural selection or evolution.	no	evolution		see comment 1001
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	evolution		see comment 1001
1226	Don't revise.	no	comment		
1278	Consistently omits the focus on investigating and justifying using evidence to support hypothesis.	no	comment		too broad
1298	Creationism and intelligent design are okay for churches, not for public education. Do you think that I can study through medical school if I learned intelligent design?	no	religion		
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	other		AZ Board of Education directive
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.	yes	organization		under revision
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	other		see comment 1303
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	evolution		see comment 1001
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	standard		under revision
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no	comment		
1339	Clearly include teaching the concept of evolution.	no	evolution		see comment 1001
1366	Original language should remain	yes	comment		under revision
1403	Teach evolution. Evolution is science.	no	evolution		see comment 1001
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.	no	religion		
1443	evolution should be included in all grades	no	evolution		see comment 1001
1517	Bring back the word evolution.	no	evolution		see comment 1001
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	evolution		see comment 1001
1526	Climate change should be included in any physical science or earth science class.	no	standard		2nd grade standard

1538	If first grade is supposed to be about cycles, why do the Earth science standards focus on properties of Earth materials? Maybe add a cross-cutting concept focus that addresses properties of materials, such as energy and matter.				
1547	Removal/replacement/minimizing evolution is completely unacceptable.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1672	See first comment				
1681	No issues. Seems appropriate.				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.				
1793	Please do not muddy the language regarding evolution				
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	The sooner kids learn about real science, the better off they will be.				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1886	See above				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the scientifically proven models of evolution and Darwinism.				
1892	Keep the science in science. Looking toward religious groups is moronic.				
1914	Start teaching the fundamental of evolution.				
1918	See my comments				

1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.				
1923	They're in first grade. Some of your standards seems more appropriate for 2nd or 3rd.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1953	Teach proper evolution.				
1955	Critical thinking; must know that there something it is called Science				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	On pg 13, first paragraph, unnecessarily restricts concepts. What is wrong with survival as a concept? On pg 14, what is wrong with evaluating habitats? Also, groups are classified by differences as well as by similarities.				
2015	Introduce more scientific concepts. Elaborate upon scientific theory and philosophy.				
2030	L4				
2032	Evolution				
2036	as above.				
2043	All standards need to be included.				
2062	No comment.				
2079	Science.				
2093	See item 24.				
2096	Add science that is also social science. Anthropology, archaeology, sociology, human development etc				
2115	No specific recommendations for this level				
2127	I have not read the full draft, so have no comment on this				
2146	There are some concepts that may be difficult for first graders to grasp. The working of the standard should be looked at in order to make it friendly for the students and teacher.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				

2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2292	Please consider removing 1 P2u2.2 and 1 L3u2.9, these concepts are too complex for first graders. First graders don't need to start thinking about genetics yet!				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2314	See kindergarten sections				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards.				
2384	Include all commonly adopted science standards.				
2387	Please consider what is developmentally appropriate and develop their natural curiosity.				
2410	Don't teach first, sorry!				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2465	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.				
2471	evolution rather than theory of				
2487	Restore 1.L4U4.11 to original terminology.				
2515	see above				
2518	I couldn't care less about First Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2529	Include health standard that includes body awareness				
2539	How are key concepts different than vocabulary lists, as they could be focused on in that way leaving out inquiry entirely. In 1.L4U4.11 is argument and evidence of authors claim taught as a 1st grade ELA skill? If not this would be difficult to do just in science.				
2582	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				

2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	This section is good				

Survey Question	22. What would you like the working group to consider as they revise the Physical Science Standards in the First Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
89	No comment	no			
114	n/a	no			
124	n/a	no			
143	I question if conceptually first graders can plan and carry out investigations. I believe that they can investigate different phenomena however I do not think that they are conceptually able to plan their own investigation at this age.	yes		See comment Q21-C143	
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
189	A more clearer perimeters to teach within.	no			
197	Be specific with language.	no			
208	Simplification.	no			
250	should offer key concepts to include instead of saying refer to standard	no			
252	good	no			
265	Page 13 Remove Key Concepts Column Under 1.P2U1.1 - what did the green type replace - will 1st grade really plan investigations, or just carry them out? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes		See Comment Q21-C143	
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	no suggestions	no			
352	They need more clarification.	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	no			
550	nothing	no			

1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A first grader's level of understanding of the Theory of Evolution.				
1092	Standard 4. Solutions is an inappropriate term that implies that friction is a problem that needs to be solved. Ways is the correct term.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1186	See kindergarten comments.				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 1st.				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include teaching the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono OOdham, etc. For example,in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				

1526	Climate change should be included in any physical science or earth science class.				
1538	1.P4U3.4 - This standard seems too abstract for 1st grade. It seems like this standard was just added to try to include a P4 standard for 1st grade when maybe this idea should not be addressed until later. I could see a standard related to solutions to increasing or reducing friction to make an object move faster or slower because it fits better with 1.P3U1.3 and is less abstract.				
1547	Removal/replacement/minimizing evolution is completely unacceptable.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	I would like to see these standards blend together better so it would be easier for the teacher to teach them. The physics concept could be taught in 2nd grade for example. For teh engineering design process: whet not have students think about how they can use light and sound to solve problems?				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	N/a				
1694	Only facts based on repeatable scientific tests.				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationis				
1886	See above				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1892	It is the same for every grade. Improve science; don't make it worse.				
1918	Refer to my response to question 17.				
1953	Teach proper evolution				
1955	Critical thinking; must know that there something it is called Science. scientific method				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				

2062	No comment.				
2079	Science from real scientists.				
2093	See item 24.				
2127	NO teaching of intelligent design or creationism in any classroom! Religious instruction belongs at home.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about First Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	When are simple machines introduced as a concept? I see they are to be used in design but without a supporting standard or sub standard to introduce them.				
2559	These physical science standards lack continuity, I understand the theme of causal relationships, but the reality of having materials for these isolated experiences is unrealistic.				
2607	Do not attempt to deny or water down the concepts of evolution.				

2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	This section is good				

Survey Question	23. What would you like the working group to consider as they revise the Earth and Space Science Standards in the First Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
89	No comment	no			
114	n/a	no			
124	n/a	no			
143	no comments	no			
145	Develop and use models about how living things use resources to grow and survive; TAKE OUT design and evaluate habitats for organisms using earth materials. Changes the whole meaning of this- take it out	Yes	1.12.u2.7	Make additional standard for "Design & evaluate habitats for organisms using earth materials" under Life Sciences OR move that statement back to the original standard (1.E1.U1.5 where it was prior to internal review) "Use earth materials to design and evaluate suitable habitats for organisms."	Is the focus on habitats or the focus on earth materials
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
189	A more clearer perimeters to teach within.	no			
197	Include a lot of experiments that are inviting and interesting for students.	no			
252	good	no			

265	Page 14Remove Key Concepts Column	no			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	no suggestions	no			
352	We like the standards!	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	no			
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	no			
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1031	Climate change needs to be included				
1050	Page 14, 1.E1U1.5: While it is important to 'Obtain, evaluate, and communicate,' the removal of the word Investigate implies that a student can just 'obtain' this information from a book or the Internet and not carry out their own investigations which is critical for real understanding				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A first grader's level of understanding of the Theory of Evolution.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1186	See kindergarten comments.				
1196	Climate change				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 1st				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1245	I would like them to use newst time line dates for varied rock formations.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				

1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change should be included in any physical science or earth science class.				
1547	Removal/replacement/minimizing evolution is completely unacceptable.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	These seem to be lacking a lot! There is only one standard?				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	N/a				
1694	Only facts based on repeatable scientific tests.				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1877	Evolution				
1886	See above				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1918	Refer to my response to question 17.				
1948	we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.				
1953	Teach proper evolution				

1955	Critical thinking; must know that there something it is called Science. scientific method				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	Science from real scientists				
2093	See item 24.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	From the Life Sciences (1.L2U2.7) - Create a standard that states: Using earth materials, design and evaluate a habitat for organisms.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				

2465	The way it is worded is more of a life sciences standard. The Framework suggests Earth science ideas of events on Earth (pg. 178). More closely related to the way in which the current draft reads, the Framework has the concept that wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things. (pg. 180)				
2487	N/A				
2515	see above				
2518	I couldn't care less about First Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2559	1.E1U1.5 This standard no longer represents the intersection indicated in the coding. The Core Idea is about how materials on Earth change based on natural and human processes. This standard is now memorization/fact recall and regurgitation. E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	This section is good				

Survey Question	24. What would you like the working group to consider as they revise the Life Science Standards in the First Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
56	1.L4U4.11 - this exact standard is found in the 4th grade standards, 4.L4U4.12	yes	1.L4u4.11	keep the same	Although same as 4th grade, the actual learning progression from Framework & Big Ideas provide the assessment boundary for the content in the standard
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			
124	n/a	no			
143	1.L4U4.11I don't think that the addition of or entire species is necessary. Based on my understanding or extinction if an organism is extinct then that species is also extinct.	yes	1.L4u4.11	remove the phrase "or entire species"	

145	11.4U2.10 Classification of vertebrates and invertebrates is again developmentally inappropriate. Gets wordy when adding positively and negatively all over the place. When discussing impacts it is implied that you would discuss both.	yes	11.4u2.10	Change wording to possibly "Develop a model to describe how plants and animals are grouped by characteristics"	committee is considering this, Classifying animals/plants into vertebrate/invertebrates is beyond grade level; however, in Framework animals/plants exist in different places in land and in water
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
189	A more clearer perimeters to teach within.	no			
208	Simplification.	no			
252	good	no			
265	Page 14 Remove Key Concepts Column Under 1.L2U2.7 - remove 'design and evaluate habitats for organisms using earth materials.' - it is repetitive of what the teachers have in the first part of the sentence. Remove 1.L4U2.10 - since it is in green, the teacher's did not indicate that this is a standard that should be taught at the 1st grade level. Under 1.L4U4.11 - remove 'or entire species' - the term 'organisms' covers it - so this addition is repetitive. Renummer to 4.10 (see comment on 4.10 above.)	yes	1.12u2.7; 1.14u4.11, 1.14u4.10	, see comment Q23 - 145; see comment 143 above; see comment above	
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
326	Wait to Test.	no			
335	no suggestions	no			
352	Instead of the word argument use the word discussion. Instead of using the word organisms use the words animals and plants to make it consistent through out all the standards.	yes		Keep as is	To be consistent with the wording in the Framework and Big Ideas, both "plants and animals" and "organisms" should be used
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			Committee is considering this
435	N/a	no			
472	The evolution and genetic information standards should be kept in elementary grades, however they are likely too abstract for 1st and 2nd grade. I have extensive experience teaching these concepts to older students and am basing this suggestion on my experience, as well as my content and pedagogical knowledge. These concepts would be much more appropriate for 3rd or 4th grade.	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes			Committee is considering this
550	nothing	no			
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1031	Include evolution				

1081	1.L4U2.10 under key concepts should refer to Kingdoms as a fundamental concept, as invertebrates are not organisms lacking backbones, they are animals lacking backbones. So what is an animal?				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A first grader's level of understanding of the Theory of Evolution.				
1113	We need to start teaching children about all aspects of life including evolution from the very beginning.				
1147	I'd like the kids, at this age, to 'use evidence' not 'engage in argument.' I'm sure the intention was to imply critical thinking, but it represents a standard for challenge. Using evidence involves thinking critically to research, support and defend an article.				
1148	Evolution is not a theory.				
1164	1.L3U2.9, and the identical standard in grades 5 and 8 ignore that some plants, notable two important desert plants, creosote and agaves, can also reproduce through cloning, producing plants that are genetically identical to the parent plant.				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1186	See kindergarten comments.				
1190	Environmental studies should include information regarding human impact.				
1196	Evolution				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 1st				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1305	Engage in argument from evidence to support a claim about the factors that cause organisms or entire species to go extinct and analyze how humans can positively or negatively impact those factors. When an organism becomes extinct, it is the entire species that goes extinct. It is not necessary to add or entire species as scientists realize this fact.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				

1338	This applies to the Distribution of K-2 standards - page 20:' L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.'This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1413	Evolution should be presented as proven theory backed by vast amounts of physical data. Cratationism has no place in science curriculum even as an alternative theory.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example,in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1500	They need to start learning about where they and everything came from, via evolution				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Evolution should be included in any life science or biological class				
1538	1.L4U4.11 - Organisms die but do not go extinct. Species go extinct.				
1546	E				
1547	Removal/replacement/minimizing evolution is completely unacceptable.				
1553	This is redundant.				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	Engage in argument from evidence to support a claim about the factors that causeorganisms or entire species to go extinct and analyze how humans can positively ornegatively impact those factors.How about including something where students are working to create something that may help to solve these problems?				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				

1664	See comment #9				
1672	See first comment				
1678	An attack on the hard work and mountains of evidence-based study to support a delusion				
1681	N/a				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Only facts based on repeatable scientific tests.				
1739	I would like to see the phrase the theory of evolution taken out of the standards and replaced with the word evolution				
1793	Please do not muddy the language regarding evolution				
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1918	Refer to my response to question 17.				
1923	Metamorphosis may be a hard concept for someone who is 5 or 6 years old.				
1926	Darwin please.				
1941	Teach Charles Darwin theory of Evolution.				
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1948	we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.				
1953	Teach proper evolution				
1955	Critical thinking; must know that there something it is called Science. scientific method				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	STOP calling Evolution a theory.				
2015	More on evolution.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	Evolution needs to be added back in as fact.				

2079	Science from real scientists.				
2093	See item 24.				
2111	See previous comments on the treatment of evolutionary biology.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Delete 2nd part of 1.L2U2.7 -- the combination of those two big ideas need to be separated. Or rewrite the standardDelete 1.L4U2.10 -- this concept of classifying goes with Kindergarten where they are observing characteristics of living and non-living.Standard 1.L4U4.11 is almost exactly written as the 4th grade standard. My want to change delete species and keep only organisms. Including the learning progressions from A Framework (pg. 165) would help determine how far to go with this concept (assessment boundary)				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2210	Evolution must be taught.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2416	If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.				

2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	Restore 1.L4U4.11 to original terminology.				
2490	Discussion of offspring not being identical to their parents, classification of organisms, and species extinction are age-inappropriate. Discussion of topics related to inheritance and evolution should be delayed until later grades.				
2515	Keep religion out of it!!				
2518	I couldn't care less about First Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2559	1.L2U2.7 The green portion is not a life science concept. This standard is repeated in 2nd grade				
2605	The changes proposed to L4.U4.11 seem totally misguided. Use evidence to support is science. Engaging in arguments is not what science is about, seeking explanations for the evidence is the key. Please change this wording back to what it was.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
2642	this section is good				
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.				

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	26. What would you like the working group to consider as they revise the Second Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			
124	n/a	no			
143	Most are good.	no			
145	AGAIN PLEASE return to the original: By the end of second grade, students understand the basic concept that energy can change phase and is necessary for life. In this grade level, students will understand how energy flow and matter cycling is seen in the interactions with the surface features of Earth, water cycles, and the environment.	Yes	intro to standards		Depending upon the key concept column, this concern maybe addressed in another venue
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			
170	Funding	no			
172	take out the interpretation (standard 7) of how changes in land and water impact humans. rather focus on the facts of how the land and water on earth moves naturally: the natural processes that have been going on here even before man was around.	Yes			This statement is reflected in standard 2.e1u4.4
181	Standards should be listed in level of importance. Some standards are interdependent, but the depth of knowledge is still too great to cover them all.	no			
185	i fell its very vague and broad ... need more specific	no			
189	A more clearer perimeters to teach within.	no			
191	More specific information for the elementary level; examples, etc.	no			
193	Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked. It is too broad and vague.	yes			This could be addressed with assessment boundaries/learning progressions
203	The Key concepts should be dropped from every grade level.	yes			Committee is considering
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
251	Allow students to think critically throughout each standard of the lesson.	no			
252	N/c	no			
265	Page 9, 21, 33 Remove last sentence: 'Suggestions for key concepts...or maximum content limits.' Pages 12, 15, 19, 24, 28, 31, 37, 41, 45 Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	yes			
269	I was confused because in the third grade standards it references that second grade would cover body systems. I know these were in the old standards but did not see where they were in the new standards. Are they missing? Should the basics be there?	yes			
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			

334	I noted all of the items I felt were missing from the standards on a previous question.	no			
335	no suggestions	no			
347	The earth and space sciences seem unequally covered compared to life and physical science. Reduce Earth & Space standards (too many with a vast amount of concepts) and increase Life Sciences (more applicable to primary grades.)	yes			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			committee is considering
433	Same as first. The problem for middle school and high school teachers is not enough consistency at elementary level. Standards need to be more precise.	no			
435	N/a	no			
455	Key concepts: I would like to see a little more detail in each category so I know that I am addressing all the points this standard entails.	yes			committee is considering
472	Keep the environment-related standards. Also, preserve the argumentation from evidence aspects in the K-2 standards.	yes		keep as is	
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes			committee is considering
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1020	8. Page 20, Table Heading labeled U1 "see comment 19 - #5.9. Page 20, Table Heading labeled U4 "see comment 19 - #6.				
1081	There is not enough life science being taught in the second grade.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A second grader's level of understanding of the Theory of Evolution.				

1092	Without ADE additions, this would be a strongly agree. Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally , many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove the key concepts column from the document. Key ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for 2.E1U3.5 Follow this process for each of the second grade standards, not just the example below. Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: Develop a model to represent patterns in the natural world. Scientists search for cause and effect relationships to explain natural events. Maps show where things are located. One can map the shapes and kinds of land and water in any area. Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. Events have causes that generate observable patterns Patterns in the natural world can be observed. Things may change slowly or rapidly.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard				
1131	In the introduction sky needs to be changed back to environment .				
1148	Evolution is not a theory.				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1196	See above				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 2nd				
1222	Not utilize language in re Darwinism, natural selection or evolution.				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1298	Eliminate intelligent design, creationism - belongs in church.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				

1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono OOdham, etc. For example,in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1517	Bring back the word evolution.				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Evolution should be included in any life science or biological class				
1548	L4, see comments from previous				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	No issues. Seems appropriate.				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the scientifically proven models of evolution and Darwinism.				
1914	Continue teaching evolution.				
1918	Refer to my response to question 17.				

1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1953	Teach proper evolution				
1968	I like that evolution was mentioned.				
1990	Evolution must continue to be taught				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	The use of the word transformation (pg 16, 1st paragraph) has religious connotations and should be changed back to phase change which is a scientific concept.				
2015	Introduce more scientific concepts. Encourage the development of simple hypotheses and experimentation.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2093	See item 24.				
2096	Add social science				
2115	No specific recommendations for this level				
2127	I have not read the full draft, so have no comment on this				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				

2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards.				
2378	These are not.				
2380	Needs to go back to review.				
2384	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2387	Please revise.				
2410	Please consider what is developmentally appropriate and develop their natural curiosity.				
2419	Don't teach 2nd, sorry!				
2428	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2465	Stick to actual science and stop dumbing down our children!				
2471	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.				
2487	evolution rather than theory of				
2515	N/A				
2518	see above				
2520	I couldn't care less about Second Grade.				
2529	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	Include health standard that includes body awareness				
2543	General question; where any of the national standards looked up as purchasing materials that align with content and grade level will be difficult for districts unless Arizona Dept of Ed is planning to publish these.				
2582	TEACH EVOLUTION!				
2605	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.				
2607	Please do not use the word formerly with the scientific method . There is a distinct difference between engineering practices and the scientific method. The one is NOT a substitution for the other and formerly is wholly inappropriate here.				
2615	Do not attempt to deny or water down the concepts of evolution.				
2618	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2642	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
	This section is good				

Survey Question	27. What would you like the working group to consider as they revise the Physical Science Standards in the Second Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
89	No comment	no			
114	n/a	no			
124	n/a	no			
143	I am concerned with the word transform, is there a reason for changing it from phase change to transformation? I think we need to make sure we choice our words carefully so that we do not encourage misconceptions to me taught.	yes			
145	Change all transformation to phase change- make the language universal not one program specific. I work with many students across the nation and Core Knowledge may use this terminology but it is not common.	yes			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
181	Order of importance and where they will be getting all the prior knowledge to these concepts from. They are written as if expected to already know about the vocabulary and concepts that they need to know to introduce these. Also, if we are just now implementing these, how do we help the students that didn't learn all of these topics this year? Where is the reteach?	yes			
185	more specific areas that they want talked about	no			
189	A more clearer perimeters to teach within.	no			
191	Same! More specifics. We are not exclusively science teachers and need more examples of what these standards mean.	no			PD & curricula
208	Simplification.	no			
252	n/C	no			
265	Page 16Remove Key Concept ColumnUnder 2.P1U2.2 - what did the 'transformation (solid, liquid, gas)' replace? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
334	Looks good	no			
335	none	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			committee is considering
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes			committee is considering
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1020	Page 20, Table Row labeled P4 - see comment 19 - #3.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A second grader's level of understanding of the Theory of Evolution.				

1092	Standard 2.Phase change is the correct term.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1186	See kindergarten comments.				
1196	See above				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 2nd				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise. Don't revise.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example,in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1538	2.P1U2.2 should read Plan and carry out investigations to gather evidence to support an explanation on how heating or cooling transforms matter (solid, liquid, gas).2.P4U1.3 seems to address the same idea as 2.P1U2.2. I suggest eliminating 2.P4U1.3.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1595	From New York State Standards Construct an argument with evidence that some changes caused by heating or cooling can be reversed and somecannot.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	N/a				

1694	Only facts based on repeatable scientific tests.				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1918	Refer to my response to question 17.				
1923	Mass is a very difficult concept to explain to 2nd graders. I'd be worried that many elementary teachers will confuse mass and weight. This is NOT a misconception I'd like younger kids to grow up with.				
1948	we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.				
1953	Teach proper evolution				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2093	See item 24.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				

2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about Second Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2543	TEACH EVOLUTION!				
2559	2.P1U2.2 Phase change is the appropriate scientific terminology and should be used.2.P4U1.3 Thermal energy not heat energy.How are these standards teaching different concepts? A phase change IS a change in the object. Since the standard says heat, then any change other than a phase change is a chemical change. Is that what is being discussed here?				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
2642	This section is good				

Survey Question	28. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Second Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
89	No comment	no			
114	n/a	no			
124	n/a	no			
143	2.E2U1.8The words Earth's position in relation to need to be removed, this changes the meaning of this standard and makes it about the Earth's revolution around the sun and less about what is meant which is the Earth's rotation on it's axis. The Earth's position in relation to the Sun is very hard to observe in a 24 hour time frame.	yes			

145	2.E2U1.8 Wrong- change of wording changed meaning. The earth's position relative to the sun does not change in a 24 hour period. The sun may appear to travel across the sky in a 24 hour period but this standard does not state that.	yes			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
172	weather patterns are going to be hard for a second grader to understand and grasp. (standard 6)	no			
181	Where is the previous introduction to this information. In second grade are these topics expected to be continued from the point of introduction of the concept all the way to the depth of knowledge to conducting experiments and explaining why they are happening or important for our planet.	yes			Learning progression, specifically for the SEPS could be a resource or an appendix
189	A more clearer perimeters to teach within.	no			
191	See above.	no			
208	Simplification.	no			
252	n/c	no			
265	Page 17 Remove Key Concept ColumnUnder 2.E1U2.5 why were 'glaciers' added and '(water cycle) added? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes			
281	Nothing	no			
292	Nothing in particular.	no			
311	These are not what the committee created	no			
334	Add weather (as noted in previous questions) since it ties in with the water cycle and states of matter.	yes			
335	no suggestions	no			
347	Within the earth and space standards, there are many concepts to be covered. Consider redistributing the quantity of standards to a different grade level. Move 2E2U1.8 to 3rd grade (as it fits with that concept and they only have 1 Earth standard.	yes			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			committee is considering
435	N/a	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes			committee is considering
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1031	Climate change needs to be included				
1050	Page 17, 2.E2U1.8: The changes here are out and out bad and wrong! It is critical that students make their own observations (Sun motion and shadows, for example) and try to understand what they have seen, not just analyzing and interpreting data they are given. What has been added is wrong! The Earth's position has not changed much (revolution/orbit), it has rotated on its axis, two very different things. In the Key Concepts, while as an astronomer, I am happy for the students to eventually understand that the Sun is a star, I do not see where that comes from in the Standard as written.				

1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A second grader's level of understanding of the Theory of Evolution.				
1092	Standards 5. Adding water cycle distracts from broader understanding of where water is found and not just the phases. Standard 8. What data is being analyzed? The observations (original wording) that students are making?				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard				
1165	No comment				
1167	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1171	Only SCIENCE in Science class!				
1186	See kindergarten comments.				
1196	See above				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Don't teach 2nd				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1264	Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1449	2.E2U1.8 concerning rotation, revolution, axis, sunrise, sunset, sun is a star are big concepts which are not grade level appropriate for 2nd graders in my opinion				
1464	This is where you should introduce tectonic plates. Explain the creation of mountains and valleys and then demonstrate how water takes advantage of this and wind. Don't teach them the parts of the tectonic plates yet but explain that we're on plates.				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Earth and Space Sciences without big bang cosmology and climate change is woefully inadequate.				

1538	2.E1.U2.5 - Include that water is found underground and also in life forms (e.g. plants and animals). Note: the addition of water cycle is appropriate because as worded, this standard does not address that water cycles or the processes for how it moves from one place or state to another. 2.E1U4.7 - Changes in water or land systems happen all of the time and by themselves are not positive or negative; they are only perceived as positive or negative with respect to what they impact. Therefore, change the wording to Construct an argument from evidence about how changes in water and land systems can have positive and negative impacts on humans and the environment. 2.E2U1.8 - For 2nd grade, changes in the sky should be limited to day and night and not on the phases of the moon. Also, it is not the relative position of the Earth and sun that cause day and night, but the rotation of the Earth. Suggested revision: Analyze and interpret data to explain patterns in day and night.				
1550	The I kid ok of erosion in 2nd grade seems delevipmebtally inappropriate and does not seem to have any continuity with the previous or forthcoming grades. This is traditionally taught in 4th grade through NGSS standards.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	Develop and use models to represent that water can exist in different states and is found in oceans, glaciers, lakes, rivers, ponds, and the atmosphere (water cycle). - What are the effects when these stages change? This just seems to be thrown in: Analyze and interpret data to explain the Earth's position in relation to the Sun at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	N/a				
1694	Only facts based on repeatable scientific tests.				
1699	Climate change should be included - keep environment				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1877	Evolution				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1918	Refer to my response to question 17.				
1923	2.E1U3.6 and 2.E1U3.8 seem too advances for 2nd grade.				
1948	we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.				
1953	Teach proper evolution				

1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2093	See item 24.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Caution: The insert of water cycle in 2.E1.u2.3 leads one to having students memorize the water cycle chart. The intent of the standard is that students should be able to identify where water is found on Earth and that it can be solid or liquid -- not that it cycles. Delete water cycle 2.E1U2.5 Key Concepts -- if terms are kept delete insert climate change				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about Second Grade.				

2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2543	TEACH EVOLUTION! TEACH EVOLUTION!				
2559	2.E1U3.6 How will students in 2nd grade test solutions to protect themselves from severe weather conditions? Will they be subjected to hurricane strength winds, severe drought, blizzard conditions, etc?				
2605	Science is about observation and explanation. Please do not change the wording to analyze and interpret, this seems to change the focus to making things up rather than observing which is the core of science. The words observe and experiment should feature prominently.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	This section is good				

Survey Question	29. What would you like the working group to consider as they revise the Life Science Standards in the Second Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	no			
54	The life cycle units are needed. The human body is great for second grade and very grade appropriate. If you want students to observe what heat does to matter, are you going to provide materials for experiments etc?	yes			
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			
124	n/a	no			
143	no concerns	no			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
181	They're mostly gone and this is what our kids love learning about at this age level. We would rather incorporate the standards around these skills to teach the students why it is important to take care of the planet and what will happen to the animals if we continue to cut down trees and ruin habitats. It helps the students put it into perspective and with their informational writing. Other concepts are still too abstract for this.				
189	A more clearer perimeters to teach within.				
191	See above.				
208	Simplification.				
252	n/c				
265	Page 18 Remove Key Concept ColumnPage 20In cell L1, U1, Remove the standard removed in comments above: K.L1U1.5.In cell L4, U2, Remove the standard removed in comments above: 1.L4U2.10.In cell L4, U4 - renumber 1.L4U4.11 to 10.				

	Adding in some human body systems. These kids may never get another chance to learn about their bodies. I would like to see digestive, cardiovascular, and reproductive systems added as these are things that can effect their health and well being.				
275	Nothing				
281	Put back insects (which appears to be in 1st now)				
284	Nothing in particular.				
292	These are not what the committee created				
311	Add the body systems back in				
334	no suggestions				
335	Second grade could absolve some of the first grade standards such as 1.12U1.8 because it lends itself to the already existing second grade standards.				
347	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
390	N/a				
435	Move the genetics and evolution standards to 3-4th grade. It is too abstract for earlier grades.				
472	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
512	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1001	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1008	The inclusion of evolution must be reinstated.				
1017	Page 20, Table Row labeled L4 - see comment 19 - #4.				
1020	Evolution needs to be taught				
1031	There is insufficient life science listed to be taught in second grade. Balance of nature is a discredited concept that should not be taught. There is not a single balance point for each ecosystem, rather there are successional trajectories that vary with each system.				
1081	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1085	A second grader's level of understanding of the Theory of Evolution.				
1091	We need to start teaching children about all aspects of life including evolution from the very beginning.				
1113	Just 'Evolution,' it is NOT a theory.				
1147	Evolution is not a theory.				
1148	No comment				
1165	That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.				
1167	Only SCIENCE in Science class!				
1171	See kindergarten comments.				
1186	Environmental studies should include information regarding human impact.				
1190	See above				
1196	Get rid of intelligent design. Restore references to evolution.				
1219	Don't teach 2nd				
1221					

1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.				
1296	Evolution should not be omitted from this curricula.				
1298	Eliminate creationism, intelligent design. We get enough of this in church. Prepare the kids for college/trades schools with science.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1338	This applies to the Distribution of K-2 standards - page 20:' L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.'This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'				
1339	Clearly include the teaching of the concept of evolution.				
1348	Comprehensive sex education is desperately needed in AZ schools.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1426	If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example,in the Maya creation myth, humans are created out of corn.				
1443	evolution should be included in all grades				
1500	They need to start learning about where they and everything came from, via evolution				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Evolution should be included in any life science or biological class.				
1538	2.L2U1.10 - All energy ultimately comes from the sun. Therefore, it is unnecessary to state that life on Earth depends on energy from the sun and energy from other organisms. In fact, plants do not need energy from other organisms because they convert light energy from the sun into food energy. Simplify this standard to read Construct a model representing how life on Earth depends on energy from the Sun.				
1553	See above				
1556	Remove all religious references.				

1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1672	See first comment				
1678	Religion has no place undermining scientifically supported theory in SCIENCE CLASS				
1681	N/a				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Only facts based on repeatable scientific tests.				
1699	Evolution should not be omitted or referred to as theory.				
1739	Same as my earlier comments relating to removing the phrase the theory of evolution and keeping the single word evolution				
1757	Human factors on the environment should also be in this section.				
1787	The unity and diversity of organisms, living and extinct, is the result of evolution.				
1793	Please do not muddy the language regarding evolution				
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.				
1918	Refer to my response to question 17.				
1926	DARWIN please.				
1939	It is way too broad. The students that we are getting cannot possibly cover this much detail in a year long Biology class! I am National Board Certified and have taught for 16 years. Based on my experience, these standards will not lead to students grasping the all important Big Picture. It will get lost in the details. In addition, it is a serious mistake to not place evolution at the center of any discussion of modern biology.				
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1948	we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.				
1953	Teach proper evolution				
1968	More dinosaur dioramas!				
1990	Evolution must continue to be taught				

1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	STOP calling Evolution a theory.				
2015	More on evolution.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	Evolution needs to be added back in as fact.				
2079	see previous comments.				
2093	See item 24.				
2111	See previous comments on the treatment of evolutionary biology.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2210	Evolution must be taught.				
2252	An explanation of how life has evolved since living cells first populated the Earth must be included.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2416	If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.				

2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about Second Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2543	TEACH EVOLUTION!				
2605	Also changes to L4 seem inappropriate. L4 should read The unity and diversity of organisms, living and extinct, is the result of evolution, that is the current scientific consensus. Among scientists like myself there is no question that this is the overwhelming position, working in the word theory here is inappropriate and seeks to make clear has nothing to do with science and has no place in the wording here. I propose the following improved wording.L4. All observable evidence shows us how the unity and diversity of organisms, living and extinct, is the result of evolution				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	This section is good				
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.				

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	31. What would you like the working group to consider as they revise the Third Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Items Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	No			
89	No comment	no			
108	In 3.P2U1.1 in the key concepts it refers to characteristics of light such as speed. Are they really supposed to understand the speed of light at this grade level?	Yes	K-12 progression Key Concepts	Mirror the language on 135 of the K-12 Framework for Science Ed.	Agree with comment, speed is not developmentally appropriate.
114	n/a	no			
119	I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.	no			The task of the developers is to make sure that the standards are broad in effort to give local control more flexibility in decision making
121	lots of science standards have changed and moved around - will there be curriculum and funding to accommodate these changes?	no			see comment 119
124	n/a	no			
143	Consider the words being added to the Physical Science Standards, do these words change the standard from physical to life?	yes	standard	remove body parts 3.P2U1.1 3.P2U2.2	This is physical science standard; life standards are addressed later in the standards
145	The changes to page 21 are incorrect and lead to misconceptions - Return to original wording. We are not focusing on the sun but rather light and sound waves. PAGE 22 In this grade level, students apply their understanding of light waves; how they travel, are detected, and transfer energy to understand how light is a source of energy on Earth; how light and other waves travel, can be detected, and transfer energy; and how organisms can respond to light and other stimuli to increase their survival.	yes	grade level introduction	In third grade students develop understanding of cause and effect relationships involving energy and matter as they investigate properties of light and sound waves and the impact on organisms.	
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No			Committee should reconvene to make the adjustments to the public comment
162	Adopt NGSS standards	No			
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			see comment 157
170	Funding	no			
172	Really? how is a third grader supposed to construct an explanation ...regarding the sun and the energy it supplies the earth. Once again, students this age are need science they can see, touch and feel.	no	instructional		

183	The concepts do not seem to flow, it is random content thrown under one huge heading Physical Science .	Yes	organization		no change needed as all grade three standards focus on light and sound
184	I do not think that a third grader would find physical science engaging or interesting.	no			
185	need more specifics	no			
189	A more clearer perimeters to teach within.	Yes			Committee should consider assessment boundaries
190	The resources are the major concern and the physical science component is boring and not engaging.	no			
192	this is to broad we need more specifics	no			
193	Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked.	no			
203	The Key concepts should be dropped from every grade level.	yes			Committee is considering this within the bounds directed by ADE
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
218	Key Concepts should be expanded to provide more consistency in instruction across the state; with standards being broad, what is being taught may differ by site and location. How will testing be implemented without a better understanding of what is expected?	yes	standard	see comment 189	
224	Integrate computer science and EIE instruction.	no	instructional		Computer Science standards are being worked on
225	I would like the working group to look at the National Science and Technology Standards and base the standards on that.	no	standard		see 224
227	What is developmentally appropriate for 8 and 9 year olds to understandHands-on learning is very important for this age groupThird graders are highly verbal and enjoy working with partners and small groups	no			
252	n/c	no			
265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards. Page 21Remove additions by ADE: 'and between content areas' and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes	Key concepts and Connections to other content areas		see comment 203
269	Adding more detailed information in the key concepts sections.	no			not specific enough
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			

292	Nothing in particular.	no			
320	There needs to be resources given out if the students are to be taught this new information.	no			
326	Wait to Test.	no			
335	no suggestions	no			
369	Better explanation the Using the Science core ideas. The other 10 knowing are understable. Is it not clear in the verbiage of the standard to how to use the science.	yes	Appendix	Return the language to the Big Ideas document and clarify that 1- 10 is knowing and 11-14 is using science.	
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			See comment 203
512	Remove the wording and parts of the human ear isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes			See comments 143 and 203
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	standard		evolution was not removed from 3rd grade standards
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	see comment 1001			
1020	10. Page 21, 2nd paragraph see comment 19 - #2	no			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	see comment 1001			
1091	A third grader's level of understanding of the Theory of Evolution.	see comment 1001			

1092	This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands. Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally , many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove they key concepts column from the document. ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for 3.1.U2.6 Follow this process for each of the third grade standards, not just the example below. Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: Develop models to describe phenomena. Science findings are based on recognizing patterns. Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. Patterns of change can be used to make predictions.	1. connections 2. key concepts	1. other 2. key concepts	1. remove from standards	1. create supplemental document that can be updated as needed 2. comment agrees with proposal changes to key concepts.
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	see comment 1001			
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no			
1186	The teachers are not science teachers and will be concentrating getting the students to READ!	no			
1196	See above	no			
1219	Get rid of intelligent design. Restore references to evolution.	see comment 1001			
1221	They are to broad. We need more specific goals.	no			
1222	Not utilize language in re Darwinism, natural selection or evolution.	see comment 1001			
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	see comment 1001			
1226	Don't revise.	no			
1264	Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world.	no			science and engineering practices address this
1298	Same as before.	no			

1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards	none	ADE Directive
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.	see comment 203			
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	see comment 1303			
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	see comment 1001			
1315	Get a scientific expert to rewrite the content or undo the edits.	see comment 157			
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	see comment 157			
1339	Clearly include the teaching of the concept of evolution.	see comment 1001			
1366	Original language should remain	see comment 157			
1403	Teach evolution. Evolution is science.	see comment 1001			
1443	evolution should be included in all grades	see comment 1001			
1517	Bring back the word evolution.	see comment 1001			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	see comment 1001			
1553	See above	no			
1556	Remove all religious references.	see comment 1001			
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	see comment 1001			
1583	Adding and maintaining teaching Evolution needs to be continued.	see comment 1001			
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!	see comment 1264			
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	see comment 1001			
1628	Teach Science and facts in Schools not faith and religion.	see comment 1001			
1639	Students need MORE SCIENCE in every level!	no			
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	see comment 1001			
1664	See comment #9	no			
1672	See first comment	no			
1678	Light and sound should be taught as early as possible. I teach my 2 preschoolers about these concepts there's no reason to put it off.	no			
1681	No issues. Seems appropriate.	no			
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.	no			
1727	Additional material on rocks and minerals.	no			
1777	More critical thinking.	see comment 1264			

1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	see comment 1001			
1793	Please do not muddy the language regarding evolution	see comment 1001			
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	see comment 1001			
1799	Teach Evolution	see comment 1001			
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	see comment 157			
1811	Revert all of Diane Douglas's changes.	see comment 157			
1842	More Big Ideas in science should definitely begin to be incorporated at this point.	no	standards	no changes	3rd grade standards do incorporate big ideas
1859	Continue to teach evolution. Do not remove it to teach creationism	see comment 1001			
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.	see comment 1001			
1918	Refer to my response to question 17.	no			
1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.	see comment 1001			
1926	Darwin, please.	see comment 1001			
1929	(My rating refers to Life Science standards)Page 21, the topic described for third grade matches exactly with what is actually listed in standards for second grade (2.L2U1.9 and 2.L2U1.10). Page 25: The connection of the content taught with student's everyday life seems essential. Why is that deleted from the Introduction? It should be given extra prominence. The bold sentence seems deliberately modified to remove the idea that Earth resources are fuels and can be used up, replacing it with a bland statement that everything can be transformed into different forms of energy. Fossil fuels, for example, cannot be effectively be 'recreated' by transforming some other type of material/energy. The Earth, and life, have cycles, but not everything can be forever recycled.	1.2nd standards no 2. connections no 3.energy no	1. standards 2. connections 3. standards	1. no change 2. no change 3. no change	1. 3rd builds on 2nd no the same 2. connections to other content areas no science standards 3. NA to 3rd grade standards

1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.	see comment 1001			
1953	Teach proper evolution	see comment 1001			
1990	Evolution must continue to be taught	see comment 1001			
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	see comment 1001			
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no			
2013	Very obvious that the Dept of Education is afraid of teaching young students how humans impact the Earth.	no			
2015	Encourage further development of experimental skills.	see comment 1264			
2030	L4	no			
2032	Evolution	no			
2043	All standards need to be included.	no			
2062	No comment.	no			
2079	see previous comments.	no			
2093	The working group should consider both the opinion of experts in the field of science and the opinions of classroom teachers.	yes	other		working groups consisted of over 100 individuals including classroom teachers, instructional specialists, engineers, university professors, and industry professionals.
2096	Add sustainability, social science	no			sustainability does not fit with these standards
2107	Where is earth science? Plant science had been scaled bath to one item	no			plants are included within the life science standards the earth science standards support the life science standards
2112	Evolution is not described nor incorporated accurately. This must be changed.	see comment 1001			
2115	No specific recommendations for this level	no			
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	see comment 1001			
2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)	see comment 1092			
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.	see comment 1001			
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.	see comment 1001			
2259	Send the standards back for review.	yes	standards		they are being reviewed
2262	Explain evolution.	see comment 1001			
2265	Include Evolution, omit Creationism and Intelligent Design .	see comment 1001			

2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	see comment 1001			
2292	Change language in 3 L2u1.8 from use food chains... to use food webs- webs are more aligned with systems thinking, chains are more linear. Also, consider L2u3.9, change damaging effects of sunlight to damaging effects of drought (more relevant for AZ).	1. yes 2. no	1. standard 1. standard	1. suggested change: change the word chain to web	2. would no longer be life science standard
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no			
2345	Refer reply in 20 above.	no			
2348	You are only teaching parts of science.	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	see comment 1303			
2378	Needs to go back to review.	yes see comment 2259			
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.	see comment 1001			
2384	Please revise.	yes see comment 2259			
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	see comment 1001			
2428	Stick to actual science and stop dumbing down our children!	no			
2433	I would change back some of the original vocabulary terms used in 2004 explaining the Science Standards than the current	no			
2465	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.	see comment 1092			
2471	evolution rather than theory of	see comment 1001			
2487	N/A	no			
2512	More hands on standards - student will observe.	see comment 1264			
2515	You can talk about evolution. It's not voodoo! Keep christian beliefs out of science education.	see comment 1001			
2518	I couldn't care less about Third Grade.	no			
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	see comment 1001			
2529	Include health standard that includes body awareness pre puberty physical changes	no	standards	no change	science standards don't include health standards
2539	Senses have not been in standards since K-1	no	standards	no change	students now use senses when applying other standards
2543	TEACH EVOLUTION!	see comment 1001			

2559	In the section introduction: Why was the portion about light and sound waves removed? This statement addresses 3.P2U1.1, 3.P2U2.2, 3.P4U1.3 that are not addressed in the replacement sentence. 3.L1U1.5 does not fit with the summary statement at all.	1.yes 2. yes	standards	2. remove	1. Add sound into the introduction., bring back in that light is a source of energy., create a sentence that aligns better with the life science standard in the introduction paragraph. "students learn that...survival" 2. humans are animals consider human systems part of 3.L1U2.6
2582	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.	no	standards	no change	across grade bands the standards do increase in rigor. Content is similar across the grade band because we don't have time to teach everything in every grade level.
2607	Do not attempt to deny or water down the concepts of evolution.	yes	see comment 1001		
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	yes	see comment 1001		
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.	yes	see comment 1001		
2619	3.L2U2.7 requires students to do an experiment involving plants and animals. This means that teachers would have to incorporate live animals into the science lessons. For some of us this is not so easy to do. I personally am uncomfortable with keeping live animals in my classroom because I do not feel they can receive the proper amount of care required. So teaching this standard would be very difficult for me to do.	no	instruction	no change	this is based on how to instruct the standard. Possible option to use pill bugs.
2642	This section is good	no			

Survey Question	32. What would you like the working group to consider as they revise the 3rd Grade Physical Science Standards in the Third Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
89	No comment	no			
114	n/a	no			
119	I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.	no			

124	n/a	no			
143	3.P2U1.1 parts of does not need to be added, we need students to understand how light is observed by our eyes but they do not need to be able to identify the different parts of the eye also fear that adding this could change the standard from physical to life3.P2Us.2and parts of the human ear....again this may change the meaning of the original standard which is based	yes			Comment 31.143
145	Leave out the life science from this standard. Take out and parts of human eye, human ear etc.	Yes			Comment 31.143
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
183	Headings, big ideas, flow of concepts	no			
184	Concepts seems dull and boring	no			
189	A more clearer perimeters to teach within.	yes			See comment 31.189
190	They are not interesting to the average 8 year old nor are they engaging. the concepts are dull.	no			
208	Simplification.	no			
218	I feel these standards are well written and easily understood by teachers.	no			
225	I would like the working group to look at the National Science and Technology Standards and base the standards on that.	yes			see comment 31.224
227	Same as above	no			
252	n/c	no			
265	Page 22In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.Remove Key Concept ColumnsUnder 3.P2U1.1 - remove 'parts of', and Under 3.P2U2.2 - remove 'and parts of the human ear'. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes			see comment 31.203
281	Nothing	no			
284	What about animals adapting to the environment	yes	K-12 progression	no change need	see fourth grade
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
369	Sound and light waves are an abstract concept that might have better success taught in 4th or 5th.	yes	K-12 progression	no change need	Currently taught in 3rd grade
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Standards		See comment 31. 203
512	Remove the wording and parts of the human ear isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	standards		See comments 143 and 203

1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	standards	no change	evolution was not removed from third grade standards
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	see comment 1001		
1020	Page 32, Table, Row labeled P4 â€” see comment 19 - #3.	no			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	see comment 1001		
1091	A third grader's level of understanding of the Theory of Evolution.	no	see comment 1001		
1092	Standards 1 and 2: Adding parts of the human to the standard changes the focus from a physical science emphasis understanding properties of light and sound to a life science focus understanding functionality of organs.	yes	standard	changes to remove the human eye and ear examples and move to key concepts column	the eye and ear are examples of the relationship between light and lenses and sound waves.
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	see comment 1001		
1165	No comment	no			
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no	see comment 1001		
1186	See above.	no			
1196	See above	no			
1219	Get rid of intelligent design. Restore references to evolution.	no	see comment 1001		
1221	Make the standards not so broad.	no			
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	see comment 1001		
1226	Don't revise.	no			
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards	none	ADE directive
1305	Collect data and construct arguments based on evidence to explain how sound waves affect objects at varying distances and parts of the human ear. It is not developmentally appropriate that third graders be examining parts of the human eye or ear.	yes	comment 1092		
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	see comment 1303		

1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	see comment 1001		
1315	Get a scientific expert to rewrite the content or undo the edits.	no	see comment 157		
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no			
1339	Clearly include the teaching of the concept of evolution.	no	see comment 1001		
1366	Original language should remain	no	comment 157		
1403	Teach evolution. Evolution is science.	no	see comment 1001		
1443	evolution should be included in all grades	no	see comment 1001		
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	see comment 1001		
1526	Discussion of climate change should be included in the standards.	yes	standards	no change	this is within the grade band but is not in third grade
1553	See above	no			
1556	Remove all religious references.	no	see comment 1001		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	see comment 1001		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	see comment 1001		
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	no	see comment 1001		
1628	Teach Science and facts in Schools not faith and religion.	no	see comment 1001		
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	see comment 1001		
1664	See comment #9	no			
1678	The addition of closed system is a good edit and increases the accuracy of the statement.	no			
1681	N/a	no			
1694	Only facts based on repeatable scientific tests.	no			
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	no	see comment 1001		
1793	Please do not muddy the language regarding evolution	no	see comment 1001		
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	see comment 1001		
1799	Teach Evolution	no	see comment 1001		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	no	see 157		
1811	Revert all of Diane Douglas's changes.	no	see 157		
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	see comment 1001		
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.	no	see comment 1001		
1918	Refer to my response to question 17.	no			

1923	3.P4U1.3 seems to advanced	yes	standards	no change	this standard is the base for future standards in the grade band.
1953	Teach proper evolution	no	see comment 1001		
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	see comment 1001		
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no			
2015	Ambivalent.	no			
2032	Evolution	no			
2043	All standards need to be included.	no			
2062	No comment.	no			
2079	see previous comments.	no			
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	see comment 1001		
2156	parts of human eye / parts of human ear - delete. The students knowing of the parts would be a life science standard and better fit in health standards.	yes	see comment 1092		
2210	Evolution must be taught	no	see comment 1001		
2259	Send the standards back for review.	yes	standards		they are being reviewed
2262	Explain evolution.	no	see comment 1001		
2265	Include Evolution, omit Creationism and Intelligent Design .	no	see comment 1001		
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	no	see comment 1001		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no	see comment 1001		
2345	Refer reply in 20 above.	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	see 1303		
2378	Needs to go back to review.	yes	see 2259		
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.	no	see comment 1001		
2384	Please revise.	yes	see 2259		

2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	see comment 1001		
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	see comment 1001		
2428	Stick to actual science and stop dumbing down our children!	no			
2465	In 3.P2U1.1 - why add and parts of the human eye ? how light behaves is an important concept in and of itself. to add the lenses and the human eye complicates the standard - and it does not have to. Same with 3.P2U2.2 with sound and human ear.	yes	1092		
2487	N/A	no			
2515	see above	no			
2518	I couldn't care less about Third Grade.	no			
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	see comment 1001		
2559	3.P2U1.1 This changes the standard from physical science to life science as the structure and function of the eye is introduced.3.P2U2.2 This changes the standard from physical science to life science as the structure and function of the ear is introduced.	yes	see comment 1092		
2607	Do not attempt to deny or water down the concepts of evolution.	no	see comment 1001		
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	see comment 1001		
2642	This section is good	no			

Survey Question	33. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Third Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Actionable Yes/No	Suggested Changes	Committee Notes
89	No comment	no			
114	n/a	no			
119	I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.	no			
124	n/a	no			
143	nothing	no			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			

162	Adopt NGSS standards	no			
170	Funding	no			
172	Please revisit rocks and minerals and the energy it takes to create and destroy them! Or how about the energy humans receive by consuming minerals in their daily diets.	yes	organization	no change needed	see fourth grade earth science standards.
184	Earth and Space Science are both fun and intriguing for 8 and 9 year olds	no			
189	A more clearer perimeters to teach within.	yes	assessments		see comment 31.189
190	I think this one was well done.	no			
208	Simplification.	no			
218	The Earth/Space Science standard seems out of place as it does not tie in with other science learning.	no			lack on conceptual understanding because light waves, energy are both tie to the sun the needs of organisms.
225	I would like the working group to look at the National Science and Technology Standards and base the standards on that.	no			
227	Same as above	no			
252	n/c	no			
265	Page 22Remove Key Concept Columns	yes			See comment 31. 203
281	Nothing	no			
284	why just sun energy? CKLA also has the planets	yes	K-12 progression	no change needed	concept of energy is expanded through the grade levels, focusing on the sun is appropriate at this grade level. The big ideas document brings planets into middle school, 3-5 focuses on sun, earth, and moon.
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
369	Solar system-planets in 3rd grade?	yes	K-12 progression	no change needed	see comment 33.284
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Key concepts		see comment 31.203
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 31.204
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	standards	no change	evolution was not removed from third grade standards
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	see comment 1001		
1031	Please include climate change				

1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	see comment 1001		
1091	A third grader's level of understanding of the Theory of Evolution.	no	see comment 1001		
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	see comment 1001		
1165	No comment	no			
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no	see comment 1001		
1186	See above.	no			
1196	See above	no			
1219	Get rid of intelligent design. Restore references to evolution.	no	see comment 1001		
1221	Be more specific with each standard	no			
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	see comment 1001		
1226	Don't revise.	no			
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards	no change	ADE directive
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	see comment 1303		
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	see comment 1001		
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	standards		they are being reviewed
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no			
1339	Clearly include the teaching of the concept of evolution.	no	see comment 1001		
1366	Original language should remain	no			
1403	Teach evolution. Evolution is science.	no	see comment 1001		
1443	evolution should be included in all grades	no	see comment 1001		
1464	Not Enough! Is this really all you're going to teach. How long will that take? I can teach a kid this in 5 min tops. This is where you should keep re-emphasizing wind, water and then sun as well. Just cover renewable energy and extend it to plants to get that point across too. Plants and solar panels really aren't that different are they? they gather photons (depending on the panel) for energy. They just have different parts to do it.	yes	standards	no change	the emphasis is on depth not breadth
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	see comment 1001		
1526	Big Bang Cosmology and Climate Change should be part of any earth and space sciences curriculum and standards.	yes	standards	no change	no in third grade standards

1538	3.E1U1.4 seems like a rewording of 2.L2U1.10. Is this standard supposed to suggest that students explore how the sun drives movements in the atmosphere and hydrosphere? Note that internal heat the Earth's core is also a significant source of energy and drives plate movements, so I think some clarification is needed about what is meant by primary.	yes	standards	provide clarification in both second and third grade in the learning progressions	
1553	See above	no			
1556	Remove all religious references.	no	see comment 1001		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	see comment 1001		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	see comment 1001		
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	no	see comment 1001		
1628	Teach Science and facts in Schools not faith and religion.	no	see comment 1001		
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	see comment 1001		
1664	See comment #9	no			
1681	N/a	no			
1694	Only facts based on repeatable scientific tests.	no			
1709	Arizona is blessed with rich geologic formations that are exposed for easy study and exploration. The third grade earth and space standards need to focus more heavily on rocks and minerals as they relate to Arizona geology.	yes	standards	no change	is within grade level band in fourth grade
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	no	see comment 1001		
1793	Please do not muddy the language regarding evolution	no	see comment 1001		
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	see comment 1001		
1799	Teach Evolution	no	see comment 1001		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	no	see comment 157		
1811	Revert all of Diane Douglas's changes.	no	see comment 157		
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	see comment 1001		
1877	Evolution!	no	see comment 1001		
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.	no	yes	see comment 1001	
1918	Refer to my response to question 17.	no			
1953	Teach proper evolution	no	see comment 1001		
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	see comment 1001		
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no	see comment 1001		

2015	Ambivalent.	no			
2032	Evolution	no			
2043	All standards need to be included.	no			
2062	No comment.	no			
2079	see previous comments.	no			
2112	Evolution is not described nor incorporated accurately. This must be changed.	no	see comment 1001		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	see comment 1001		
2259	Send the standards back for review.	yes	see comment 1315		
2262	Explain evolution.	no	see comment 1001		
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .	no	see comment 1001		
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	no	see comment 1001		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no			
2345	Refer reply in 20 above.	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	see comment 1303		
2378	Needs to go back to review.	yes	see comment 1315		
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.	no	see comment 1001		
2384	Please revise.	yes	see comment 1315		
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	see comment 1001		
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	see comment 1001		
2428	Stick to actual science and stop dumbing down our children!	no	see comment 1001		
2487	N/A	no			
2515	see above	no			

2518	I couldn't care less about Third Grade.	no			
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	see comment 1001		
2543	TEACH EVOLUTION!	no	see comment 1001		
2605	Same comments as 2nd grade	no			
2607	Do not attempt to deny or water down the concepts of evolution.	no	see comment 1001		
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	see comment 1001		
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.	no	see comment 1001		
2621	Add more here. Kids that age generally like dinosaurs and fossils. Use this to begin a discussion of geologic time and how fossils form. You use fossils for the fourth grade.	yes	see comment 1709		
2642	This section is good	no			

Survey Question	34. What would you like the working group to consider as they revise the Life Science Standards in the Third Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item addressed	Suggested Changes	Committee Notes
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	no			no evolution section in grade three
119	I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.	no			
124	n/a	no			
143	nothing	no			
145	3.L1u1.5 in reading the header the life science focus is on energy and specialized features for survival not random know the body parts/systems and how they carry out life processes	yes	standard	remove 3.L1U1.5	This standard is already addressed in 3.L1U2.6 and the Big Idea 7 (L1) addresses the structure and function of "organisms" and humans fall under that category. The key concepts of this standard distract from the true meaning of the big idea/standard.
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			

170	Funding	no			
183	What human body systems? Also, this concept could be taught the entire year. Then it goes into plans and the food chain. How do these concepts flow. they are not cohesive.	yes	standard	remove "human body system" specifically go back to language of "organisms"	see comment 145
184	Life Science is has clear concepts and standards. Kids will enjoy this unit.	no			
189	A more clearer perimeters to teach within.	yes	assessment		see comment 143
190	This one is done fine.	no			
208	Simplification.	no			
218	The introduction of 3.L1U1.5 feels out of alignment with the other 4 standards that focus on plants/animals. 3.L2U3.9 also feels like it has been tacked on even though it doesn't fit well.	yes	standard	remove 3.L1U1.5 keep 3.L2U3.9	see comment 145 kept 3.L2U3. 9 because of the core idea U3 (Big Idea 13)
225	I would like the working group to look at the National Science and Technology Standards and base the standards on that.	no			
227	Same as above	no			
252	n/c	no			
265	Page 23Remove Key Concept ColumnRemove 3.L1U1.5 - since it is in green, the teacher's did not indicate that this is a standard that should be taught at the 3rd grade level. Renumbr 6 through 9 to be 6 through 8.	yes	standard		see comment 145
281	Nothing	no			
284	Just have the eye and ear for the human body since it goes with light and sound energy	yes	standard	remove all reference to specific body parts	see comment 31.143 and 34.145
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
369	Seems heavier than the other two. Should they be equally weighted?	false statement			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Key concepts		see comment 31.203
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 31.203
1001	Na	no			
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	standards	no change	evolution was not removed from third grade
1017	The inclusion of evolution must be reinstated.	no	see comment 1008		
1020	Page 32, Table, Row labeled L4 â€" see comment 19 - #4.	no	see comment 1008		
1031	Please include evolution	no	see comment 1008		
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	see comment 1008		
1091	A third grader's level of understanding of the Theory of Evolution.	no	see comment 1008		

1092	Standard 5 does not add anything that isn't already in standard 6. Not sure what students would be evaluating.	yes	standards	delete standard 5	move information into key concepts for standard 6
1113	We need to start teaching children about all aspects of life including evolution from the very beginning.	no	see comment 1008		
1165	No comment	no			
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no	see comment 1008		
1186	See above.	no			
1190	Environmental studies should include information regarding human impact.	yes	standards	no change	it is in the grade band just not in third grade
1196	See above	no			
1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory. Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory	yes	other		the working groups consisted of over 100 individuals from the state including classroom teachers, instructional specialists, engineers, university professionals, and industry professionals.
1219	Get rid of intelligent design. Restore references to evolution.	no	see comment 1008		
1221	Make the standards a lot more specific. We need longer than just this next two months to have the standards ready to work on with the students in our classes. We need another year to work on them before we present them to the students.	no	instruction		teachers will have a year
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	see comment 1008		
1226	Don't revise.	no	see comment 157		
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.	no	see comment 1008		
1296	Evolution should not be omitted from this curricula.	no	see comment 1008		
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards		ADE Directive
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	see comment 1303		
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put AZ students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.	no	see comment 1008		
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	see comment 1203		
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no			

1338	What follows is repeated for grades 3-5 and is based on the Distribution... Table: 'L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven. Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'	yes	introduction		make changes recommended by introduction group
1339	Clearly include the teaching of the concept of evolution.	no	see comment 1008		
1366	Original language should remain	no	see comment 157		
1403	Teach evolution. Evolution is science.	no	see comment 1008		
1443	evolution should be included in all grades	no	see comment 1008		
1449	The body systems are taught in third grade science per this draft. I looked through the rest of the life science standards and DID NOT SEE THEM IN ANY OTHER GRADE LEVEL. They used to be in 5th and 6th grade and at a secondary level in high school biology/anatomy classes. Why third grade? And are they supposed to remember them without being readdressed until collegiate level classes? Body systems could be taught in third grade, but should definitely appear somewhere else later on in more specific detail and terms.	yes	standard		consider adding standards directly related to the human body
1500	They need to start learning about where they and everything came from, via evolution	no	see comment 1008		
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	see comment 1008		
1526	Evolution should be included in any life science or biological class	no	see comment 1008		
1538	3.L1U1.5 is the same as and has the same problem as K.L1U1.5. Why is this standard in both places? If you want to have a progression, then 3.L1U1.5 needs to include some additional sophistication that builds on K.L1U1.5. 3.L2U1.8 - I think the word exchange is inaccurate in this standard. The standard should read Use food chains as system models to describe the flow of energy from the sun to plants to animals.	1. yes 2. yes	1. standards 2. standards	1. provide clarification in the learning progression 2. substitute the word web for chain	

1550	Standard 3.L2U1.8 seems to not be in the same developmental level as the others. The key concepts for the first standard make more sense for this than those presented for this standard. I am unsure how classification of animals as omnivores, herbivores, etc. correlated to explaining and creating for models for different processes carried out by animals.	yes	standard	substitute the word web for chair. Also recommend the learning progression for standard 6 be updated.	
1553	See above	no			
1556	Remove all religious references.	no	see comment 1008		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	see comment 1008		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	see comment 1008		
1589	nothing - it is well written and includes evolution as a science topic.	no			
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	no	see comment 1008		
1628	Teach Science and facts in Schools not faith and religion.	no	see comment 1008		
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	see comment 1008		
1664	See comment #9	no			
1678	Knock it off with these silly changes that are less accurate	no			
1681	N/a	no			
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.	no	see comment 1008		
1694	Only facts based on repeatable scientific tests.	no			
1739	See my comments in Question 15	no			
1787	The unity and diversity of organisms, living and extinct, is the result of evolution.	no	see comment 1008		
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	no	see comment 1008		
1793	Please do not muddy the language regarding evolution	no	see comment 1008		
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.	no	see comment 1008		
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	see comment 1008		
1799	Teach Evolution	no	see comment 1008		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	no	see comment 157		
1811	Revert all of Diane Douglas's changes.	no	see comment 157		
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	see comment 1008		
1883	include evolution	no	see comment 1008		

1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.	no	see comment 1008		
1918	Refer to my response to question 17.	no			
1923	3.L2U2.7 could go very badly. I'd specify specific stimuli, like light/dark, which would tie nicely into 3.L2U3.9	yes	standards	add to learning progression	
1926	Darwin, please.	no	see comment 1008		
1941	Introduce the theory of evolution at this level.	no	see comment 1008		
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.	no	see comment 1008		
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.	no	see comment 1008		
1953	Teach proper evolution	no	see comment 1008		
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	see comment 1008		
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no			
2013	STOP calling Evolution a theory.	no	see comment 1008		
2015	As before, more on evolutionary theory.	no	see comment 1008		
2030	L4	no			
2032	Evolution	no			
2043	All standards need to be included.	no			
2054	decomposers	no			
2062	Evolution needs to be added back in as fact.	no	see comment 1008		
2079	see previous comments.	no			
2093	Be wary of wording about theories and beliefs . If a theory has been widely observed to be true over an extensive period of time, it is for all effects and purposes scientific fact . (See the National Academy of Sciences comments about Is Evolution a Theory or a Fact?) Beliefs can be held without evidence--science is by nature evidentiary.	no			
2111	See previous comments on the treatment of evolutionary biology.	no	see comment 1008		
2112	Evolution is not described nor incorporated accurately. This must be changed.	no	see comment 1008		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	see comment 1008		
2156	3.L1U1.5 - not appropriate for this age level - delete. In Working with Big Ideas, this concept can be found on pg 26 for 11-14 years olds - not 3rd graders.	yes	standards	consider moving to the next grade band	
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	see comment 1008		
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.	no	see comment 1008		
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	see comment 1008		

2259	Send the standards back for review.	yes	see comment 1315		
2262	Explain evolution.	no	see comment 1008		
2265	Include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .	no	see comment 1008		
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.	no	see comment 1008		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no			
2345	Refer reply in 20 above.	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	see comment 1303		
2378	Needs to go back to review.	yes	see comment 1315		
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.	no	see comment 1008		
2384	Please revise.	yes	see comment 1315		
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.	no	see comment 1008		
2416	If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.	no	see comment 1008		
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	see comment 1008		
2428	Stick to actual science and stop dumbing down our children!	no			
2487	N/A	no			
2515	see above	no			
2518	I couldn't care less about Third Grade.	no			
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	see comment 1008		

2559	3.L1U1.5 This standard is not related to the other standards in the draft, does not fit the summary of the grade level, does not address the phenomenon of cause and effect OR energy and matter AND it appears to have been pulled from the Core Knowledge curriculum document.3.L2U3.9 Are we advocating testing on animals? In order to show that a solution REDUCES damage, there must be a control. In other words, some organisms would have to be purposefully exposed to damaging conditions to be a point of comparison. This is unethical and has no place in an elementary classroom.	yes	standard	1. comment 2156 2. reccomend to change plants and animals to organisms and then include a disclaimer not to harm animals	
2607	Do not attempt to deny or water down the concepts of evolution.	no	see comment 1008		
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	see comment 1008		
2619	See #38 above. Also, you may want to reword 3.L2U2.7 so you are more specific about the type of stimuli. As it reads now, it seems like we're encouraging students to harm animals in the name of science.	yes	standards	include a disclaimer in the learning progression to not harm animals	
2642	This section is good	no			
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.	no	instruction		

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	36. What would you like the working group to consider as they revise the Fourth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
56	page 26 - 4.E1U2.6 - support an argument on whether .....provide evidence - this statement is counterintuitive. These things listed DO provide evidence for this concept. This statement should read something more along the lines obtain and analyze evidence that support past plate movement...	yes	Standard	Change: Pick one practice: Engage in an argument using geologic evidence to explain past plate tectonic movement.	
62	The rock cycle should remain in third grade and 4th should continue to teach the weather unit and water cycle.	yes	organization	no change needed	based on the Framework these concepts are at the correct grade level
89	The scientific method needs to be included.	yes	Introduction	do not add	There is not one scientific method, there are many ways to know and understand the natural world
108	The statement for the 4th grade standard is INCORRECT in Physical Science.	no			
114	n/a	no			
124	n/a	no			
145	Please read from MIT 'Magnetism is a force, but it has no energy of its own,' says David Cohen-Tanugi, vice president of the MIT Energy Club and a John S. Hennessy Fellow in MIT's Materials Science and Engineering department. Still, he adds, 'magnetism is extremely useful for converting energy from one form to another. About 99% of the power generated from fossil fuels, nuclear and hydroelectric energy, and wind comes from systems that use magnetism in the conversion process.' Magnetism is NOT energy it is a force.	yes	Standard	Take out the words "and magnetic"	to make the statement scientifically accurate
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			
170	Funding	no			
180	The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.	no			
189	A more clearer perimeters to teach within.	yes	Standard		Committee should consider assessment boundaries
195	At this time, we do not have considerations, since expectations are pinpointed and standards build upon grade levels before. Common language is helpful for student learning and high school preparation.	no			
196	at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.	no			
203	The Key concepts should be dropped from every grade level.				
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
218	I like the overall tie-in to energy, gives a consistent feel to the standards.	no			
235	Our team thought that some of the standards in the content area would be a little challenging for our population.	no			
252	n/c	no			

265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards. Page 21Remove additions by ADE: 'and between content areas' and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes	Key concepts and Connections to other content areas		see comment 203
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			
291	Basically, the 6th grade articulated standards are moving into the 4th grade crosscutting standards.	no			
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
355	Keep U standards in each standard. Offer more questioning to cause deeper learning.	no			
378	Take out any reference to scientific methodConcepts taught in 1.P3U1.3 and magnet composition, magnetic: forces, poles, fields, attraction, static electricity, electric current, circuits, conductors, insulators, electromagnets, electrical charge (protons, electrons), safetyMagnetic composition for fourth grade is not age appropriate. Magnetism is the result of the atoms of the matter behaving a particular way which is not appropriate at this grade.	yes	Standard and introduction	Make the recommended change to scientific method; remaining comment also take their recommendation to remove magnetism	
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Key concepts		see comment 203 in third grade
429	Please be aware of the testing expectations for this grade when planning the curriculum map.	no			
472	The 4th grade Earth and Space science standards are fantastic. They support rigor and critical thinking.	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 203 in third grade
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	standards	no change	evolution was not removed from 4th grade the building blocks are still there
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	see comment 1001		
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	see comment 1001		
1091	A fourth grader's level of understanding of the Theory of Evolution.	no	see comment 1001		

1092	This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands. Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally , many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove they key concepts column from the document. If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for 4.E1U2.7 Follow this process for each of the fourth grade standards, not just the example below. Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: Identify the evidence that supports particular points in an explanation. Local , regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. Patterns can be used as evidence to support an explanation. Science assumes consistent patterns in natural systems.	yes	1. standards 2. other 3. key concepts	1. no change 2. remove from standards	1. number of standards increased with the daily minute increase 2. create supplemental document that can be updated as needed. 3. comment agrees with proposed changes to key concepts.
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	see comment 1001		
1165	No comment	no			
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no	see comment 1001		
1186	See above.	no			
1196	See above	no			
1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory	yes	other		working groups consisted of over 100 individuals from state including classroom teachers, instructional specialists, engineers, university professors, and industry professionals.
1219	Get rid of intelligent design. Restore references to evolution.	no	see comment 1001		
1221	I don't teach 4th	no			
1222	Not utilize language in re Darwinism, natural selection or evolution.	no	see comment 1001		
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	see comment 1001		
1226	Don't revise.	no	standards		committee should reconvene to make the adjustments to the public comment
1264	Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world.	no			science and engineering concepts address this
1274	4.E1U2.6 seems very similar to the added 7th grade standard: 7.E1U2.5 -- the 7th grade standard is printed in green. Should one of these be revised or deleted?	yes	standards	learning progression should clarify level of rigor for fourth to 7th grade	

1278	Omits the need to look at energy critically and how the Earth's systems interact with each other. The key concepts go off on tangents not related to the standard or put an unnecessary focus on irrelevant aspects of the standard.	yes	standards	learning progression should provide more clarification	
1298	Same as before.	no			
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards		ADE Directive
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.	yes	key concepts		committee is considering this within the bounds directed by ADE
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	see standard 1303		
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.	no	see comment 1001		
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	see comment 157		
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no	see comment 1001		
1339	Clearly include the teaching of the concept of evolution.	no	see comment 1001		
1366	Original language should remain	no	see comment 1001		
1403	Teach evolution. Evolution is science.	no	see comment 1001		
1443	evolution should be included in all grades	no	see comment 1001		
1464	Ok...so suddenly we switch to natural disasters after the whole energy thing. I'm fine with that. Whatever,but...do you even know what geosphere is? Why did you list parts of it afterwards...I think it's cause you didn't know what else to do. It's like me saying...I'm going to teach about a water bottle and also I'm going to teach a whole separate topic of the water bottle cap...and how they're connect...ya...that was hard to figure out. These topics are too verbose and they look like a lot but they really aren't.	no			
1500	They need to start learning about where they and everything came from, via evolution	no	see comment 1001		
1517	Bring back the word evolution.	no	see comment 1001		
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	see comment 1001		
1526	Climate change, evolution, and big bang cosmology should be in these standards.	no	see comment 1001		
1538	It seems that as with the current science standards, there is more content in 4th grade (12 standards) than 3rd or 5th grade. Is it possible to reduce some of the standards in 4th grade or distribute them to 3rd grade (only 9 standards)?	yes	standards	no change	number of standards increased with the daily minute increase
1548	See comments from previous re: 4.L4U4.12	no			
1553	See above	no			
1556	Remove all religious references.	no	see comment 1001		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	see comment 1001		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	see comment 1001		
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!	no	other		the science and engineering practices address this
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	no	see comment 1001		
1628	Teach Science and facts in Schools not faith and religion.	no	see comment 1001		
1639	Students need MORE SCIENCE in every level!	no			
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	see comment 1001		

1664	See comment #9	no			
1681	The bullet point about 4th grade specifically on page 21. I feel the crossed out verbiage is preferable because it clearly indicated that there are cause and effect relationships between changes of resources and survival. Same thing goes for the crossed out verbiage on the top of page 25.	yes	introduction	reword bullet point to address concent	
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.	no	see comment 1001		
1777	More critical thinking.	no			
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	no	see comment 1001		
1793	Please do not muddy the language regarding evolution	no	see comment 1001		
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	see comment 1001		
1799	Teach Evolution	no	see comment 1001		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	yes	see comment 157		
1811	Revert all of Diane Douglas's changes.	yes	see comment 157		
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	see comment 1001		
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.	no	see comment 1001		
1918	Refer to my response to question 17.	no			
1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.	no	see comment 1001		
1926	Darwin, please.	no	see comment 1001		
1929	My rating reflects Life Science StandardsL4Generally the life science standards seem less ties to the overall topics of the year and less ambitious, for third and fourth grade. In particular, with the focus in fourth grade on systems, it would be natural to talk more about ecological systems, food webs, connecting life cycles or food webs with cycles of water and energy on ecosystem scales, or talking about how food webs create interdependent communities, or how resources cycling also implies that one change in a resource or organism can impact many others. None of this seems to be mentioned anywhere in standards up to fourth grade despite such a focus on food chains and cycles for water and energy in standards	yes	standards	no change	this is within the grade band so will be taught
1930	Although I am not an elementary school teacher, I suggest that the Theory of Evolution be introduced by the fourth grade at the latest.	no	see comment 1001		
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.	no	see comment 1001		
1953	Teach proper evolution	no	see comment 1001		

1957	This is where evolution should be introduced	no	see comment 1001		
1990	Evolution must continue to be taught	no	see comment 1001		
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.	no	see comment 1001		
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.	no			
2013	Put back what Dept of Education crossed out in paragraph 1 on page 25. On pg 27, L4U4, put back the original language and stop insinuating that there is evidence to refute Evolution. Remove argument from the text.	yes	introduction	review struck out language	
2015	Student-led experiments and sharing of said experiments.	no	instruction		
2030	L4	no			
2032	Evolution	no			
2043	All standards need to be included.	no			
2062	No comment.	no			
2079	see previous comments.	no			
2093	See item 38 and 41 above.	no			
2096	Add social sciences and sustainability	yes	standard	consider adding to 4.P4U4.3	
2112	Evolution is not described nor incorporated accurately. This must be changed.	no	see comment 1001		
2115	Stronger emphasis on the scientific method. This is the stage when students can be made explicitly aware of the scientific method. It can be exciting for children to be exposed to the idea that there is a standard set of steps they can use to test their impressions about the natural world, to tell if a statement is true or false. This is a good time to learn that personal impression can be misleading, and that science provides a way to tell if they are being tricked by their own senses.	yes	see comment 1264		
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.	no	see comment 1001		
2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)	yes	key concepts	comment agree with proposed changes to key concepts	
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	see comment 1001		
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.	no	see comment 1001		
2259	Send the standards back for review.	yes	see comment 1315		
2262	Explain evolution.	no	see comment 1001		
2265	Include Evolution, omit Creationism and Intelligent Design.	no	see comment 1001		
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.	no	see comment 1001		
2286	Reinstate evolution.	no	see comment 1001		
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.	no			
2345	Refer reply in 20 above.	no			
2354	.....	no			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.	no	see comment 1303		
2378	Needs to go back to review.	yes	see comment 1315		
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.	no	see comment 1001		
2384	Please revise.	yes	see comment 1315		

2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)	no	see comment 1001		
2428	Stick to actual science and stop dumbing down our children!	no			
2465	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.	no	comment 2156		
2471	evolution rather than theory of	no	see comment 1001		
2487	Restore 4.L4U4.12 to original terminology.	yes	see comment 2013		
2512	too watered down	no			
2515	see above	no			
2518	I couldn't care less about Fourth Grade.	no			
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.	no	see comment 1001		
2529	Include health standard that includes body awareness pre puberty physical changes especially for girls	no	standards	no change	science standards do not include health standards
2539	Again, are there resources that districts will be able to purchase that align to the content at each grade level?	no	curriculum/resources		
2543	TEACH EVOLUTION!	no	see comment 1001		
2559	In the section introduction: This statement does not provide an overview of the 4th grade standards.On Page 25, when this section 'students expand on the idea that energy from the Sun interacts with Earth systems and explore other forms of energy we use in everyday life. Students apply their understanding of the various Earth systems (geosphere, hydrosphere, atmosphere, biosphere) and how they interact with each other and heat from the Sun. Students understand how geological systems change and shape the planet and provide the resources for fuels. Students also develop an understanding how Earth processes and human interactions can change environments impacting the ability for organisms to survive.' Was condensed to 'Students also understand how weather, climate, human interactions, and geological systems change and shape the earth and the factors impacting organism diversity', clarity was lost.	yes	see comment 1681		
2582	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.	no	standards	no change	across grade bands standards do grow in rigor content is distributed across grade band however there is not enough to teach everything at every grade level
2607	Do not attempt to deny or water down the concepts of evolution.	no	see comment 1001		
2614	Standard 4.E1U1.5's key concepts are too difficult for this grade level.	yes	see comment 1278		
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!	no	see comment 1001		
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.	no	see comment 1001		
2642	Students should be taught how the energy for electricity is obtained. Magnetic currents don't exist.	yes	standards	reword for accuracy	
2658	The draft of science standards is fine. I understand that rocks are normally taught in 3rd grade, however I think that they align with 4th grade standards.	no			
2662	See my previous comments	no			

Survey Question	37. What would you like the working group to consider as they revise the Physical Science Standards in the Fourth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
89	No comment	no			
108	These statements are INCORRECT: Students develop an understanding of how Earth's resources can be transformed into different forms of energy. Students develop a better understanding of electricity and magnetism and how they are forms of energy. Earth's resources cannot be developed into energy; they can be transformed into fuels that provide energy. Electricity and magnetism are NOT forms of energy.	yes	standard	see comment 145	
114	Evolution section is weak and watered down. It needs to be strengthened.	yes	standard	Leave 4L4U2.11 alone 4L4U4.12 should say Use evidence to support a claim about the factors that cause organisms to go extinct and how human can impact those factors	
124	n/a	no			
143	4.P4U2.2the addition of magnetic has made this standard scientifically inaccurate, there is no such thing as magnetic currents	yes	see comment 2642 from fourth grade		
145	No such thing as magnetic currents. Throughout the standards there is a clear misconception of what is energy, what is a fuel source, what is force, and what is power. These are all changes in green.	yes	see comment 2642 (4th grade)		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
178	Please expand on the construct an explanation and engage in argument from evidence in 4.P4U4.3. eg. write an essay, etc.				
180	The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.	no			
189	A more clearer perimeters to teach within.	yes	standard		Committee is recommending assessment boundaries
196	at this time there is nothing that I feel they need to consider, since they had pointed their expectations.	no			
208	Simplification.	no			
218	More information about what types of energy teachers should focus on should be included. Will they need to spend time on: Potential, chemical, nuclear, gravitational, mechanical, Kinetic, GRAVITATIONAL, CHEMICAL, NUCLEAR, ELASTIC, MOTION, THERMAL ENERGY AND TEMPERATURE. Without more focus, this could be the only focus for the entire year!	yes	standard	no change needed	the addition of learning progressions will help address this is need.
235	Our team wanted to know how or what type of resources (books, newspapers, etc.) would be given to the grade level to meet these standards.	no			
252	n/c	no			
265	Page 25In the first and second paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for. Remove Key Concept Column Under 4.P4U2.2 - why did 'and magnetic' get added by ADE? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	Yes			
266	4.P4U2.1The transfer of energy standard is too vague. Are we supposed to teach the radiant energy spectrum, or electromagnetism, or both? Is there more to energy transfer that needs to be taught? We need the standards to be more specific, so we know exactly which aspects to teach.	yes	standard	no change needed	the addition of learning progressions will help address this is need.

281	Nothing	no			
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
378	page 25Incorrect information:Table Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents.Must remove 'and magnetic'After speaking to an APS training supervisor and requesting help to understand what magnetic currents are I was told there were no such thing.	yes	standard	remove magnetic	to make it scientifically accurate
381	Make it clear if this is more than electric circuits, as P4U2.1 could also be water, wind, or solar energy being transferred as well.	yes	standard	no change needed	
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Key concepts		see comment 203 in third grade
491	Where's the engineering and technology (coding)	no			
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 203 in third grade
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.	no	standard		evolution is not removed from fourth grade the uilding blocks are still there.
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.	no	see comment 1001		
1020	Page 32, Table, Row labeled P4 â€” see comment 19 - #3.	no			
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.	no	see comment 1001		
1091	A fourth grader's level of understanding of the Theory of Evolution.	no	see comment 1001		
1092	Standard 2. magnetic currents is inaccurate	yes	see comment 2642		
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!	no	see comment 1001		
1165	No comment	no			
1167	That school is for teaching facts, not for promoting the views of any particular religious group.	no	see comment 1001		
1186	See above.	no			
1196	See above	no			
1219	Get rid of intelligent design. Restore references to evolution.	no	see comment 1001		
1221	I don't teach 4th	no			
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.	no	see comment 1001		
1226	Don't revise.	no			the committee should reconvene to make adjustments to the public comment
1276	4.P4U2.2Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents.This is inaccurate, there are no magnetic currents.	yes	see comment 2642		
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.	no	standards		ADE directive
1305	Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents. Magnetic currents do not exist, please remove.	yes	see comment 2642		
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.	no	see comment 1303		

1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.	no	see comment 1001		
1315	Get a scientific expert to rewrite the content or undo the edits.	yes	see comment 1203		
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.	no			
1339	Clearly include the teaching of the concept of evolution.	no	see comment 1001		
1366	Original language should remain	yes	see comment 157		
1403	Teach evolution. Evolution is science.	no	see comment 1001		
1443	evolution should be included in all grades	no	see comment 1001		
1517	Ditto	no			
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.	no	see comment 1001		
1526	Climate change, evolution, and big bang cosmology should be in these standards.	no	see comment 1001		
1538	There are several places in the draft standards where the term model seems to suggest a physical demonstration of a concept rather than a representation used to explain or predict. 4.P4U2.2 is one of those examples. I would rather see this standard state Develop and use a model to explain and predict how energy is moved through electric. Also, rather than magnetic currents this standard should refer to magnetic fields.	yes	see comment 2642		
1553	See above	no			
1556	Remove all religious references.	no	see comment 1001		
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.	no	see comment 1001		
1583	Adding and maintaining teaching Evolution needs to be continued.	no	see comment 1001		
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.	no	see comment 1001		
1628	Teach Science and facts in Schools not faith and religion.	no	see comment 1001		
1641	N/A	no			
1645	No comment.	no			
1660	Fix evolution standards.	no	see comment 1001		
1664	See comment #9	no			
1681	N/a	no			
1694	Only facts based on repeatable scientific tests.	no			
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!	no	see comment 1001		
1793	Please do not muddy the language regarding evolution	no	see comment 1001		
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.	no	see comment 1001		
1799	Teach Evolution	no	see comment 1001		
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.	yes	see comment 157		
1811	Revert all of Diane Douglas's changes.	yes	comment 157		
1859	Continue to teach evolution. Do not remove it to teach creationism.	no	see comment 1001		
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.	no	see comment 1001		
1918	Refer to my response to question 17.	no			
1923	Most kids will be too young to grasp the key concepts from 4.P4U2.2You seriously expect an 8 year old to truly understand what protons and electrons are?	yes	standard	no change	
1953	Teach proper evolution	no	see comment 1001		
1957	see above				

1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2465	The way in which the standards are written can cause misconceptions and confusions about energy as it is defined in science. There are different forms of energy including kinetic, potential, chemical potential, light, sound, heat, etc. In NGSS, energy standard reads, Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. This is not confusing.				
2487	N/A				
2515	see above				
2518	I couldn't care less about Fourth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				

2559	4.P4U2.2 There is no such thing as a magnetic current.4.P4U4.3 What are students supposed to be explaining? This standard does not make sense.				
2574	Consistency in terminology - magnetic fields is the proper term, not currents.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	Students should be taught how the energy for electricity is obtained. Magnetic currents don't exist.				
2658	n/a				

Survey Question	38. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Fourth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
62	Water cycle and weather unit have been removed. We follow Project Wet and do the city wide Water Festival. These activities and lessons are created to use with 4th graders.	no			
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	yes	standard	Leave 4L4U2.11 alone 4L4U4.12 should say Use evidence to support a claim about the factors that cause organisms to go extinct and how human can impact those factors	
124	n/a	no			
143	none	no			
155	More focus with engineering and computer science in these areas.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
180	The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.	no			
189	A more clearer perimeters to teach within.	yes			committee is recommending assessment boundaries
196	at this time there is nothing that I feel they need to consider, since they had pointed their expectations.	no			
208	Simplification.	no			
218	This feels like it could be the entire focus for the year- lots of information to cover. Disasters feels like an afterthought; does it truly play an important role in the curriculum for 4th grade?	no			

235	Our team likes this standard, it appears to be very familiar and has not changed much from the previous years.	no			
252	n/c	no			
265	Page 26 Remove Key Concept Column Under UE1U1.6 - remove 'volcanos' and Under 4.E1U3.10 remove 'disasters, define the problem(s) and'. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes	standard	1. see comment 203 in third grade 2. Identify the causes and effects of natural hazards, define the problems and design solution to minimize those effects on humans.	
281	Nothing	no			
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
353	It makes total sense to move the study of rocks from 3rd to 4th grade. There are so many times that I have referenced the types of rocks in instruction about tectonics or erosion, and I get a lot of vague stares when I do, because students have forgotten that learning. Please keep that!	no			
355	I like rocks being moved to 4th grade from 3rd. It ties nicely with tectonic plates, earth quakes, and volcanoes.	no			
381	Make clearer connections between these standards.	no			
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	Key concepts		see comment 203 in third grade
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 203 in third grade
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1031	Climate change needs to be included				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fourth grader's level of understanding of the Theory of Evolution.				
1092	Standard 10: hazards is correct. Disasters only include extreme results of hazards and limits student understanding.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1186	See above.				
1196	See above				

1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	I don't teach 4th				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1305	Identify the causes and effects of natural disasters, define the problem(s), and design solution(s) to minimize those effects on humans. It is superfluous to add define the problem as that is included within the effects of natural disasters.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1336	The standards are heavy on Earth and Space and too light on Life Science. 4th grade students grasp biology concepts best. They struggle with concepts that are not as concrete, such as geosphere, mesosphere....etc The standard for 4.E1U2.6 is not developmentally appropriate for 9-10 year olds. I have been teaching 4th graders at a relatively middle class school for 15 years. The standards that students were able to learn best and keep their interest most engaged was our Ecosystems adaptations/Relationships unit. Atmospheric systems are too far removed for a 4th grader to understand. They struggle to understand weather fronts and air pressure in our current standards. Developmentally appropriate and age appropriate standards should be considered. Expecting students to master abstract concepts at 9-10 years old is unwise and uninformed about how children learn. Young students need to be able relate to their learning through observation and hands on activities. These standards need a thorough review with an eye towards developmental abilities to understand the concepts.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1464	Seismic waves...if you're going to throw in earthquakes then please include TSUNAMIS. Do you know how many kids in Arizona High schools have told me their teacher said tsunamis are caused by gravitational forces of the moon????? Terrible. So if we could clean up this misconception early then the world would appreciate this.				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				

1538	4.E1U2.4 - Seismic waves are the result of Earth movements; they transfer energy stored in rocks. What is not clear here is what you really want students to know about seismic waves. Do you want them to learn about how they are produced, they types of waves (S & P), how S&P waves impact human-engineered structures? The list of key concepts suggests that seismic waves affect mountain formation, where as it is mountain formation that produces seismic waves. A possible revision could be Use models to explain seismic waves, how they are produced, and how they transfer energy. I also question whether the focus on seismic waves is appropriate for 4th grade; the concept seems more appropriate for high school. Instead, maybe the 4th grade standard should really be about fast and slow changes in the Earth's surface.4.E1U1.5 is too broad. What types of interactions are important here? This could encompass weather, climate, water supply, ecology, all of geology, etc. Be more specific here. 4.E1U2.6 This standard should include not just evidence of past plate movements but also past environments. Furthermore, remove the word whether from this standard and replace it with how. 4.E1U2.7 seems similar to 4.E1U2.6 - could these two standards be combined?4.E1U4.9 This standard is too narrow. It should be about more than just the impact of water on life. It is really about the movement of water through connected systems. I suggest are revision that reads Construct an evidence-based argument about how water moves through environmental systems and how these movements impact life systems. 4.E1U4.9 - keep the word hazards and eliminate the word disasters. Hazards can be problematic but might not rise to the level of a disaster. For example, a rock fall might damage a highway but that is not a disaster on the scale of an earthquake or hurricane.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1681	The bullet point about 4th grade specifically on page 21. I feel the crossed out verbiage is preferable because it clearly indicated that there are cause and effect relationships between changes of resources and survival. Same thing goes for the crossed out verbiage on the top of page 25.				
1694	Only facts based on repeatable scientific tests.				
1709	Arizona is blessed with rich geologic formations that are exposed for easy study and exploration. The fourth grade earth and space standards need to focus more heavily on rocks and minerals as they relate to Arizona geology.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1877	Evolution!				

1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1923	Some of these standards are a bit too similar to middle school standards. I might expect a kid to know that there is an atmosphere around our planet, but to know the individual layers at this age seems a bit much. Same with the concept of using evidence to show that plate tectonics is real; that's definitely a MS standard. A fourth grader should simply know that the Earth's surface is broken into large plates and that there is actually crust under the oceans.				
1953	Teach proper evolution				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2112	Evolution is not described nor incorporated accurately. This must be changed.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	It appears that the use of the word whether in 4.E1U2.6 is intentional to undermine evidence of fossil record. Possible Solutions: 4.E1U2.6 - delete the word fossils . Limit this standard to tectonic evidence rather than fossil evidence since 4.E1U2.7 is about fossils. OR delete the word whether and insert how and then delete the entire 4.E1U2.& standard because it then becomes redundant. 4.E1.U2.8 add the words ...and changes in patterns over time or ...over various time scales.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2286	Reinstate evolution.				
2292	This seems not realistic for fourth grade: Plan and carry out an investigation to explore the interactions between Earth'smajor systems.Could this instead be: Plan and carry out an investigation to explore the interactions between human and natural systems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				

2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about Fourth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	How are earthquakes and seismic waves being addressed without discussion of plate tectonics as well as convection?				
2559	4.E1U1.5 This is WAY too broad.4.E1U2.7 This is part of 4.E1U2.64.E1U4.9 This standard does not align with E1 'The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate' The way it is written, it actually should be aligned with L2 'Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.'4.E1U3.10 The word 'disaster' is not appropriate. We call an incident a disaster solely because of its impact on people. The same event, like a flood, could be a hazard without being a disaster.				
2605	re 4.L4U4.12. Did you know that there is no such thing as a Species in scientific terms (just as there is no scientific definition of species there is no scientific definition of race btw.). Bringing the word species in here is a large mistake. The word Organisms is a more appropriate term to use. The original wording was much better than what you have here now.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
2642	this section is good				
2658	n/a				

Survey Question	39. What would you like the working group to consider as they revise the Life Science Standards in the Fourth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
56	4.L4U4.12 is the same exact standard as 1.L4U4.11.	yes	standard	remove from first grade- doesn't align well there.	
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	yes	standard	Leave 4L4U2.11 alone 4L4U4.12 should say Use evidence to support a claim about the factors that cause organisms to go extinct and how human can impact those factors	
124	n/a	no			
143	none	no			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
180	The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.	no			
189	A more clearer perimeters to teach within.	see comment 196			
196	at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.	no			
208	Simplification.	no			
218	align nicely with earth and space standards	no			
235	Our team would like to know why this skill could not be taught by the special area teacher... (P.E.) which is similar to how middle school and high teachers work with the students.	no			
252	n/c	no			
265	Page 27 Remove Key Concept Column	yes	Key concepts		see comment 203 in third grade
281	Nothing	no			
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			
353	These two standards are very vague and broad. A little clarification and/or some specific examples would be helpful. Are we to teach about every species across the entire history of the Earth?	yes	standard	no change	
355	Specify life ... all plants and animals on earth throughout history?The previous standard focused more on desert life which is easier to tackle.	yes	standard	no change	
381	Only adaptation and survival with a connection to the environment?	yes	standard	no change	
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes			see comment 203 in third grade
413	Fourth grade should be the point where, in biology, the diversity and relatedness of life should be introduced. Evolutionary concepts should not be left to later grades. Starting early helps students understand these complex processes in the future.	yes	standard	no change	already addressed
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	Key concepts		see comment 203 in third grade

1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1017	The inclusion of evolution must be reinstated.				
1020	Page 32, Table, Row labeled L4 â€” see comment 19 - #4.				
1031	Evolution needs to be taught				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fourth grader's level of understanding of the Theory of Evolution.				
1113	We need to start teaching children about all aspects of life including evolution from the very beginning.				
1147	Continuing with Evolution and leaving in biological evolution and natural selection.				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1190	Environmental studies should include information regarding human impact.				
1196	See above				
1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scienfic theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	I don't teach 4th				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.				
1296	Evolution should not be omitted from this curricula.				
1298	Ditto				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.				
1313	L4: The diversity of organisms, living and extinct, is the result of evolution was changed to The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. The original statement is clearer and should be retained.				
1315	Get a scientific expert to rewrite the content or undo the edits.				

1336	More standards for Life Science such as a specific standard for plant and animal adaptations so that students can better understand 4.L4U2.11. 9-10 year olds need more work on plant and animal adaptations RIGHT BEFORE they attempt to understand extinction, survival and mutations. Learning about this in previous years will not necessarily prepare students for higher level concepts. It should be retaught in 4th grade if it is introduced in prior grades.				
1337	The Internal Review provided excellent additional development and clarification. Especially important is how the Internal Review draft provides approaches that involve asking questions and understanding how arguments based upon evidence do aid the learning process. The Internal Review draft should be adopted.				
1338	What follows is repeated for grades 3-5 and is based on the Distribution... Table:' L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.'This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1500	They need to start learning about where they and everything came from, via evolution				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				
1538	4.L4U2.11 - this standard should include causes. Analyze and interpret environmental data that demonstrates how species adapt and survive or go extinct over time in response to environmental changes.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				
1672	See first comment				
1681	N/a				

1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Only facts based on repeatable scientific tests.				
1739	Continue to use evolution and not theory of evolution				
1787	The unity and diversity of organisms, living and extinct, is the result of evolution.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				
1793	Please do not muddy the language regarding evolution				
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1883	include evolution				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1926	Darwin, please.				
1929	L4Generally the life science standards seem less ties to the overall topics of the year and less ambitious, for third and fourth grade. In particular, with the focus in fourth grade on systems, it would be natural to talk more about ecological systems, food webs, connecting life cycles or food webs with cycles of water and energy on ecosystem scales, or talking about how food webs create interdependent communities, or how resources cycling also implies that one change in a resource or organism can impact many others. None of this seems to be mentioned anywhere in standards up to fourth grade despite such a focus on food chains and cycles for water and energy in standards				
1930	See #43 above				
1941	Introduced the word evolution as described by Charles Darwin at this level.				
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1953	Teach proper evolution				
1975	As part of understanding the difference in opinion and fact is should be clear that evolution is a fact.				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	Teach evolution as the scientific concept that it is and provide the data that supports the FACT that evolution drives diversity.				

2015	Micro-evolution.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	Evolution needs to be added back in as fact.				
2079	see previous comments.				
2111	See previous comments on the treatment of evolutionary biology.				
2112	Evolution is not described nor incorporated accurately. This must be changed.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	4.L4.U4.12 is almost worded the same as 1.L4U4.11 -- Possible solution: Include the learning progression in the right column to add clarity about the standard and expectations/boundaries. For instance: on pg. 165 of A Framework By end of grade 2 or End of grade 5 can add clarity.				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2210	Evolution must be taught				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2286	Reinstate evolution.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2416	If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.				

2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	Restore 4.L4U4.12 to original terminology.				
2490	Topics of adaptation, survival, and extinction are age-inappropriate and should be delayed until later grades.				
2515	see above				
2518	I couldn't care less about Fourth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	Without plate tectonics and historical evidence based on the scientifically documented eras how will determining causation for survival, extinction and adaptation be grounded in evidence and accurate?				
2543	TEACH EVOLUTION!				
2559	4.L4U2.11 Environmental data will not provide this evidence. To look at evidence of change in species, students would need to look at geological and climate data.				
2605	Same comments as 2nd grade				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
2642	this section is good				
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.				
2658	n/a				

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	41. What would you like the working group to consider as they revise the Fifth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
56	the word forces is used a lot in these 5th grade standards. the correct term should be force - gravitational force, magnetic force, etc.	yes	standards	no change	terminology is correct
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.	yes	standards	no change	evolution is not specifically addressed in 5th grade, focus is on heredity
124	n/a	no			
145	Return to original wording	no			
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	no			
170	Funding	no			
185	i fell like human development should not be allowed for this grade level	no			
186	Look at the content and make sure it is age and grade appropriate.	no			
188	They need to have age appropriate content and topics.	no			
189	A more clearer perimeters to teach within.	yes	standards	no change	The committee is considering assessment boundaries
192	I think that they are not ready to learn about reproduction	no			
193	I do not think that Human Reproduction and Life cycle is age appropriate for fifth grade. I also believe that this content should be reserved for each family to teach.	yes	standards	no change	
203	The Key concepts should be dropped from every grade level.	yes			see comment third grade 203
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	no			
218	with the number of physical science standards, it seems like this is the main focus for 5th grade.	no			
252	n/c	no			
265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards. Page 21Remove additions by ADE: 'and between content areas' and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	yes	introduction	1. 12,15, etc make it a separate document	
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			
292	Nothing in particular.	no			
326	Wait to Test.	no			
335	no suggestions	no			

354	There are an alarmingly high amount of discrepancies between the learning progressions. For example, 4.P4U4.3 discusses flow of energy from place to place. It also goes on to connect to standard 1.P3U1.3 which refers to pushing and pulling forces. While there are clear similarities, the depth of those similarities are FAR beyond what 4th graders would be capable of comprehending without more specific content knowledge. Additionally, in 5th grade, standard 5.P2U1.3 refers to constructing an explanation explaining forces (which connects to the first grade standard, but not electrical currents etc. in the 4th grade) and lists chemical bonds as a concept.. Unless 5th graders are learning college level chemistry and intermolecular forces. There is a HUGE disconnect between the wording of the standards and their connections due to some being macro concepts and some being micro concepts.	yes	standards	committee looks at the learning progression	
360	The life science standard which addresses reproduction and includes humans is not developmentally appropriate for 5th graders. They are not mature enough to have lessons and conversations about this topic. It should be moved to a different grade level, such as junior high.	yes	standards	no change	
363	1. The lack of detail could lead to districts teaching material differently or in different levels of depth. This could inadvertently lead to districts focusing on one topic of a standard and another district quickly skimming by it. This could lead to holes in the knowledge of students if students move from one district to another. 2. Studying scientific endeavors or current science investigations/discoveries would be beneficial to contribute to global minded thinkers. Students should know what's happening in the world around them. 3. Keep the Key Concepts! This will help with consistency across the state.				
365	The standard 5.L3U1.9 is unclear about to what extent the concepts will be covered. Reproduction is not an age appropriate concept for fifth graders, yet the standard includes humans.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
466	The curriculum and resources available	no			
476	Third grade often omits science from its curriculum. It is concerning as to how students will be prepared for fifth grade standards when they might not have gotten it in the lower grades.	no			
491	Inputting standards for engineering and technology - not just relationships. There are national standards for engineering and yet we ignore them. Our students get further behind because we have to do robotics in grade 3-5 afterschool.				
492	Write out the examples of topics instead of referring you to the previous grade(s).				
497	I like how the old standards were separated by content (ie chemistry, physics, etc) instead of just by science type. It's hard to distinguish at first glance how to separate them and they are hard to read.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				

1020	11. Page 29, 1st paragraph, 2nd sentence “Suggest not deleting 'that genetic information can be passed down from parent to offspring.' This fundamental life science concept should be introduced to grade school level students.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fifth grader's level of understanding of the Theory of Evolution.				
1092	This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands. Connections to other academic disciplines. Remove entirely from the document. This belongs in a support document or curriculum adopted locally. These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board. Additionally, many of the connections cited don't actually align to the standards within the grade level. Key concepts Column What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level. Remove they key concepts column from the document. If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science. Below is an example for 5.P1U1.2 Follow this process for each of the fifth grade standards, not just the example below. Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions: Measure and graph quantities such as weight to address scientific and engineering questions and problems. The amount of matter is conserved when it changes form, even in transitions in which it seems to vanish. No matter what reaction or change in properties occurs, the total mass/weight of the substances does not change. Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. Science assumes consistent patterns in natural systems.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1136	3				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1196	See above				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	I don't teach 5th, never have. We don't have time to meet with these other grades and figure out what needs to be done.				
1222	Not utilize language in re Darwinism, natural selection or evolution.				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1264	Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world. Sustainability in development and growth should be taught.				
1278	The key concepts go off on tangents not related to the standard or put an unnecessary focus on irrelevant aspects of the standard.				

1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1305	The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1384	By 5th grade the observations related to climate change should certainly be introduced. I'm not going to give explicit examples: there are many sources of such material				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1449	I really wish that they hadn't changed so much. For example. As a 5th grade science teacher, almost all of my Earth and Space science standards are now in the 6th grade standards per the draft. That leaves an entire quarter's worth of curriculum which now has to be changed and readjusted without any textbooks. Why did they move and change so much of the previous standards' content to different grade levels? I don't understand their reasoning.				
1517	Bring back the word evolution.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				
1548	See comments from previous on 5.L4U4.11				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1579	This seems to be the grade level when evolution is introduced, which seems a bit late in my opinion. Be that as it may, IT IS NOT A THEORY. Do NOT call it such, it is a fact.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1595	I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1639	Students need MORE SCIENCE in every level!				
1641	N/A				
1645	Sure up wording around evolution topic				
1660	Fix evolution standards.				
1664	See comment #9				
1681	Seems appropriate. No issues.				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1777	More critical thinking.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				

1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1922	Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as seeks to make clear the unity and diversity of living and extinct organisms is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is. The reason for renaming of the scientific method to science and engineering is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is. The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.				
1926	Darwin, please.				
1934	Abstract concepts such as density and atomic structure may be challenging for fifth grade students.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1953	Teach proper evolution				
1990	Evolution must continue to be taught				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2008	Seems too early to introduce the periodic table				
2013	In the introductory paragraph (pg 29) keep genetic information passed from parent to offspring. Does the Dept. of Education know something that the rest of the scientific community does not? Also in P1U1, remove the word atom from the text. We also cannot see electrons, proton, neutrons, etc.				
2015	Students need to be introduced to basic scientific literature.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				

2093	All of the grade level standards are less clear in this draft than they were in the 2004 version. Is there some way to organize updated scientific structure so it's not so clunky and redundant?				
2096	Add social sciences and sustainability				
2107	Genetic is not something 5th graders can understand at their age				
2112	Evolution is not described nor incorporated accurately. This must be changed.				
2115	Stronger emphasis on the scientific method. See my comments above for Grade Four.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2286	Reinstate evolution.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2383	Fifth graders are not ready for Reproduction standards. The earth science and matter standards pre-K their interest and they love it! The skeletal and muscular system is far more appropriate, Fifth graders are not mature enough for these standards and it will lead to further investigations that they aren't ready to hear in school!				
2384	Please revise.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2465	Get rid of the knowing and using science and key concepts. Integrate more the three dimensions of A Framework for K-12 Science Education.				
2471	evolution rather than theory of				
2487	Restore 5.P1U1.1 to original language.				
2512	too few standards				
2515	see above				
2518	I couldn't care less about Fifth Grade.				

2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2529	Include health standard that includes body awareness and human sexual education				
2539	Same as previous comments				
2543	TEACH EVOLUTION!				
2559	In fifth grade, students apply their understanding of scale at micro levels as they investigate changes in matter and at macro levels as they investigate patterns in space systems and environments. - In the internal review, space systems and environments is crossed out. This statement does not make sense when it is crossed out.				
2582	All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.				
2642	In a closed system should not be substituted for the words Universe				

Survey Question	42. What would you like the working group to consider as they revise the A Physical Science Standards in the Fifth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
89	No comment	no			
114	Evolution section is weak and watered down. It needs to be strengthened.				
124	n/a	no			
143	5.P1U1.1 in a closed system should be removed....the amount of matter stays the same, some may leave the system but leaving does not change the fact that you end with the same amount of matter that you started with when there is a chemical reaction				
145	5.P1U1.1 take out atom- this is 5th grade and particle is perfect. take out closed system- not necessary.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no			
162	Adopt NGSS standards	no			
170	Funding	no			
186	I really like #1- 5th grade is now really heavy on physical science standards. I am not trained on these specific science skills for all of these contents. There are concerns about adding this on if I don't understand it concepts myself.	no			
187	Teachers in 5th grade are not trained for this particular area in standards.				
188	This seems to be a very heavy topic you added to the standards. There is concern that teachers are not trained enough to teach this to kids.				
189	A more clearer perimeters to teach within.				
208	Simplification.				
218	the standards specifically state a closed system. Is any focus supposed to be paid to open systems?				

252	n/c				
265	Page 29In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.Remove Key Concept ColumnUnder 5.P1U1.1 remove '(atom)' and 'in a closed system' and under 5.P3U3.5 remove 'and design solutions'. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.				
281	Nothing				
292	Nothing in particular.				
326	Wait to Test.				
335	no suggestions				
360	There should be a balance between the 3 sections of science but physical science has 6 standards, earth only has 2 and life has 3.				
363	So many Physical Science Standards! In the 4th Grade there's so many Earth & Space Standards. Perhaps balance the material out better so each grade level isn't as heavy in one type of science.				
365	Consider that the current draft is very heavy in physical sciences for fifth grade.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
466	The curriculum and resources available				
476	Assuming that students already have electricity and magnetism when there is no guarantee that third grade will even teach it. At our school, primary levels rarely teach science content.				
491	Where us STEM (Science, Technology, Engineering and Math)				
497	Separate them. Make them more specific.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1020	Page 32, Table, Row labeled P4 â€” see comment 19 - #3.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fifth grader's level of understanding of the Theory of Evolution.				
1092	Standard 1: Atom is a word students at this grade level can memorize, not understand. The addition of closed system doesn't make sense as inserted. The amount of matter stays the same whether you are in a closed system or not - it just doesn't all stay within the system. Huge difference. Please do not create student misconceptions.				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1196	See above				
1203	Those writing these standards should be experts in science and/or education.At a minimum they should understand what the word THEORY means in scientific terms.Eg: Evolution is a confirmed scienfic theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory				
1219	Get rid of intelligent design. Restore references to evolution.				

1221	I have never taught 5th grade				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1297	5.P1U1.1 says Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see (atom) and in a closed system, if properties change or reactions occur, the amount of matter stays the same. This standard combines two big ideas (particulate nature of matter and conservation of matter); they should be two different standards. Furthermore, 6.P1U1.3 states Develop and use models to demonstrate that matter is made up of smaller particles called atoms. It seems that 6.P1U1.3 should be before 5.P1U1.1 and that 5.P1U1.1 should be in 6th grade and just address conservation of matter.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1304	I would put in more physical science since children can intuitively understand Newton's laws at this age.				
1305	Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see (atom) and, in a closed system, if properties change or reactions occur, the amount of matter stays the same. The addition of the word atom assumes that it is scientifically impossible to see an atom, which is not true.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1449	There is SO MUCH information to be covered in Physical Science for 5th grade and very little in the other science subjects. I wish this was better balanced.				
1517	Ditto.				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				
1538	5.P3U3.6- Energy is always present. This standard should read Analyze and interpret data to determine how and where energy is transferred when objects move.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				
1664	See comment #9				

1681	N/a				
1694	Only facts based on repeatable scientific tests.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1934	This is going to be very challenging for fifth grade students. Teachers need scaffolding and ample support. These concepts (atomic structure or solutions/suspensions) are going to be tough. Teachers also need to make sure there is TIME in their day to teach Science as it is frequently pushed to the wayside in elementary settings.				
1953	Teach proper evolution				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2093	See items 38 and 41 above.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	Delete the word atom in 5.P1U1.1 -- evidence for deleting this term can be found on pg 108 of the Framework. Boundary: at this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism... Key terms are not accurate for 5th grade level (nice to know, but not have to know)Key Terms are not necessary (appropriate) based upon the Framework pg. 108 -- please delete terms				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution, omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			

2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2487	Restore 5.P1U1.1 to original language.				
2515	see above				
2518	I couldn't care less about Fifth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2543	TEACH EVOLUTION!				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2642	this section is good				

Survey Question	43. What would you like the working group to consider as they revise theA Earth and Space Science StandardsA in the Fifth Grade Science Standards?				
Comment #	Public Comment	Item Addressed	Actionable Yes/No	Potential Changes	Refinement Note
56	page 30 - 5.E2U2.8 - Gravity is NOT directed down to the Earth. Gravitational pull pulls to the center, and if strong enough out of the other way (Black Hole). OnEarth, Gravity feels like it is directed down, but it is not down . the word is misleading and teaching inaccurate concept of gravity.				
89	No comment				
114	Evolution section is weak and watered down. It needs to be strengthened.				
124	n/a				
143	5.E2U2.8Why add towards the center of the spherical Earth, are we really allowing the individuals that believe the earth is flat to influence our state standards?				
145	5E2U2.8 Must we feed into the flat Earth people?				
155	More focus with engineering and computer science in these areas.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
170	Funding				
172	to link to the physical science standards about matter, once again consider a standard that addresses the atoms (elements) that make up the minerals that then make up rocks that are the crust of the earth.				

186	The space topics have been limited. They don't teach as much as they used it. The students used to get to spend a lot of time with space and kids at this age are so fascinated with space and love it.				
187	I don't think that there is enough being taught in the new space standards. I think that space is a fascinating subject and it really gets the student to engage.				
188	Bring back the space you removed.				
189	A more clearer perimeters to teach within.				
208	Simplification.				
218	5.E2U2.8 ignores the fact that other celestial bodies have a gravitational pull as well. Do we focus on the gravitational pull of the sun in keeping the planets in orbit? What about the moon and tides in relation to earth's gravity? I would recommend moving several of the 6th grade standards to 5th grade so teachers can go deep into these concepts rather than floating along the surface. Depth is better than breadth!				
252	n/c				
265	Remove Key Concept ColumnsUnder the paragraph on Earth and Space Sciences, remove 'position', under 5.E2U2.8 remove '(towards the center of the spherical Earth)', and under 5.L3U1.9 remove 'can' and 'the' that were all added by ADE. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.				
281	Nothing				
292	Nothing in particular.				
326	Wait to Test.				
335	no suggestions				
360	Additional Earth and Space standards should be added and Physical standards should be removed in order to create a balance for each discipline.				
363	These standards are nicely written, developmentally appropriate and students find these topics interesting in 5th Grade!				
365	It seems that the idea of gravity is repetitive when including it in physical science as well as Earth and Space				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
466	The curriculum and resources available				
476	These standards seem to make a bit more sense.				
491	Where is STEM - the engineering part				
497	Needs more depth. Make standards more clear as patterns in space can cover a lot of information				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
1001	Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1031	Climate change needs to be included				
1050	Page 29, Fifth Grade Introduction: patterns of Sun, moon, and stars(!) Note that, unfortunately, other than in Second Grade there is nothing that mentions the Sun as a star and the properties of stars (something that probably could have been introduced earlier than high school)Page 30, 5.E2U2.8: As with grade 2, to me, 'gather' implies making observations (and looking up as appropriate) while 'obtain' can mean looking it up in a book or on the Internet.				

1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fifth grader's level of understanding of the Theory of Evolution.				
1092	Standard 8: the parenthetical statement does not add anything to this standard				
1113	Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1196	See above				
1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Never taught 5th				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do not do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1449	I wish more of what used to be in 5th grade standards could be taken out of the 6th grade earth and space science from the draft and added back in.				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				
1660	Fix evolution standards.				

1664	See comment #9				
1681	N/a				
1694	Only facts based on repeatable scientific tests.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				
1793	Please do not muddy the language regarding evolution				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1875	Include direct mention of evolution and scientifically rigorous treatment of evolution!				
1877	Evolution!				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1953	Teach proper evolution				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				
2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2015	Ambivalent.				
2032	Evolution				
2043	All standards need to be included.				
2062	No comment.				
2079	see previous comments.				
2093	See items 38 and 41 above.				
2112	Evolution is not described nor incorporated accurately. This must be changed.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	Include Evolution (where relevant), omit Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2286	Reinstate evolution.				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				

2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				
2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2426	Make sure the students know that geological changes to the earth can take millions or even billions of years.				
2428	Stick to actual science and stop dumbing down our children!				
2487	N/A				
2515	see above				
2518	I couldn't care less about Fifth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2543	TEACH EVOLUTION!				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2618	I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.				
2642	this section is good				

Survey Question	44. What would you like the working group to consider as they revise theA Life Science Standards in the Fifth Grade Science Standards?				
Comment #	Public Comment	Item Addressed	Actionable Yes/No	Potential Changes	Refinement Note
89	No comment				
114	Evolution section is weak and watered down. It needs to be strengthened.				
124	n/a				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
170	Funding				
185	human development should not be allowed at this grade level				
186	Reproduction traits are not appropriate for 5th grade students. Some of these concepts are political and can become tricky in a 5th grade classroom.				

188	Human reproduction is NOT grade level appropriate. Also some of the new concepts here are political. Should not be taught in the classroom.				
189	A more clearer perimeters to teach within. As well as teaching about reproduction in humans in a basic scientific concept.				
208	Simplification.				
218	These 3 standards to not fit well with one another. 5th graders can't handle discussing body parts, let alone the affects of genetics on individuals. Will teachers need to use punnett squares to teach? This is very vague and worrying. The idea of teaching selective breeding to 10-11 year olds is not okay. We can't handle talking about how babies are made, yet we are going to talk about breeding?				
252	n/c				
265	Remove Key Concept ColumnsUnder the paragraph on Earth and Space Sciences, remove 'position', under 5.E2U2.8 remove '(towards the center of the spherical Earth)', and under 5.L3U1.9 remove 'can' and 'the' that were all added by ADE. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.Page 32In cell L1, U1, remove 3.L1U1.5 (see comment above about this standard).In cell L1, U2, rename to 3.L1U2.5 (new number)In cell L2, U2, rename to 3.L2U2.6 (new number)In cell L2, U1, rename to 3.L2U1.7 (new number)In cell L2, U3, rename to 3.L2U3.8 (new number)In cell P4, U2, add 4.P4U2.1				
266	Please revise the standard for 5.L3U1.6. They are too vague. There is no indication of how deep to take this standard. The key concepts column needs to remove reproduction as it applies to humans (and even animals). This age group is not ready for such lessons.				
281	Nothing				
292	Nothing in particular.				
326	Wait to Test.				
335	no suggestions				
360	The idea of including humans in standard 5.L3U1.9 should be removed from the standard. It is not developmentally appropriate as students are not mature enough to have a discussion on this topic.				
363	1. Remove the reproduction standards. I believe 5th Graders lack the maturity to understand the concept and don't believe it's developmentally appropriate. These could also be controversial and some families may prefer to teach this material in the home. 2. The jump from teaching the Skeletal System in 3rd Grade to Life Cycle, Reproduction and Genetics in 5th is a huge jump. How will students retain the information they were taught 2 years prior and what happens if it wasn't taught?				
365	Consider the vast difference in what is being currently taught-including muscular, skeletal, nervous systems to just reproduction. Consider that reproduction is not an age appropriate concept.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
466	The curriculum and resources available				
472	They are excellent, supporting not only content knowledge scientific argumentation and scientific practices.				
476	Consider the major changes in the grade levels that you are making. In the current standards, fifth grade has skeletal, muscular and nervous systems. Under the new standards, only reproduction, life cycles, and genetics are included. That's a really big jump.				
497	reproduction traits may not be appropriate for all 5th grade students as human growth and development varies by district and may not be taught until the end of the year. Is this in conjunction with the health standards? Is it different? Is it less specific? More information needs to be given				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				

516	Some of the topics lead to discussions about evolution-- I personally don't have a problem with that, however, that is not always fully supported by the public.				
1008	Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.				
1017	The inclusion of evolution must be reinstated.				
1020	Page 32, Table, Row labeled L4 "see comment 19 - #4.				
1031	Please teach about evolution too				
1032	L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. See my comments on earlier page.				
1085	Evolution is not just a theory, it is well established fact by science. Making Biological evolution to Theory of Evolution is a step backwards not an improvement.				
1091	A fifth grader's level of understanding of the Theory of Evolution.				
1092	Standard 10. Can is an inappropriate addition. Changes to an environment DO affect the development of traits. Always! It may be at a negligible level, but it is ALWAYS at some level.				
1113	We need to start teaching children about all aspects of life including evolution from the very beginning.				
1164	1.L3U2.9, and the identical standard in grades 5 and 8 ignore that some plants, notable two important desert plants, creosote and agaves, can also reproduce through cloning, producing plants that are genetically identical to the parent plant.				
1165	No comment				
1167	That school is for teaching facts, not for promoting the views of any particular religious group.				
1190	Environmental studies should include information regarding human impact.				
1196	See above				
1203	Those writing these standards should be experts in science and/or education. At a minimum they should understand what the word THEORY means in scientific terms. Eg: Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory				
1219	Get rid of intelligent design. Restore references to evolution.				
1221	Never taught 5th				
1223	Nothing in the proposed revisions for any grade are acceptable if they include intelligent design or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as only a theory.				
1226	Don't revise.				
1252	Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.				

1260	Science standards 5.L3U1.9, 5.L3U2.10, and 5.L3U3.11 are incompletely described and it is not clear how they are integrated. The current standards are written so that environmental change could be interpreted as a direct driver of the development of adaptive traits in the phenotype or genotype of an organism over a lifetime and passed to offspring. Experience teaching evolutionary concepts in tier 1 general education at the University of Arizona suggests to me that this is a common misconception among Arizona students. A correct and unambiguous conception of evolution is an essential for understanding science standards HS.L3U2.28, HS+B.L3U2.15, HS.L4U2.31, HS.B.L4U1.19, and HS.B.L4U2.20. Life science standards dealing with genetics, natural selection, and evolution should disambiguate the transmission of variability, the relative fitness of traits in a particular environment, and change in the frequency of traits over many generations. The concept described by these standards is more accurately summarized here. The chances of survival and reproduction (fitness) of organisms with different traits determines the frequency of traits in a population (natural selection). Variability in traits on which natural selection acts arise randomly in individuals and are genetically determined. Natural selection on variation results in the adaptation of populations to an environment and evolutionary change over many generations.				
1296	Evolution should not be omitted from this curricula.				
1298	Same as before.				
1303	Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.				
1307	In 5.L3U2.10, the addition of can seems to be added in an attempt to downplay the role that environmental effects have on development of traits, though this could be an honest clarification. Also, the addition of the just makes the sentence clunky.				
1309	I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.				
1311	The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with intelligent design she should be removed from office and barred from working in education for life. Do jot do this.				
1315	Get a scientific expert to rewrite the content or undo the edits.				
1337	The Internal Review provided excellent additional development and clarification. The Internal Review draft expands the thought processes of teachers and students in this area. The Internal Review should be adopted.				

1338	What follows is repeated for grades 3-5 and is based on the Distribution... Table:' L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.'This is imprecise. In each section this should read 'The study of evolution seeks to demonstrate' First, evolution is an established scientific theory. A scientific theory differs from the 'street' use of theory, which indicates a 'guess' about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.Two things distinguish evolution as a 'scientific theory' from the more general use of 'theory.' First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven. Thus it is the STUDY of evolution " mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to 'test' the underlying theory) " that have provided evidence of 'the unity and diversity of living and extinct organisms.'				
1339	Clearly include the teaching of the concept of evolution.				
1366	Original language should remain				
1403	Teach evolution. Evolution is science.				
1443	evolution should be included in all grades				
1449	Selective breeding, genetic information, adaptations, and mutations seem like heavy subjects to be learned in 5th grade. I think this is too young a grade for some of these subjects to be learned, not quite academically appropriate yet. Not sure how specific or in depth we are supposed to get either since the standards are not specific enough.And body systems which is only addressed in 3rd grade per the new science standards draft should be added back into 5th or 6th grade as it was before. (5th grade used to have Central Nervous system, brain, skeletal and muscular systems)				
1500	They need to start learning about where they and everything came from, via evolution.				
1517	Ditto				
1518	EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.				
1526	Climate change, evolution, and big bang cosmology should be in these standards.				
1538	5.L3U2.10 - The wording in this standard is teleological and suggest that these changes can happen quickly. Remove the word the from ...affect the development of traits... Suggested revision: Construct an explanation based on evidence for how changed in an environment can affect the development of traits within a population of organisms over generations. This standard is also similar to 8.L4U2.11 and it is unclear what the boundaries are for the 5th-grade version.				
1553	See above				
1556	Remove all religious references.				
1575	NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.				
1579	This seems to be the grade level when evolution is introduced, which seems a bit late in my opinion. Be that as it may, IT IS NOT A THEORY. Do NOT call it such, it is a fact. Teach it as a fact.				
1583	Adding and maintaining teaching Evolution needs to be continued.				
1603	See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.				
1628	Teach Science and facts in Schools not faith and religion.				
1641	N/A				
1645	No comment.				

1660	Fix evolution standards.				
1664	See comment #9				
1672	See first comment				
1675	De-emphasis of evolution does not advance science education. There is no scientific controversy about evolution.				
1681	N/a				
1689	See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.				
1694	Only facts based on repeatable scientific tests.				
1739	Use the word 'evolution' and not 'theory of evolution'				
1787	The unity and diversity of organisms, living and extinct, is the result of evolution.				
1789	No need. Go with the scientific evidence not creationism or religious indoctrination!!				
1793	Please do not muddy the language regarding evolution				
1795	Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes. Please don't avoid education on evolution.				
1796	Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.				
1799	Teach Evolution				
1800	The original document, before internal review, provided the necessary background about what core concepts were expected in science education.				
1811	Revert all of Diane Douglas's changes.				
1859	Continue to teach evolution. Do not remove it to teach creationism.				
1875	Include direct mention of evolution and scientifically rigorous treatment of evolution!				
1883	include evolution				
1890	Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.				
1918	Refer to my response to question 17.				
1926	Darwin, please.				
1929	5.L3U1.9 'patterns between the offspring' doesn't make grammatical/wording sense. 5.L3U2.10 Biology distinguishes between 'development' within the life of individual organisms, i.e. going from egg to adult, and 'evolution', which describes change at a population level over generations. It seems here what is meant is evolution, not development, so the term should be replaced. (that would match with key concepts and mention of population, as well as long term patterns and genetic change mentioned in adjoining standards)				
1934	I like these a lot.				
1944	Strengthen the teaching of evolution and global change to reflect the science of these subjects.				
1945	Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.				
1953	Teach proper evolution				
1968	keep the evolution.				
1975	By 5th grade students need to understand the evolution is a fact. Not an opinion or theory.				
1995	Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.				

2000	Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.				
2013	Evolution is NOT a theory!!!!Evolution as a theory is a religious belief, not a scientific concept.				
2015	Ambivalent.				
2030	L4				
2032	Evolution				
2043	All standards need to be included.				
2062	Evolution needs to be added back in as fact.				
2079	see previous comments.				
2093	See items 38 and 41 above.				
2111	See previous comments on the treatment of evolutionary biology.				
2112	Evolution is not described nor incorporated accurately. This must be changed.				
2152	We should only be covering evolution in school. Creationism should be kept separate from schools.				
2156	5.L3U2.10 Revise standard to Construct an explanation based on evidence that changes in an environment can affect the frequencies of traits in a population of organisms. Reasoning: biologist mainly apply development to the life process of an individual organism, not to changes of the frequencies of traits in populations				
2199	Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2203	Don't eliminate references to evolution, as it's necessary to understand life sciences.				
2208	Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.				
2210	Evolution must be taught				
2259	Send the standards back for review.				
2262	Explain evolution.				
2265	include Evolution, omit ANY MENTION OF Creationism and Intelligent Design .				
2273	Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.				
2286	Reinstate evolution.				
2292	This seems abstract for fifth grade: Construct an explanation based on evidence that changes in an environment can affect the development of the traits in a population of organisms.Consider deleting that. What would this look like for fifth grade?				
2306	Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and Intelligent Design into the state science standards.				
2345	Refer reply in 20 above.				
2354	.....			
2364	Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.				
2378	Needs to go back to review.				
2380	Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.				
2384	Please revise.				

2390	Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.				
2416	If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.				
2419	I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word may in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)				
2428	Stick to actual science and stop dumbing down our children!				
2469	5.L3U2.10 currently reads Construct an explanation based on evidence that changes in an environment can affect the development of the traits in a population of organisms. This is inaccurate, confusing development with evolution . Development occurs within an organism, evolution does not. I think it should read Construct an explanation based on evidence that changes in an environment can affect the evolution of the traits in a population of organisms.				
2487	N/A				
2490	Topics of genetic inheritance and effects of the environment on traits should be delayed until high school.				
2515	see above				
2518	I couldn't care less about Fifth Grade.				
2520	Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.				
2539	How will this create a solid knowledge without taking into account cells, cell division, and genetic trait linkage to chromosomes and DNA?				
2543	TEACH EVOLUTION!				
2605	Same comments as 2nd grade				
2607	Do not attempt to deny or water down the concepts of evolution.				
2615	STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!				
2642	Language on evolution needs to make it clear what evolution is and why it is important, not to obscure that information.				
2653	I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.				

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

Survey Question	46. What would you like the working group to consider as they revise the Sixth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on life science!	No	K-12 Progression		
56	the word forces is used a lot. it should be force not forces	Yes	Other	Grammatical Change	
60	Some of these standards our students need to know how to divide and multiply and our students do not know how to do that in 6th grade	Yes	Key Concepts	Take out mathematical wording in Key Concepts	Standard 6.P3U2.4
65	There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels.	Yes	Introduction	Add to Intro	
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Standards		Not in 6th grade standards
124	Standard 6.P4U3.5 should be moved to 8.P4U3.5, because it does not connect well with 6th grade content and would go better with 8th grade content.	Yes	K-12 Progression		See comment #177
137	There are many aspects of the current standards that were cut that are important.	No	K-12 Progression		
140	I think it is best to keep it on one topic...life science and weather	No	K-12 Progression		
145	Opening paragraph must be returned to original.	No	K-12 Progression		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		
162	Why physical science standards will be difficult for 6th graders to understand; not mature enough; not enough background/prior knowledge; most haven't had Science in elementary school (elem teachers tend to put Science and Social Studies to the side to focus on Math and ELA).	Yes	Standards	Change "Demonstrate" to "Represent"	Standard 6.P1U2.3
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	No	Standards		
170	Funding	No	Other		
177	Grade 6 needs to be addressed as it has 16 standards compared to an average of 10-12 for other grade levels. When one begins to unwrap those standards, there are numerous learning targets. There will simply be too many learning targets to effectively teach to the degree of depth desired. Reeves (2002) suggests having no more than 13 power standards to determine what is most important. This, in theory, means three standards in 6th grade may not be addressed ever.	Yes	Standards	Consider moving standards	
183	Where is the connection between each sub-category? What is the big idea/unit/overall theme? It is unclear, the concepts are a little randomly thrown together.	Yes	Other	Label the Cross-Cutting Concepts in the intro	6-8th grade headings
185	more specifications	No	Key Concepts	Re-write	
187	I think that it is a little much.	No	Other		
192	Moderate revisions	No	Other		
194	#NAME?	No	Other		Find comment in the survey
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts	Re-write	See comment #164
208	Simplification.	No	Other		Too vague

210	The standards should involve just the life science units	No	K-12 Progression		
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	No	Other		
218	Many districts consider 6th grade to be part of the elementary school rather than the middle school. The number of standards they are expected to cover at the detail indicated seems too much to cover in one year. Several of the 6th grade standards are more appropriate for lower grade levels as it would allow depth of instruction rather than breadth of instruction. This would also allow for depth in 6th grade, too.	Yes	K-12 Progression		See comment #177
219	Sixth grade should cover related topics like Earth, Space and Environmental Sciences.	No	K-12 Progression		
250	Teaching about cells and the atom within the same year will be too much for 6th graders. They are two abstract concepts that students will have difficulty understanding.	No	K-12 Progression		
258	There is too large of a gap in between when the students start learning about atoms and then start learning about stoichiometry.	No	K-12 Progression		
265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	Yes	Introduction	Revise last sentence of the grade level introduction	6-8th grade introductions
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	No	Other		
281	Nothing	No	Other		
291	They seem to split hairs. E1U1.6 fits better as a concept in the 7th grade hydrological cycle than with anything in the 6th grade standards.	Yes	K-12 Progression		See comment #177
292	Nothing in particular.	No	Other		
321	kits align to standards	No	Curriculum		
335	no suggestions	No	Other		
340	Earth science all year is perfect for this age group.	No	K-12 Progression		
348	I would like the working group to update the current (2004) standards, not gut and rewrite them.	No	Other		
366	Look at the groupings of concepts, they are not cohesive. The standards are progressive in nature from fifth grade to sixth grade but I don't think that sixth graders are ready cognitively to grasp the new physical science standards. The importance of basic background concepts/information will be key to student success and needs to be addressed. Some type of document or articulation needs to be included to show the correlation of math concepts needed for students to be successful in reaching the science standards.	Yes	Key Concepts		See comment #60
367	Some type of document or articulation needs to be included to show the correlation of math concepts needed for students to be successful in reaching the science standards.	Yes	Key Concepts		See comment #60

377	I am not selecting for grades 6 and up as I don't feel I have enough experience to make recommendations for this level student.	No	Other		
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See comment #203
418	With the expectations placed on teachers for ELA Blocks, Math instruction, and intervention time, I don't know how on earth 50 daily minutes of instruction can be dedicated to Science. Yeah, yeah, integration - but when students are constantly pulled out of classes and moving for different services and programs, that makes integration a real challenge. Or some students simply lose out on instruction.	No	Curriculum		
433	Grade levels should be specialized so content makes sense and deeper thinking can take place. When you stretch out a curriculum too much you lose that deep understanding	No	K-12 Progression		
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #203
527	Space science should remain in 7th or 8th grade. The abstract concepts need a foundation which is not there.	No	K-12 Progression		
551	Reverting to previous standards.	No	Other		State Department Directive

Survey Question	47. What would you like the working group to consider as they revise the Physical Science Standards in the Sixth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on life science.	No	K-12 Progression		
56	page 34 - 6.P3U2.4 - force not forces	Yes	Other	Grammatical change	
60	Our kids will need to have a background knowledge of atoms and who is going to teach them	No	Other		
108	In 6.P1U1.1, the key concepts of buoyancy and density do not fit within the standard of states of matter. They are important concepts, but have nothing to do with change of state. 6.P4U3.5 implies energy is a thing.	Yes	Key Concepts	Re-write	
111	Sixth grade students will have a hard time to think abstractly about small particles such as atoms. Not developmentally appropriate. Move to 8th grade.	Yes	Key Concepts		See comment #205
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Standard		Not addressed in 6th grade
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		
162	Adopt NGSS standards	No	Other		
170	Funding	No	Other		

183	Potential and Kinetic energy is random, does not flow with the rest of the unit and states of matter. These concepts are also way above a 6th grader's level of understanding. Many of these concepts are currently in the high school level classes.	Yes	Standard	Consider moving standard	Standard 6.P4U3.5
187	I don't think its appropriate for this Grade level I think it should be left for 5th grade	No	K-12 Progression		
194	-potential and kinetic energy is random-does not flow with the rest of the unit and states of matter-concepts are not cohesive-way above 6th grade level.	Yes	Standard		See comment #183
208	Simplification.	No	Other		
218	The focus on atomic structure and effects seems appropriate for 6th grade.	No	Other		
219	Sixth grade should cover related topics like Earth, Space and Environmental Sciences.	No	K-12 Progression		
245	Students are not ready for the Bohr Model, Atom Structure, or John Dalton.	Yes	Key Concepts		See comment #205
250	Teaching the Bohr model should be taught in 8th grade.	Yes	Key Concepts		See comment #205
258	The atoms conversation should be moved to 7th grade.	Yes	K-12 Progression	Consider	
265	Page 34 In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for. Remove Key Concept Column	Yes	Key Concepts		See comment #205
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
321	Field Trips which would support overall learning and incorporate necessary life skills to work effectively within a team model.	No	Curriculum		
335	no suggestions	No	Other		
366	Hard to see the learning progression in this area and how concepts are connected, also science concepts are too advanced for 11-12 year olds. Brain development needs to be taken into account and also a reasonable time frame to teach these advanced concepts.	Yes	Key Concepts	Remove Bohr Model, John Dalton	
367	The vertical articulation needs to be considered to ensure students have the pre-requisites needed to continue seamlessly into their next year of physical Science	No	K-12 Progression		
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See comment #205
433	Work on specializing current standards and skills. Not spacing them out.	No	Other		State Department Directive
491	Engineering	No	Other		Too vague
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #205
527	Creation of energy / Laws of motion / Temperature, heat	No	K-12 Progression		
551	Providing resources, materials, and key vocabulary terms.	No	Curriculum		

Survey Question	48. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Sixth Grade Science Standards?
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Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on life science.	No	K-12 Progression		
56	page 35 - 6.E2U1.7 - force not forces	Yes	Standard	Grammatical change	
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Standard		Not addressed in 6th grade
143	6.E2U1.8 analyze and interpret data When you analyze data aren't you interpreting it? This seems redundant to me. I would recommend removing the word interpret.	No	Standard		Taken from the Framework
155	More focus with engineering and computer science in these areas.	No	K-12 Progression		Computer science will have own standards
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		Do not know which ones were changed
162	Adopt NGSS standards	No	Other		
170	Funding	No	Other		
187	Is appropriate	No	Other		
194	#NAME?	No	Other	Find actual comment	
208	Simplification.	No	Other		Too vague
218	The standards on gravitational force and the solar system better align with the 5th grade standards. rather than spreading them out, put them together. Depth is better than breadth!	No	K-12 Progression		
219	Sixth grade should cover related topics like Earth, Space and Environmental Sciences.	No	K-12 Progression		
250	This should be taught in 7th grade	No	K-12 Progression		
265	Page 35 Remove Key Concept Column	Yes	Key Concept	Re-write key concepts	
274	Need to add climate change and humans impact on the planet. Students need to learn early the effect they are having on this system.	No	Curriculum		
281	Nothing	No	Other		
291	6.E2U2.11 is the same standard and concept as 5.E2U1.7.	No	Standard		
292	I think space is too broad a topic to be taught in sixth grade. Their comprehension of it will become more real in 7th.	No	K-12 Progression		
321	Continue with SIMS field trip within Mesa Public District	No	Curriculum		
335	no suggestions	No	Other		
366	The vertical articulation needs to be considered to ensure students have the necessary background knowledge needed to continue seamlessly into their next year of Earth and Space Science.	No	K-12 Progression		
367	The vertical articulation needs to be considered to ensure students have the pre-requisites needed to continue seamlessly into their next year of Earth Science	No	K-12 Progression		
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concept		See comment #254
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concept		See comment #254

527	Bodies of Water ... water / energy from the sun are a substantial foundation needed ! (sun, moon, earth)	No	Curriculum		
551	Providing resources, materials, and key vocabulary terms.	No	Curriculum		

Survey Question	49. What would you like the working group to consider as they revise the Life Science Standards in the Sixth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
65	For 6.L1U2.15 Construct an explanation to demonstrate the relationship between major cell structures and cell functions (plant and animal). the major divisions in types of cells are between prokaryotes and eukaryotes, not plants and animals. Bacterial cell structure needs to be included here.	No	Curriculum		
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Other		Not addressed in 6th grade
143	6.L1U2.13 Carry out an investigation... Do 6th grader have the developmental ability to safely carry out this investigation and are 6th grade classrooms equipped with the safety protocols to do this? I know our district is not	Yes	Standard	Change "carry out an investigation" to "Develop and use a Model"	Standard 6.L1U2.13
145	6.L1U2.13 This is not appropriate on several levels. 1. Our schools are not set up for students in 6th grade to do these kinds of investigations. 2. Develop and Use a model to explain that all living things... would be much more appropriate.	Yes	Standard		See comment #143
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		Do not know which lines were changed
162	Adopt NGSS standards	No	Other		
170	Funding	No	Other		
183	Why does photosynthesis get thrown into the other concepts because it has a word cell . It should be it's own concept.	Yes	Standard	Rewrite to "Construct an explanation for the process of photosynthesis in cells"	Standard 6.L1U2.13
194	#NAME?	No	Other	Review actual comment	
208	Simplification.	No	Other		Too vague
218	The focus on photosynthesis seems out of place in this area.	Yes	Standard		See comment #183
219	Sixth grade should cover related topics like Earth, Space and Environmental Sciences.	No	K-12 Progression		
250	This should stay the same	No	Other		Too vague
265	Page 36 Under 6.L1U2.13 - remove 'Carry out an investigation to provide evidence' and under 6.L1U2.15 remove '(plant and animal)'. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.	Yes	Standard	Place "Plant and Animal cells" inserted after the verb.	See also comment #143
274	Add investigate each body system and how they interact with one another to maintain life.	No	Curriculum		
281	Nothing	No	Other		

291	These standards are the only set that seem well put together and thought out to be used as a flowing unit by teachers.	No	Other		
292	Nothing in particular.	No	Other		
321	None	No	Other		
335	no suggestions	No	Other		
366	This section of the 6th grade standards appears to be the most cohesive of the three. Background knowledge and essential knowledge from prior grades needs to be built upon.	No	Other		
367	The vertical articulation needs to be considered to ensure students have the pre-requisites needed to continue seamlessly into their next year of Life Science	No	K-12 Progression		
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See comment #183
413	Once again, why is evolution missing? This is a central idea in biology and yet the 6th grade standards leave it out completely.	No	Curriculum		
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #183
527	structure and functions of living organisms.	No	Curriculum		
551	Providing resources, materials, and key vocabulary terms.	No	Curriculum		

Survey Question	51. What would you like the working group to consider as they revise the Seventh Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on earth science.	No	K-12 Progression		
65	There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels.	Yes	Introduction	Add to introduction	
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
123	Maybe adding back Space and removing Physical	No	K-12 Progression		
140	I think it is best to keep it earth science and similar throughout the year for better understanding	No	K-12 Progression		
143	While looking at the linear distribution of Earth Space Science standards (7/8th grade) I became concerned with the standard 7.E1U2.5According to the explanation: Students should develop an understanding of the role of heat energy in warming the Earth and driving cycles in weather and climate. How does the standard 7.E1U2.5 help them do this? Plate tectonics should not be included in these standards.	Yes	Standard	Move to 8th grade	Standard 7.E1U2.5
145	Go back to the original first paragraph	No	Other		Too vague
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		Do not know what was changed
162	Newton's Laws are difficult to learn; again-maturity isn't there yet; would have to reteach the concepts when you get to 8th grade.				
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	No	Other		
170	Funding	No	Other		
172	Add a standard that once again goes addresses learning about how rocks form and how to identify them. Even if it has been covered in the earlier grades, I guarantee they will not remember how to go through the process of identifying them. This provides great opportunities to teach many of the skills needed in doing science: observation, testing, recording data and identification.				
187	Newtons Law fits appropriate	No	Other		
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts	Re-write key concepts	
208	Simplification.	No	Other		Too vague
210	The seventh grade should cover geology and astronomy and weather	No	K-12 Progression		
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	No	Standards		
219	7th grade should cover just Life Science. Please just adopt NGSS standards.	No	Standards		

222	Concern: Teaching Physics Content in 7th Grade Teachers believe that the students in 7th grade do not have enough math content knowledge to adequately perform in physics. Additionally, rate of change is a concept generally taught in 8th grade and directly relates to the physics formulas. Solution: Keep Physics Standards in 8th Grade Our PLC strongly believes that physics is a topic much better suited for 8th grade curriculum. All of us who have taught 8th grade for many years know that even in 8th grade, students struggle with deciphering the formulas and understanding the rate of change of speed or velocity. Additionally, we believe that any Earth science concepts should continue to be taught in 7th grade so that there is ample time to continue to teach physics in 8th. Research for Concern/Solution: Tina Chuek (ell.stanford.edu) suggests providing student learning experiences that integrate skills and knowledge across grade levels. Keeping physics in 8th grade will ensure an integrated approach to learning for students. Additionally, see 8.EE.B.5 and 8.F.B.4 and their correlation with Motion and Forces.	Yes	Standard	To address public concern regarding grade level content: Move 7.P3U2.3 to 8th & move 8.P4U1.3 and 8.P4U1.4 to 7th grade	
238	Math concepts may be too difficult and some of the topics might complement areas covered either before or after grade 7...	Yes	Key Concepts	Remove reference of math	
245	They aren't ready for the math involved in physics the connection could be much greater if they physics was left in 8th grade and the space science in 7th grade.	Yes	Standard		See comment #222
250	7th grade should continue to focus on earth and space science.	No	K-12 Progression		
257	Ensure grade level math is supportive	Yes	Key Concepts	Remove reference of math	
265	Page 9, 21, 33 Remove last sentence: 'Suggestions for key concepts...or maximum content limits.' Pages 12, 15, 19, 24, 28, 31, 37, 41, 45 Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	Yes	Introduction	Revise last sentence of the grade level introduction	6-8th grade introductions
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	No	Other		
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
340	Life science is perfect for this age group	No	Other		
373	As stated previously, moving force and motion to this grade level makes not sense. It needs to stay with the 8th grade curriculum. Also, the age of the earth curriculum makes more sense being associated with fossils and plate tectonics.	Yes	Standards		See comment #222
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See comment #203

402	Moving Force and Motion into 7th grade is not a good idea because mathematically they are not ready for these concepts and it does not fit with the rest of their curriculum. Keeping it in 8th grade is a better fit with Chemistry and Energy. This will provide more cohesion within the concepts.	Yes	Standards		See comment #222
404	Keep force and motion in 8th grade. It does not fit the 7th grade curriculum. Students are not mathematically ready for the equations and concepts. The force and motion and Newton's Laws fits best with Energy and Chemistry units.	Yes	Standards		See comment #222
405	The concepts in motion and Newton's laws being taught in the 7th grade is a bad idea because the students are not prepared for those concepts. These concepts should be taught in the 8th grade.	Yes	Standards		See comment #222
406	Mathematically students will not be ready to handle the force and motion formulas etc. In addition, it is a better fit with 8th grade's energy and chemistry. This ensures uniformity with the concepts.	Yes	Standards		See comment #222
433	Same as 6th	No	Other		Too vague
449	Newton's Laws. I don't think students will be there with their math skills.	Yes	Standards		See comment #222
451	Change the wording to make it more friendly to 7th grade students.	No	Curriculum		
463	I believe the standards are too high in rigor for the first year of implementation, I believe the first couple years will be rough	No	Standards		
472	Force and Motion is not appropriate for 7th grade. Students need mastery of mathematics standards that are not taught until 8th grade (specifically algebra, slope, and two step equations) in order to successfully master speed, velocity, acceleration, momentum, and Newton's 2nd law - all of which fall in Force and Motion.	Yes	Standards		See comment #222
484	With AIMS only being 4th and 8th.. back off of the vague scientific process standards. This year is a great opportunity to learn actual science.. not just scientific thinking.	No	Standards		State Department Directive
499	Consider not adopting the Force and Motion standard and keep it in 8th grade because 7th grade is not mathematically ready for the equations and the force and motion standard fits more closely for the standards in 8th grade.	Yes	Standards		See comment #222
509	Remove force and motion and put it as an 8th standard. Students in 7th aren't ready for the math and concepts that are involved. Force and motion standard works well with energy and chemistry. These three topics intertwine with each other and should all three be taught together in the 8th grade. Add back the 7th Earth Science standard of age of the earth. This must be taught in order to understand fossils and geological processes.	Yes	Standards		See comment #222
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #203
513	It would be helpful if there was continuity between the standards. A reason to be teaching all disciplines of science in one year.	No	K-12 Progression		
527	It lacks depth and breadth.	No	Standards		

529	There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth. Also moving the force and motion/Newton's laws standard from 8th to 7th is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.	Yes	Standards		See comment #222
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Survey Question	52. What would you like the working group to consider as they revise the Physical Science Standards in the Seventh Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on earth science.	No	K-12 Progression		
56	page 38 - 7.P2U1.1 - force not forcesuse the words attract and repel - consider revising the wording of this standard.	Yes	Standards	Change grammar mistake	
108	7.P3U2.3 is a HUGE amount of information and content. You might consider breaking it out into more standards.	No	Curriculum		
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
143	Remove standards 7.E1U2.5 it does not help students develop an understanding of the role of hear energy in warming the Earth and driving cycles in weather and climate.	Yes	Standards	Change heading of the Earth and Space to: Students develop an understanding of the results of energy flowing and matter cycling within and among the Earth's system. (Taken from Framework pg. 181)	
145	7E1U2.5 Seems like this was just stuck in for someone preference since the focus of 7th grade is weather and climate. Not connected or relevant to weather and climate.	Yes	Standards		See comment #143
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do not know what was changed
162	Adopt NGSS standards	No	Standards		
170	Funding	No	Other		
208	Simplification.	No	Other		Too vague
219	7th grade should cover just Life Science. Please just adopt NGSS standards.	No	K-12 Progression		

222	Concern: Teaching Physics Content in 7th Grade Teachers believe that the students in 7th grade do not have enough math content knowledge to adequately perform in physics. Additionally, rate of change is a concept generally taught in 8th grade and directly relates to the physics formulas. Solution: Keep Physics Standards in 8th Grade Our PLC strongly believes that physics is a topic much better suited for 8th grade curriculum. All of us who have taught 8th grade for many years know that even in 8th grade, students struggle with deciphering the formulas and understanding the rate of change of speed or velocity. Additionally, we believe that any Earth science concepts should continue to be taught in 7th grade so that there is ample time to continue to teach physics in 8th. Research for Concern/Solution: Tina Chuek (ell.stanford.edu) suggests providing student learning experiences that integrate skills and knowledge across grade levels. Keeping physics in 8th grade will ensure an integrated approach to learning for students. Additionally, see 8.EE.B.5 and 8.F.B.4 and their correlation with Motion and Forces.	Yes	Standards		See comment #222
245	Students are not ready for the abstract and often complex mathematical practices associated with physics.	Yes	Standards		See comment #222
250	The physics standards should be focused in 8th grade because they are able to understand the concepts. The majority of the AzMerit is heavily tested on physics, but the majority of it is taught in 7th grade,	Yes	Standards		See comment #222
257	Introducing physics may be tricky as forces and motion are complex areas for the 7th grade.	Yes	Standards		See comment #222
265	Page 38 In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for. Remove Key Concept Column	Yes	Key Concepts		See comment #203
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
389	Adding force and motion to seventh does not allow students to fully grasp the concepts in math that are necessary to understand each concept.	Yes	Standards		See comment #203
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See comment #203
402	Moving Force and Motion into 7th grade is not a good idea because mathematically they are not ready for these concepts and it does not fit with the rest of their curriculum. Keeping it in 8th grade is a better fit with Chemistry and Energy. This will provide more cohesion within the concepts.	Yes	Standards		See comment #203
404	Keep force and motion in 8th grade. It does not fit the 7th grade curriculum. Students are not mathematically ready for the equations and concepts. The force and motion and Newton's Laws fits best with Energy and Chemistry units.	Yes	Standards		See comment #203
405	The concepts in motion and Newton's laws being taught in the 7th grade is a bad idea because the students are not prepared for those concepts. These concepts should be taught in the 8th grade.	Yes	Standards		See comment #203

406	Mathematically students will not be ready to handle the force and motion formulas etc. In addition, it is a better fit with 8th grade's energy and chemistry. This ensures uniformity with the concepts.	Yes	Standards		See comment #203
449	Again, Newton's Laws. I don't think they are appropriate for middle school at all. It think they should be taught in High School.	Yes	Standards		See comment #203
463	Randomly inserted, doesn't relate much to anything else	No	K-12 Progression		
472	Force an Motion is not appropriate for 7th grade. Students need mastery of mathematics standards that are not taught until 8th grade (specifically algebra, slope, and two step equations) in order to successfully master speed, velocity, acceleration, momentum, and Newton's 2nd law - all of which fall in Force and Motion.	Yes	Standards		See comment #203
499	Consider not adopting the Force and Motion standard and keep it in 8th grade because 7th grade is not mathematically ready for the equations and the force and motion standard fits more closely for the standards in 8th grade.	Yes	Standards		See comment #203
509	Remove force and motion and put it as an 8th standard. Students in 7th aren't ready for the math and concepts that are involved. Force and motion standard works well with energy and chemistry. These three topics intertwine with each other and should all three be taught together in the 8th grade. Add back the 7th Earth Science standard of age of the earth. This must be taught in order to understand fossils and geological processes.	Yes	Standards		See comment #203
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #203
527	Renewable / non renewable resources	No	Curriculum		
529	There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth. Also moving the force and motion/Newton's laws standard from 8th to 7th is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.	Yes	Standards		See comment #203

Survey Question	53. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Seventh Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
123	yes, I believe and feel they go together.	No	Other		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do not know which ones were changed

162	Adopt NGSS standards	No	Standards		
170	Funding	No	Other		
172	Add a standard for identifying and classifying rocks/minerals and their uses. Especially important as in 8th grade they will need this information to create a model that explains geologic time, scaffolding	No	Curriculum		
208	Simplification.	No	Other		Too vague
219	7th grade should cover just Life Science. Please just adopt NGSS standards.	No	Standards		
250	The earth and space standards should be expanded.	No	K-12 Progression		
257	I like this set.	No	Other		
265	Page 39 Remove Key Concept Column Remove 7.E1U2.5, and renumber 7.E1U3.6 to .5 and all of the 7.L 7-11 to 6-10. Since it is in green, the teacher's did not indicate that this is a standard that should be taught at the 8th grade level.	No	Key Concepts		See comment #143
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
364	The very few standards left of earth science at this grade level are all random: The cycles (including atmosphere, which is taught in 6th grade) Plate tectonics which relates to Earth's interior, as well as rocks, minerals, volcanoes, and earthquakes, none of which are taught at all in 7th grade Weather?	Yes	Standards		See comment #143
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts	Re-write key concepts	
475	more space science	No	Curriculum		
499	Take away the age of the earth and add it back to 7th grade because it makes no sense not to teach about the age of the earth when teaching about fossils and geological processes.				
509	Add back the 7th Earth Science standard of age of the earth. This must be taught in order to understand fossils and geological processes.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See comment #390
513	It would help for students to see more of a tie in to the life sciences and physical sciences. For instance, how are landslides affected by the rock cycle or how does the rock cycle affect the carrying capacity.	No	Curriculum		
527	environmental science / space - solar system planets/ gravity/ etc... weather possibly to tie in with seasons...	No	Curriculum		
529	There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth.				

Survey Question	54. What would you like the working group to consider as they revise the Life Science Standards in the Seventh Grade Science Standards?				
Comment #	Public Comment	Item Addressed	Actionable Yes/No	Potential Changes	Refinement Note

7	Should focus on earth science.	No	K-12 Progression		
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
123	I feel and think it looks good the way its presented	No	Other		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do now know what was changed
162	Adopt NGSS standards	No	Standards		
170	Funding	No	Other		
208	Simplification.	No	Other		Too vague
219	7th grade should cover just Life Science. Please just adopt NGSS standards.	No	Standards		
238	laws of motion, forces/physics should come later...	Yes	Standards		See comment #203
250	Where it says refer to standard should be explained more. The standard does not offer enough information.	Yes	Key Concept		See comment #390
257	I think this set hits the mark.	No	Other		
265	Page 40Remove Key Concept Column	Yes	Key Concept		See comment #390
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concept		See comment #390
413	Why is the relatedness of life missing? Ecology is introduced, yet not evolution, even though both of these are inseparable. The interdependence of organisms and their environment can only be understand in the context of evolution.	No	Curriculum		
484	No life science in 7th or 8th	No	K-12 Progression		
499	Take away the age of the earth and add it back to 7th grade because it makes no sense not to teach about the age of the earth when teaching about fossils and geological processes.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concept		See comment #390
527	not much here.. ecosystems	No	Curriculum		

Survey Question	56. What would you like the working group to consider as they revise the Eighth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on physical science.	No	K-12 Progression		
9	Align the standards in such a way that the students have time to get the appropriate learning prior to taking the standardized test in the spring. The way it is now the testing comes before teachers have time to teach all of the necessary contents that's included on the test. Having said that, I hoping the group will create a more updated test and eliminate the very antiquated AIMS test.	No	Other		
26	In eighth grade students should be learning the basics including evolution and bio diversity	No	Curriculum		
31	Do not remove the term evolution from the standards.	No	Curriculum		
45	Please follow the National science education standards.	No	Other		
65	There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels.	Yes	Introduction	Add this to the introduction	
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
124	Standard 8.E1U16 about rocks and fossils should go to 7.E1U2.5 because it is out of place in 8th grade standards and fits logically with 7th grade.				
140	I think 8th grade science should still remain all physical science...chemistry and physics (looks like Newton's laws are not on the 8th grade draft?)	Yes	Standards	To address public concern regarding grade level content: Move 7.P3U2.3 to 8th & move 8.P4U1.3 and 8.P4U1.4 to 7th grade	
143	The Earth and Space section says that students will explore natural and human-induced changes in Earth systems over time. The 7th grade standard 7.E1U2.5 would fit better in this section then were it currently is. (plate tectonics)				
145	Go back to the original paragraph	No	Other		Too vague
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do not know what was changed
162	Earth History is usually taught in 7th with 8th grade focusing on Genetics, Chemistry, and Forces (Newton's Laws). Those units are more difficult to learn and 8th grade has the maturity to learn and understand the concepts.				
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	No	Other		
170	Funding	No	Other		
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts	Re-write key concepts	
208	Simplification.	No	Other		Too vague
210	This should cover physics, chemistry, and genetics				
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	No	Standards		
219	8th grade should just adopt on topic like Physical Sciences. See NGSS standards.	No	Standards		

222	Concern: Teaching Physics Content in 7th GradeTeachers believe that the students in 7th grade do not have enough math content knowledge to adequately perform in physics. Additionally, rate of change is a concept generally taught in 8th grade and directly relates to the physics formulas.Solution:Keep Physics Standards in 8th GradeOur PLC strongly believes that physics is a topic much better suited for 8th grade curriculum. All of us who have taught 8th grade for many years know that even in 8th grade, students struggle with deciphering the formulas and understanding the rate of change of speed or velocity. Additionally, we believe that any Earth science concepts should continue to be taught in 7th grade so that there is ample time to continue to teach physics in 8th. Research for Concern/Solution:Tina Chuek (ell.stanford.edu) suggests providing student learning experiences that integrate skills and knowledge across grade levels. Keeping physics in 8th grade will ensure an integrated approach to learning for students. Additionally, see 8.EE.B.5 and 8.F.B.4 and their correlation with Motion and Forces.	Yes	Standards		See comment #140
250	The standards need to be revised.	No	Standards		Too vague
258	I am concerned about the large gap between when the atom conversation starts and where 8th grade is supposed to pick it back up again.				
261	moving physics back over to 8th grade	Yes	Standards		See comment #140
265	Page 9, 21, 33Remove last sentence: 'Suggestions for key concepts...or maximum content limits.'Pages 12, 15, 19, 24, 28, 31, 37, 41, 45Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.	Yes	Introduction	Revise last sentence of the grade level introduction	6-8th grade levels
279	I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	No	Other		
281	Nothing	No	Other		
290	get rid of the space standards	No	K-12 Progression		No space standards exist in 8th grade
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
340	Physical science is perfect for this age group.	No	Other		
341	See earlier comments.	No	Other		Too vague
351	Be more explicit with what the standard means.	No	Other		
358	The 8th grade science standards, as they are in the new proposed standards, are not appropriate to the needs of Arizona students. There needs to be a greater focus on the physical sciences, such as chemistry and physics. Students are not prepared for the content of chemistry and physics before reaching the 8th grade level as they are proposed on the new standards. In order to appropriately prepare Arizona 8th grade students to be successful in high school, the physical sciences need to be the focus in the 8th grade year.	No	K-12 Progression		

371	The 8th grade science standards are very disjointed and lack any kind of connectivity. There are standards that do not appear to belong with the standards, such as the geological column to communicate ages of rock layers and fossils. The 8th grade standards seem incomplete and not all appropriate to the grade level being assessed (without guaranteed background knowledge being taught in previous years) such as the wave characteristics and interactions using mathematical models. The Key Concepts listed as not appropriate to the grade level as well, such as the covalent and ionic bonds, chemical formulas (with exception of basic compound formulas), wavelength, amplitude, and frequency.	No	Curriculum		
373	Force and motion needs to stay in 8th grade because the students are more mathematically equipped to handle it and it flows into the other subjects of energy and chemistry. Also, it is continued on in 9th grade so there is a natural flow that will be lost if it gets moved to 7th grade.	Yes	Standards		See comment #140
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See Comment #203
402	Moving Force and Motion into 7th grade is not a good idea because mathematically they are not ready for these concepts and it does not fit with the rest of their curriculum. Keeping it in 8th grade is a better fit with Chemistry and Energy. This will provide more cohesion within the concepts.	Yes	Standards		See comment #140
404	Keep force and motion in 8th grade. It does not fit the 7th grade curriculum. Students are not mathematically ready for the equations and concepts. The force and motion and Newton's Laws fits best with Energy and Chemistry units.	Yes	Standards		See comment #140
405	The concepts in motion and Newton's laws being taught in the 7th grade is a bad idea because the students are not prepared for those concepts. These concepts should be taught in the 8th grade.	Yes	Standards		See comment #140
406	Mathematically students will not be ready to handle the force and motion formulas etc. In addition, it is a better fit with 8th grade's energy and chemistry. This ensures uniformity with the concepts.	Yes	Standards		See comment #140
433	Same as 6th	No	Other		Too vague
472	Standard 8.1EU3.7 is not appropriate among the rest of the 8th grade curriculum. These concepts are disjointed and out of place among the rest of the science standards for this grade. I cannot imagine how fractals would pertain to the remaining standards, and in fact, they do not have much merit being a science standard at all. there are many more applicable math concepts that can be reinforced in science as standards, for example algebra/slope (force and motion), ratios (genetics), carbon dating/exponential decay (chemistry).	Yes	Key Concepts	Revise and remove math reference	
475	Space science back to 7th grade	No	Standards		Space is not in 8th grade
499	Keep force and motion in the 8th grade standard because this standard works well with the concepts of chemistry and energy. Also, in 9th grade science, high schoolers take chemistry and physics so it is a nice foundation for the physics/chemistry class they take in 9th grade.	Yes	Standards		See comment #140

509	Remove force and motion from 7th and put it as an 8th standard. Students in 7th aren't ready for the math and concepts that are involved. Force and motion standard works well with energy and chemistry. These three topics intertwine with each other and should all three be taught together in the 8th grade. Add back the 7th Earth Science standard of age of the earth. This must be taught in order to understand fossils and geological processes.	Yes	Standards		See comment #140
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See Comment #203
513	There is not enough if a joining of the disciplines. How does the models created also help to explain the physics or impact on living organisms.	No	Curriculum		
529	There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth. Also moving the force and motion/Newton's laws standard from 8th to 7th is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.	Yes	Standards		See comment #140

Survey Question	57. What would you like the working group to consider as they revise the Physical Science Standards in the Eighth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards. Evolution section is weak and watered down. It needs to be strengthened.	No	Other		
114	8.P4U1.3The word store is not a common word used, what is meant by this? Is this referring to all types of potential energy, there needs to be some clarification here.Also renewable and nonrenewable resources not power types...inaccurate (key concepts)	No	Curriculum		
143		Yes	Standard	Change "store" to "source"	Standard 8.P4U1.3
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do not know what was changed
162	Adopt NGSS standards	No	Other		
170	Funding	No	Other		
208	Simplification.	No	Other		
219	8th grade should just adopt on topic like Physical Sciences. See NGSS standards.	No	Other		

222	Concern: Teaching Physics Content in 7th GradeTeachers believe that the students in 7th grade do not have enough math content knowledge to adequately perform in physics. Additionally, rate of change is a concept generally taught in 8th grade and directly relates to the physics formulas.Solution:Keep Physics Standards in 8th GradeOur PLC strongly believes that physics is a topic much better suited for 8th grade curriculum. All of us who have taught 8th grade for many years know that even in 8th grade, students struggle with deciphering the formulas and understanding the rate of change of speed or velocity. Additionally, we believe that any Earth science concepts should continue to be taught in 7th grade so that there is ample time to continue to teach physics in 8th. Research for Concern/Solution:Tina Chuek (ell.stanford.edu) suggests providing student learning experiences that integrate skills and knowledge across grade levels. Keeping physics in 8th grade will ensure an integrated approach to learning for students. Additionally, see 8.EE.B.5 and 8.F.B.4 and their correlation with Motion and Forces.	Yes	Standard		See comment #140
245	The more difficult concepts of physics are left for 7th grade. While 8th grade adapts from the previous years knowledge. Physics needs to be left for 8th grade.	Yes	Standard		See comment #140
250	Should include more about Newton's Laws and motion and instead of energy.	Yes	Standard		See comment #140
258	This grade should have all Chemistry standards inside of it to compensate for the fact that the two year gap is going to have a large effect on their understanding of the topic coming in.	No	Curriculum		
265	Page 42In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.Remove Key Concept Column	Yes	Key Concepts		See Comment #203
281	Nothing	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
340	Include the math.	No	Other		Too vague
341	Keep them the way they were. They work. It is easier to incorporate more standards like waves into Force and Motion than to teach in isolation like you are now asking.	Yes	Standard		See comment #140
358	Matter (chemistry) and Physics (newton's laws/force and motion) need to be moved back into the 8th grade year. they are not prepared cognitively or academically to be able to master these concepts before their 8th grade year. These standards being taught in the 8th grade year would be most appropriate to prepare Arizona students to be successful in high school. The standards should be grouped by core ideas, not by cross-cutting concepts.The Key-Concepts should not be included in the standards as they are written, as they do not match the needs of the students or are appropriate to the content being taught	Yes	Standard		See comment #140
371	The new energy standards that have been added to the 8th grade standards seem very standalone without the previous physics standards. They do not seem to have any connection with the other standards in the new 8th grade standards. Adding Energy to 8th grade is a positive, but it needs to have more to connect to, such as additional physics standards (force and motion).	Yes	Standard		See comment #222

389	Force and motion standards need to be incorporated in this grade level because students are learning the same math that goes hand in hand with the concepts that are necessary to grasp in science.	Yes	Standard		See comment #140
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		See Comment #203
402	Moving Force and Motion into 7th grade is not a good idea because mathematically they are not ready for these concepts and it does not fit with the rest of their curriculum. Keeping it in 8th grade is a better fit with Chemistry and Energy. This will provide more cohesion within the concepts.	Yes	Standard		See comment #140
404	Keep force and motion in 8th grade. It does not fit the 7th grade curriculum. Students are not mathematically ready for the equations and concepts. The force and motion and Newton's Laws fits best with Energy and Chemistry units.	Yes	Standard		See comment #140
405	The concepts in motion and Newton's laws being taught in the 7th grade is a bad idea because the students are not prepared for those concepts. These concepts should be taught in the 8th grade.	Yes	Standard		See comment #140
406	Mathematically students will not be ready to handle the force and motion formulas etc. In addition, it is a better fit with 8th grade's energy and chemistry. This ensures uniformity with the concepts.	Yes	Standard		See comment #140
475	Newtons laws need to be included in 8th grade curriculum.	Yes	Standard		See comment #140
499	Keep force and motion in the 8th grade standard because this standard works well with the concepts of chemistry and energy. Also, in 9th grade science, high schoolers take chemistry and physics so it is a nice foundation for the physics/chemistry class they take in 9th grade.	Yes	Standard		See comment #140
509	Remove force and motion from 7th and put it as an 8th standard. Students in 7th aren't ready for the math and concepts that are involved. Force and motion standard works well with energy and chemistry. These three topics intertwine with each other and should all three be taught together in the 8th grade.	Yes	Standard		See comment #140
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts		See Comment #203
527	Mathematical models for force / motion / speed etc.. Chemistry - from building blocks to reactions	No	Curriculum		
529	Please don't move the force and motion/Newton's laws standard from 8th to 7th. This is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.	Yes	Standard		See comment #140

Survey Question	58. What would you like the working group to consider as they revise the Earth and Space Science Standards in the Eighth Grade Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes

7	Should focus on physical science	No	K-12 Progression		
45	Please follow the National science education standards.	No	Other		
111	Move space to 7th grade.	No	Other		No space in 8th grade
114	Evolution section is weak and watered down. It needs to be strengthened.	No	Curriculum		
143	The Earth and Space section says that students will explore natural and human-induced changes in Earth systems over time. The 7th grade standard 7.E1U2.5 would fit better in this section then were it currently is. (plate tectonics)	Yes	Standards		See draft standards A1 Pg. 39
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Other		We do not know what was changed
162	Adopt NGSS standards	No	Other		
170	Funding	No	Other		
172	How about predicting geologic processes...rather than hazards...these processes are only hazards when people or the things they build are in the way. Consider flooding: to the ancient Egyptians, flooding was a blessing, not a hazard! Standard 8 implies that the consumption of resources by humans is bad for the Earth. And then the reasonable conclusion is that the earth is better off without humans? Truly believe we need to conserve, but also need to educate the students about the positive side of resource consumption: in this age, in the developed world because of resources we live to the age of 80+, can travel into space and can communicate into space. If you go back to the stone age: average life span, 25 year, travel 25 miles in a day and communicate over the distance that the human voice travels! So need to be certain all sides of resource consumption are considered.	Yes	Standards	Find a better word	
208	Simplification.	No	Other		Too vague
219	8th grade should just adopt on topic like Physical Sciences. See NGSS standards.	No	Other		
238	Fossils/rocks and geologic time earlier in the sequence (grade ??)	Yes	Standards	Consider moving	
245	The standards would make more sense with the new 7th and 6th grade standards. 7th and 6th grade should share the earth and space standards for middle school together.	Yes	Standards	Consider moving	
250	The earth and space standards are oddly placed and do not flow with the rest of the standards that are listed. Refer to standards need to offer more of an explanation, because the standard is broad. We need guidance on what to teach.	Yes	Standards	Consider moving	
265	Page 43Remove Key Concept Columns	Yes	Key Concepts		See Comment #203
281	Nothing	No	Other		
290	need to get rid of	No	Other		
292	Nothing in particular.	No	Other		
335	no suggestions	No	Other		
340	Reference to what they learned in 6th grade	No	Curriculum		
341	We dont need to teach one small standard about geology. That can becovered in 7th grade when they teacher geology and changing enviromonents	Yes	Standards	Consider moving	

358	The Earth and Space science standards should be moved to the 6th grade year. This would be more appropriate to the cognitive and academic progress that students should have made by this year. The standards should be grouped by core ideas, not by cross-cutting concepts. Key-Concepts should not be included in the standards as they are written, as they do not match the needs of the students or are appropriate to the content being taught				
371	The 8th grade Earth and Space science have no connection to any of the other standards, especially the standard about developing and using a geological column to communicate relative ages of rock layers and fossils (8.E1U1.6). This is the only standard that has anything to do with the structure and age of the earth. The standard about obtaining, evaluating, and communicating information about technologies that use data and historical patterns to predict natural hazards (8.E1U3.7) seem like it would be more appropriate with a weather standard or where seismology is being taught as part of the larger curriculum. The standard about constructing and supporting an argument about how human consumption of limited resources impact the geosphere (8.E1U4.8) do connect with the natural selection standards in the life science.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
416	For 8.E1U1.6 - Develop and use a model of Earth's geological column to communicate relative ages of rock layers and fossils. It needs to include information about determining absolute age, not just relative ages of rock.				
449	Geologic-Time Scale. Students at this age have a hard time thinking about the past and future. To teach students Geologic Time Scales and Era's would be hard for their minds to wrap around and grasp.				
472	Seismology would fit much more sensibly in 7th grade.				
475	Move to 7th grade				
499	Remove the standard for teaching the age of the earth and put it back into the 7th grade standard as it flows with teaching fossils and geological processes.				
509	Remove the Earth Science standard of age of the earth. This must be taught in order to understand fossils and geological processes which are taught in the 7th grade.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
513	There is great tie ins to modeling but the standards are still disjointed.				
527	none... need to focus on the big stuff!				
529	I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth.				

Survey Question	59. What would you like the working group to consider as they revise the Life Science Standards in the Eighth Grade Science Standards?
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Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
7	Should focus on physical science.				
26	As above Do not remove concepts like evolution from teaching				
31	Do not eliminate the term evolution from the standards. It is a key science term and it is unnecessary to edit this standard in the way it was for the internal review version of the standards.				
45	Please follow the National science education standards.				
56	page 44 - 8.L4U2.12 - why aren't we using the words adapt and evolve? this seems like someone just doesn't want to use the actual term/vocabulary. adapting and evolving is exactly what it is				
65	8.L4U2.12 SHOULD be worded Gather and communicate evidence on how the process of natural selection provides an explanation of how new species can evolve. Natural selection is the primary mechanism of evolution and the wording should not be removed.				
114	Evolution section is weak and watered down. It needs to be strengthened.				
145	Life science statement should go back to original. Develop and use a model to explain natural selection- this is all that needs to be stated. 8.L4U2.12 should say: Gather and communicate evidence on how the process of natural selection provided an explanation of how new species an evolve.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
170	Funding				
208	Simplification.				
219	8th grade should just adopt on topic like Physical Sciences. See NGSS standards.				
238	Use caution when introducing evolution among a variety of species. Will this relate to human evolution?				
245	Stated previously.				
250	this is organized well.				
265	Page 43Remove Key Concept ColumnsUnder 8.E1U1.6 remove 'Develop and', under 'Life Sciences' paragraph, remove 'how traits within populations change over time', and under 8.L3U4.10 remove 'or not'. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.Page 44Remove Key Concepts ColumnWhy is there a blank row above 8.L4U2.12?What did the teachers have for 8.L4U2.12, if anything? Restore it to what the teachers asked for.Page 46In cell E1, U2 remove 7.E1U2.5In cell E1, U3 rename 7.E1U3.6 to .6 (renumber)Renumber 7.L...7 to .6, .8 to .7, .9 to .8, .10 to .9, .11 to .10 (renumber)				
281	Nothing				
292	Nothing in particular.				
335	no suggestions				
341	Keep genetics and heredity here as a prep for HS				

358	The life science standards should be moved to the 7th grade year. This would be more appropriate to cognitive and academic progress of the students at this point. It would also begin to prepare Arizona students to be successful in high school. The standards should be grouped by core ideas, not by cross-cutting concepts. Key-Concepts should not be included in the standards as they are written, as they do not match the needs of the students or are appropriate to the content being taught				
371	The life science standards are appropriate, but additional adaptations standards should be added back, to help support the natural selection standards (8.L4U2.11 and 12)				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
402	Moving Force and Motion into 7th grade is not a good idea because mathematically they are not ready for these concepts and it does not fit with the rest of their curriculum. Keeping it in 8th grade is a better fit with Chemistry and Energy. This will provide more cohesion within the concepts.				
404	Keep force and motion in 8th grade. It does not fit the 7th grade curriculum. Students are not mathematically ready for the equations and concepts. The force and motion and Newton's Laws fits best with Energy and Chemistry units.				
406	Mathematically students will not be ready to handle the force and motion formulas etc. In addition, it is a better fit with 8th grade's energy and chemistry. This ensures uniformity with the concepts.				
475	Information for thewe stards is fine.				
484	No life science.. stick with chemistry and physics				
499	Remove the standard for teaching the age of the earth and put it back into the 7th grade standard as it flows with teaching fossils and geological processes.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
527	genetics and heredity				
529	Life Science standards seem solid				

HS Standards
as they apply
to Earth and
Space Science:

Survey Question	61. What would you like the working group to consider as they revise the High School Essential Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
19	Evolution, the Big Bang, and the billion year old age of the Earth must be accurately represented in this standards! Religion has no place in the classroom.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
24	As stated before, no removal of words which carry conflicting messages for those with religious beliefs. Teach your religion at home.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
31	Do not remove the terms evolution and big bang theory. These are key science terms that are part of the science community and should be taught using the correct terminology. There is no reason to edit these standards to not include these terms.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
40	The Big Bang is a fundamental part of science like the theory of evolution. Keep religion and god out of the science or you will create very confusing students with no place is today work environment.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
43	They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
49	The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.

61	HUGE CONCERN In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018. Evolution is a HUGE part of biology and should not be something to fear....especially when knowledge of mechanisms of biological evolution are helping to create so many life saving medicines and helping us to understand biological life. We really need to get over seeing this word as a threat.				
65	1. We should require four credits of science in high school in order to make sure our students are truly competitive with those from other states. The breadth of the standards here are good, but trying to achieve that in three years inevitably will lead to a shallow understanding of some of them. 2. There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels. 3. Many of the edits introduced during the Douglas internal review damage the rigor of these standards by obscuring or minimizing core concepts in science such as evolution through natural selection, explanations of cosmological evolution through the big bang theory, and man's impact on the environment and climate change. 4. The inclusion of the key concepts lists returns us to the old model of science as a noun, instead of effective research-based model of science as a verb using inquiry and experimentation and emphasizing the processes of science. The key concepts list should be part of a document detailing the state assessment, not this standards document.	1. No 2. Yes 3. Yes 4. Yes	2. other standards Concepts	3. 4. Key	2. state use of metrics in science in introduction. 3. see comment 19 4. none 4. ADE directed to be included.
66	Add in species evolution and the Big Bang	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
67	The deletion of evolution and Big Bang theory need to be included in these standards	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
69	Include evolution and the Big Bang theory.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
83	No! Bring back all scientific theories!	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.

86	Make sure that fundamental science concepts that will prepare students for college are taught; including evolution & the big bang theory.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
89	Core, not essential.	Yes	other	replace word "core"	Core indicates central focus of standard
92	Why are they not core standards? If it generates an opportunity for high school credit, keep the name.	Yes	see comment 89		
109	Need to keep in evolution rather than changing it to biological diversity. Remove that evolution MAY result from natural selection and keep it that is results from.				
114	Evolution section is weak and watered down. It needs to be strengthened.				
145	Go back to Core standards NOT essential. Put the marked out information back in. Leave in Note on page 48- critical to have it.	Yes	see comment 89		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.				
170	Funding				
172	1. Need to make the Earth and Space science essential standards more rigorous, as most high schools in AZ do not include an Earth science class, or if they do, most advanced students don't take it. So, to make certain these students get enough Earth Science to be literate in Earth science, please make the Essential standards more rigorous. 2. Once again: remove the word hazard and replace it with natural geologic processes, because that is what earthquakes, volcanic eruptions, floods, tornadoes, hurricanes, landslides are!	1. no 2. Yes	2. Standard	HS+E.E1U4.13 change hazard to natural geologic and atmospheric processes (including climate change)	Humans consider natural processes hazardous because we put ourselves there.
203	The Key concepts should be dropped from every grade level.	Yes	see comment 65		
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/				
228	It doesn't make sense for certain topics to be taught in all sciences!! Why/how would Biology teach about Kepler's Laws? Why/how would Physics teachers teach about DNA and mitosis? There should be certain topics that are limited to the appropriate subject area. I suppose that some review will need to be done before students take a test over the essentials in 11th grade, but that should be done by the appropriate content teachers.				
264	Biology, physics, chemistry, and earth science in 3 credits?				
265	Pages 47 - 70 Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.				
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.				

279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.				
281	Nothing				
292	Nothing in particular.				
298	I would add the following to be an essential standard instead of a plus. These are very common in Bio classes across all campuses that I have visited and would do the students a disservice if they were not all taught across the state. This list was created with efforts of most of the biology teachers from the Leonagroup.HS+B.L2U1.2 HS+B.L2U3.3HS+B.L4U1.4 HS+B.L1U2.7 HS+B.L2U2.8 HS+B.L1U2.10 HS+B.L1U2.13HS+B.L3U1.16HS+B.L4U1.19				
300	Return evolution standards to how the educators wrote them				
313	Address a realistic timeframe to teach these standards accounting for a loss of 20 days per year for various testing requirements and the typical lack of technology available in the science classroom.				
335	no suggestions				
354	#NAME?				
376	The 3 years of standards do not give enough rigor to students who are pursuing STEM or science fields in college.				
380	The essential standards would result in the unintended consequence of limiting opportunities for all students to have access to rigorous and meaningful science instruction. Many teachers will only teach the essential standard and ignore the others. All standards , even the + standards should be taught to all students. My recommendation would be to incorporate learning progressions along with each standard and incorporate statements for assessment boundaries.				
386	Do not remove the understanding of fossil fuels and how they negatively impact the environment!	no	standards		is already addressed in HS+E.E1U4.14
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
430	Consider the metric system and innumeracy. Neither of these is addressed properly across the standards.				
431	The essential standards have a fairly large amount of detail that will be challenging to fully address in three science courses. There is also the additional problem of implementation. Most schools have separate Biology and Chemistry courses, but the remaining Earth Science and Physical Science material do not marry very well into a single course. Where is the emphasis on climate change in the Essential Standards?	yes	standards	none	climate change is in standards. HS.E1U4.14, HS+E.E1U4.13 and HS+E.E1U4.15 all address climate change.
442	The positive and negative impacts sections should provide some specific examples				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	see comment 65		

569	HS.L1U2.24 Key concepts: consider changing wording to Relate cell structure to cell FUNCTION, organ systems . Purpose implies something intentional. HS.L2U2.28 Key Concepts: change wording to chromosomes which determine SEX at conception rather than gender. Gender is a social construct; sex is the biological anatomy of reproductive structures.Consider revising the evolution standards. All students, not just the HS+, need to be able to 1) Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. 2) Construct an explanation based on evidence that the process of evolution primarily results from the 4 factors. 3) apply concepts of statistics and probability to support explanations that organisms with advantageous heritable traits (adaptations) tend to increase in proportion to organisms lacking this trait. 4) construct an explanation based on evidence for how natural selection leads to the adaptation of populations. 5) Evaluate evidence supporting claims that changes in teh environmental conditions may result in increases in the number of some species, the emergence of new species over time, and the extinction of other species.				
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HS Standards
as they apply
to Physical
Science:

Survey Question	61. What would you like the working group to consider as they revise the High School Essential Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
19	Evolution, the Big Bang, and the billion year old age of the Earth must be accurately represented in this standards! Religion has no place in the classroom.	Yes	Standards	Include all scientific evidence based content, accepted by the scientific community, into standards	This is a building block for future AP and college classes.
24	As stated before, no removal of words which carry conflicting messages for those with religious beliefs. Teach your religion at home.	See comment #19			
31	Do not remove the terms evolution and big bang theory. These are key science terms that are part of the science community and should be taught using the correct terminology. There is no reason to edit these standards to not include these terms.	See comment #19			
40	The Big Bang is a fundamental part of science like the theory of evolution. Keep religion and god out of the science or you will create very confusing students with no place is today work environment.	See comment #19			
43	They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.	See comment #19			
49	The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.	See comment #19			

61	HUGE CONCERN In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018. Evolution is a HUGE part of biology and should not be something to fear....especially when knowledge of mechanisms of biological evolution are helping to create so many life saving medicines and helping us to understand biological life. We really need to get over seeing this word as a threat.	See comment #19			
65	1. We should require four credits of science in high school in order to make sure our students are truly competitive with those from other states. The breadth of the standards here are good, but trying to achieve that in three years inevitably will lead to a shallow understanding of some of them. 2. There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels. 3. Many of the edits introduced during the Douglas internal review damage the rigor of these standards by obscuring or minimizing core concepts in science such as evolution through natural selection, explanations of cosmological evolution through the big bang theory, and man's impact on the environment and climate change. 4. The inclusion of the key concepts lists returns us to the old model of science as a noun, instead of effective research-based model of science as a verb using inquiry and experimentation and emphasizing the processes of science. The key concepts list should be part of a document detailing the state assessment, not this standards document.	Yes	Introduction, key concept	Add expectation of metrics as data collection method to science and engineering practice introductions.	Scientific measurement is addressed in the introduction (p.47).
66	Add in species evolution and the Big Bang	See comment #19			
67	The deletion of evolution and Big Bang theory need to be included in these standards	See comment #19			
69	Include evolution and the Big Bang theory.	See comment #19			
83	No! Bring back all scientific theories!	See comment #19			
86	Make sure that fundamental science concepts that will prepare students for college are taught; including evolution & the big bang theory.	See comment #19			
89	Core, not essential.				
92	Why are they not core standards? If it generates an opportunity for high school credit, keep the name.				
109	Need to keep in evolution rather than changing it to biological diversity. Remove that evolution MAY result from natural selection and keep it that is results from.	See comment #19			
114	Evolution section is weak and watered down. It needs to be strengthened.	See comment #19			
145	Go back to Core standards NOT essential. Put the marked out information back in. Leave in Note on page 48- critical to have it.				
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.				
170	Funding				

172	Need to make the Earth and Space science essential standards more rigorous, as most high schools in AZ do not include an Earth science class, or if they do, most advanced students don't take it. So, to make certain these students get enough Earth Science to be literate in Earth science, please make the Essential standards more rigorous. Once again: remove the word hazard and replace it with natural geologic processes, because that is what earthquakes, volcanic eruptions, floods, tornadoes, hurricanes, landslides are!	Yes	Standards	HS.E1U4.14 Change hazard to "natural geologic processes. See also plus standards HS+.E1U4.13	
203	The Key concepts should be dropped from every grade level.				
208	Simplification.				
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/				
228	It doesn't make sense for certain topics to be taught in all sciences!! Why/how would Biology teach about Kepler's Laws? Why/how would Physics teachers teach about DNA and mitosis? There should be certain topics that are limited to the appropriate subject area. I suppose that some review will need to be done before students take a test over the essentials in 11th grade, but that should be done by the appropriate content teachers.	Yes	Organization	Supporting document that includes potential scope and sequence of courses, similar to NGSS	
264	Biology, physics, chemistry, and earth science in 3 credits?	Yes	Assessment	Assessment will need to be realistic for a 2.75 year time span	Promptly notify districts of assessment boundaries
265	Pages 47 - 70Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.				
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.				
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.				
281	Nothing	No			
292	Nothing in particular.	No			
298	I would add the following to be an essential standard instead of a plus. These are very common in Bio classes across all campuses that I have visited and would do the students a disservice if they were not all taught across the state. This list was created with efforts of most of the biology teachers from the Leonagroup. HS+B.L2U1.2 HS+B.L2U3.3HS+B.L4U1.4 HS+B.L1U2.7 HS+B.L2U2.8 HS+B.L1U2.10 HS+B.L1U2.13HS+B.L3U1.16HS+B.L4U1.19				
300	Return evolution standards to how the educators wrote them	See comment #19			
313	Address a realistic timeframe to teach these standards accounting for a loss of 20 days per year for various testing requirements and the typical lack of technology available in the science classroom.				
335	no suggestions	No			
354	#NAME?	No			
376	The 3 years of standards do not give enough rigor to students who are pursuing STEM or science fields in college.	See comment #264			

380	The essential standards would result in the unintended consequence of limiting opportunities for all students to have access to rigorous and meaningful science instruction. Many teachers will only teach the essential standard and ignore the others. All standards , even the + standards should be taught to all students. My recommendation would be to incorporate learning progressions along with each standard and incorporate statements for assessment boundaries.				
386	Do not remove the understanding of fossil fuels and how they negatively impact the environment!	Yes	Standards and Key Concepts	HS.E1U4.14 Add fossil fuels to key concepts or standard	
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
430	Consider the metric system and innumeracy. Neither of these is addressed properly across the standards.				
431	The essential standards have a fairly large amount of detail that will be challenging to fully address in three science courses. There is also the additional problem of implementation. Most schools have separate Biology and Chemistry courses, but the remaining Earth Science and Physical Science material do not marry very well into a single course. Where is the emphasis on climate change in the Essential Standards?	Yes	Standards and Key Concepts	HS.E1U4.14 Add climate change to key concepts or standard	
442	The positive and negative impacts sections should provide some specific examples				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				
569	HS.L1U2.24 Key concepts: consider changing wording to Relate cell structure to cell FUNCTION, organ systems . Purpose implies something intentional. HS.L2U2.28 Key Concepts: change wording to chromosomes which determine SEX at conception rather than gender. Gender is a social construct; sex is the biological anatomy of reproductive structures.Consider revising the evolution standards. All students, not just the HS+, need to be able to 1) Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. 2) Construct an explanation based on evidence that the process of evolution primarily results from the 4 factors. 3) apply concepts of statistics and probability to support explanations that organisms with advantageous heritable traits (adaptations) tend to increase in proportion to organisms lacking this trait. 4) construct an explanation based on evidence for how natural selection leads to the adaptation of populations. 5) Evaluate evidence supporting claims that changes in teh environmental conditions may result in increases in the number of some species, the emergence of new species over time, and the extinction of other species.				

HS Standards
as they apply
to Life Science:

Survey Question	61. What would you like the working group to consider as they revise the High School Essential Science Standards?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
19	Evolution, the Big Bang, and the billion year old age of the Earth must be accurately represented in this standards! Religion has no place in the classroom.	No	Comment-Negative		
24	As stated before, no removal of words which carry conflicting messages for those with religious beliefs. Teach your religion at home.	No	Comment-Negative		
31	Do not remove the terms evolution and big bang theory. These are key science terms that are part of the science community and should be taught using the correct terminology. There is no reason to edit these standards to not include these terms.	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
40	The Big Bang is a fundamental part of science like the theory of evolution. Keep religion and god out of the science or you will create very confusing students with no place is today work environment.	No	Comment-Negative		
43	They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
49	The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
61	HUGE CONCERN In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018. Evolution is a HUGE part of biology and should not be something to fear....especially when knowledge of mechanisms of biological evolution are helping to create so many life saving medicines and helping us to understand biological life. We really need to get over seeing this word as a threat.	Yes	Standard	Return "mechanism of biological evolution" All LS4 is included	
65	1. We should require four credits of science in high school in order to make sure our students are truly competitive with those from other states. The breadth of the standards here are good, but trying to achieve that in three years inevitably will lead to a shallow understanding of some of them. 2. There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels. 3. Many of the edits introduced during the Douglas internal review damage the rigor of these standards by obscuring or minimizing core concepts in science such as evolution through natural selection, explanations of cosmological evolution through the big bang theory, and man's impact on the environment and climate change. 4. The inclusion of the key concepts lists returns us to the old model of science as a noun, instead of effective research-based model of science as a verb using inquiry and experimentation and emphasizing the processes of science. The key concepts list should be part of a document detailing the state assessment, not this standards document.	Yes	Standard	2. Addressed #430 3. Evolution Addressed #61 4. Suggested #89	

66	Add in species evolution and the Big Bang	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
67	The deletion of evolution and Big Bang theory need to be included in these standards	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
69	Include evolution and the Big Bang theory.	Yes	Standard	Return the term Evolution	Big Bang Earth and Space Science
83	No! Bring back all scientific theories!	No	Comment-Negative		
86	Make sure that fundamental science concepts that will prepare students for college are taught; including evolution & the big bang theory.	Yes	Standard	Make sure to include all LS4	
89	Core, not essential.	Yes	Coding	Combine essential and Plus and add in assessment boundaries	
92	Why are they not core standards? If it generates an opportunity for high school credit, keep the name.	No	Other	See Suggested #89	
109	Need to keep in evolution rather than changing it to biological diversity. Remove that evolution MAY result from natural selection and keep it that is results from.	Yes	Standard	Change May to Primarily	
114	Evolution section is weak and watered down. It needs to be strengthened.	Yes	Standard	See Suggested #86	
145	Go back to Core standards NOT essential. Put the marked out information back in. Leave in Note on page 48- critical to have it.	yes	Introduction	Add in removed comments to explain the core and essential standards	
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Comment-Negative		
162	Adopt NGSS standards	Yes	Standards		
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.	No	Comment - Positive		
170	Funding	No	Other		
172	Need to make the Earth and Space science essential standards more rigorous, as most high schools in AZ do not include an Earth science class, or if they do, most advanced students don't take it. So, to make certain these students get enough Earth Science to be literate in Earth science, please make the Essential standards more rigorous. Once again: remove the word hazard and replace it with natural geologic processes, because that is what earthquakes, volcanic eruptions, floods, tornadoes, hurricanes, landslides are!	Yes	Standards	See Earth and Space Review	See Earth and Space Review
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts		
208	Simplification.	No	Other		
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/	Yes	Standards		

228	It doesn't make sense for certain topics to be taught in all sciences!! Why/how would Biology teach about Kepler's Laws? Why/how would Physics teachers teach about DNA and mitosis? There should be certain topics that are limited to the appropriate subject area. I suppose that some review will need to be done before students take a test over the essentials in 11th grade, but that should be done by the appropriate content teachers.	Yes	Instruction	Clarity of intent of standards	
264	Biology, physics, chemistry, and earth science in 3 credits?	No	Other		
265	Pages 47 - 70Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.	yes	Standard	Remove reference "formerly scientific method" see suggested changes #203 - Learning progressions from framework and workgroup discussion 5/17/18	
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.	No	Other		
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.				
281	Nothing	No			
292	Nothing in particular.	No			
298	I would add the following to be an essential standard instead of a plus. These are very common in Bio classes across all campuses that I have visited and would do the students a disservice if they were not all taught across the state. This list was created with efforts of most of the biology teachers from the Leonagroup.HS+B.L2U1.2 HS+B.L2U3.3HS+B.L4U1.4 HS+B.L1U2.7 HS+B.L2U2.8 HS+B.L1U2.10 HS+B.L1U2.13HS+B.L3U1.16HS+B.L4U1.19				
300	Return evolution standards to how the educators wrote them				
313	Address a realistic timeframe to teach these standards accounting for a loss of 20 days per year for various testing requirements and the typical lack of technology available in the science classroom.				
335	no suggestions	No			
354	#NAME?	No			
376	The 3 years of standards do not give enough rigor to students who are pursuing STEM or science fields in college.				
380	The essential standards would result in the unintended consequence of limiting opportunities for all students to have access to rigorous and meaningful science instruction. Many teachers will only teach the essential standard and ignore the others. All standards , even the + standards should be taught to all students. My recommendation would be to incorporate learning progressions along with each standard and incorporate statements for assessment boundaries.	Yes	Organization	See Suggested #89	

386	Do not remove the understanding of fossil fuels and how they negatively impact the environment!				
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts	For 3 dimensional Learning "However, in order to facilitate students' learning, the dimensions must be woven together in standards, curricula, instruction, and assessments." Page 29 K-12 Framework	Page 29 and 30 of K-12 Framework missing language of crosscutting standards
430	Consider the metric system and innumeracy. Neither of these is addressed properly across the standards.	No	Cirriculum		
431	The essential standards have a fairly large amount of detail that will be challenging to fully address in three science courses. There is also the additional problem of implementation. Most schools have separate Biology and Chemistry courses, but the remaining Earth Science and Physical Science material do not marry very well into a single course. Where is the emphasis on climate change in the Essential Standards?	No	Cirriculum		
442	The positive and negative impacts sections should provide some specific examples	No	Cirriculum		Too could direct instruction
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts	Learning progressions from framework and workgroup discussion 5/17/18	

569	HS.L1U2.24 Key concepts: consider changing wording to Relate cell structure to cell FUNCTION, organ systems . Purpose implies something intentional. HS.L2U2.28 Key Concepts: change wording to chromosomes which determine SEX at conception rather than gender. Gender is a social construct; sex is the biological anatomy of reproductive structures.Consider revising the evolution standards. All students, not just the HS+, need to be able to 1) Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. 2) Construct an explanation based on evidence that the process of evolution primarily results from the 4 factors. 3) apply concepts of statistics and probability to support explanations that organisms with advantageous heritable traits (adaptations) tend to increase in proportion to organisms lacking this trait. 4) construct an explanation based on evidence for how natural selection leads to the adaptation of populations. 5) Evaluate evidence supporting claims that changes in teh environmental conditions may result in increases in the number of some species, the emergence of new species over time, and the extinction of other species.	Yes	Key Concepts	1. Change "Purpose" to "Function" 2. Change "Gender" to "Sex"	
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Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
	HS.B1U1.1 Understand the strengths and weaknesses of philosophies used and the various methods of science studies, assumptions and the peer review process.	N			1. Already addressed in the Science & Engineering Practices. This can be seen on p. 3, in the introduction of the standards (obtain, evaluate, and communicate information). 2. Regarding the addition of "information" in the text, the term information is vague, science is observable and testable.

Survey Question	63. What would you like the working group to consider as they revise the High School Plus (HS+Phy) Standards for Physics courses?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
106	Some topics are now taught in the second year high school course. I would have those topics reflect that they are taught to students taking two years of physics in high school.	No	Standards		These are the essential standards
114	Evolution section is weak and watered down. It needs to be strengthened.	No			Not physics standards related
154	I am pleased to see that the need for a real Physics curriculum is being addressed	No	Positive comment		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Standards		Too vague
162	Adopt NGSS standards	No	standards		Not in our control
170	Funding	No			
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts	Move away from vocab lists. Incorporate learning progression.	
208	Simplification.	No			Too vague
228	The Plus Standards seem pretty good, except that light is not directly mentioned and it is an important topic.	Yes	standards	Committee should review this addition of light	
265	Pages 47 - 70 Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.	Yes	standards, key concepts, introduction	Change the word "formerly" to "build upon", "building beyond", "based on"	
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.	Yes	standards	Revisit depth in next committee	Look at specificity
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	No	negative comment		Already addressed in Science and Engineering Practices
281	Nothing	No			
292	Nothing in particular.	No			
335	no suggestions	No			
376	I find that the plus is good, but have some difficulty getting all the content (with another class like chem) into their HS career as they are closely related. The students would not be able to be involved in multiple, deep content if doing a STEM career.	Yes	Standards	Clarify what is the purpose of the plus standards.	
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.	Yes	Organization, Key concepts	2 documents: a) Essential b) Essential and Plus combined to one	

390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts	Move away from vocab lists. Incorporate learning progression.	See comment 203
430	Good start. Change out breadth of knowledge for greater depth though.	No	Positive comment		Too broad
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts	Change to learning progression	

Survey Question	65. What would you like the working group to consider as they revise the High School Plus (HS+C) Standards for Chemistry courses?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
45	Please follow the National science education standards.	No			Too broad
114	Evolution section is weak and watered down. It needs to be strengthened.	No			Not related to chemistry standards
154	I want to ensure there are hands-on experiments so students can experience that type of learning in our classrooms.	No	Instruction		Science and Engineering Practices are embedded in standard
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	No	Standards		Too vague
162	Adopt NGSS standards	No	Standards		Not in current groups control
170	Funding	No			Not in current groups control
203	The Key concepts should be dropped from every grade level.	Yes	Key Concepts	Move away from vocabulary lists to learning progression, or something similar, per grade band.	
208	Simplification.	No			Too vague
228	I no longer teach Chemistry so I don't feel comfortable evaluating these.	No			
265	Pages 47 - 70 Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.	Yes	Key Concepts, Introduction	Change the word "formerly" to "building upon", "building beyond", etc	Too vague
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.	Yes	Standards	Revisit depth in committee	Specificity also needs to be looked at- Consider depth boundaries
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	No			Already addressed in Science and Engineering Practices
281	Nothing	No			
292	Nothing in particular.	No			
335	no suggestions	No			
354	Hs+C.P1U3.2 discusses nuclear changes that are far beyond even college level understanding. Teaching this without more basic content understanding will be impossible. I suggest removing this standard completely	Yes	Standards		
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.	Yes	Organization, Key Concepts	Format should be a separate document for essential standards vs. entire course standards (including plus)	Renaming "Plus" standards, to clarify that it is not just honors. Not visually having a separate column for essential and plus, but acknowledging assessed state standards.

390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	Yes	Key Concepts		Addressed in 203
430	Good start. Change out breadth of knowledge for greater depth though.	No	Positive comment		Too broad
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	No	Key Concepts		Move away from vocab list

Survey Question	67. What would you like the working group to consider as they revise the High School Plus (HS+E) Standards for Earth/Space Sciences courses?				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
6	P.62 Replace stricken language regarding the Big Bang Theory.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
11	This section needs to include the big bang theory, not creation.	Yes	standard	replace language specific to the Big Bang	same as comment 6
13	I don't know how you could well prepare a student entering college without ever learning about the Big Bang Theory or having the opportunity to analyze the evidence that supports it. Again, that is a disservice to our students.	yes	standard	replace language specific to the Big Bang	same as comment 6
19	Evolution, the Big Bang, and the age of the Earth must be represented accurately. Drop the religious nonsense.	yes	standard	replace language specific to the Big Bang	same as comment 6
26	Cannot simply remove teaching a well-established scientific theory such as the big bang.	yes	standard	replace language specific to the Big Bang	same as comment 6
31	The original draft of the standards are excellent , but the internal review erroneously removes the following section of the standard, supporting evidence for the Big Bangtheory and the scale of the Universe Please do not remove this from the standard.	yes	standard	replace language specific to the Big Bang	same as comment 6
40	Big Bang theory must to be part of the program	yes	standard	replace language specific to the Big Bang	same as comment 6
43	They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.	yes	standard	replace language specific to the Big Bang	same as comment 6
45	Please follow the National science education standards.	no	other		The State Board of Education determined that Arizona would write our own standards
49	The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.	yes	standard	replace language specific to the Big Bang	same as comment 6
56	use specific vocabulary and terms. do not shy away from these terms. they need to be used and understood.HS.E2U2.17 - I am concerned about the lack of using septic terms and theories that are fact-based and show viable arguments for the concept of expansion the universe and the Big Bang theory. This is not philosophy class. We want our students to have a solid foundation of understanding of how the world/universe works. Analysis of why is a different discipline of study.	yes	standard	replace language specific to the Big Bang	same as comment 6
61	Many of the earth science standards are more focused on environmental science, which is great...but it doesn't leave much left to teach in just earth science.	yes	standard	none	Did not find that 4 standards that relate to env sci detract from the Earth Sci standards.
65	For HS.E2U2.17, return specific mention of the big bang theory.	yes	standard	replace language specific to the Big Bang	same as comment 6
67	The deletion of evolution and Big Bang theory need to be included in these standards	yes	standard	replace language specific to the Big Bang	same as comment 6
80	Omitting the Big Bang theory just makes you look stupid. Let scientists write the standards.	yes	standard	replace language specific to the Big Bang	same as comment 6

91	I'm a grandmother as well as a concerned citizen and a geologist who spent over 25 years in the field of marine geological research (Deep Sea Drilling Project and the Ocean Drilling Program). Our main areas of research include climate studies, tectonics, evolution (paleobiology, stratigraphy, geomicrobiology, mass extinctions, etc), geochemistry. I am shocked that the proposed AZ Science Standards include no mention of global warming and a minor and insignificant mention of climate change. This is shameful, especially since the next generation of school children will be the ones left to understand and deal with the effects of global warming/climate change. In addition, as someone who has seen evolution being put to the test in the field by watching paleontologists in action, I find it absurd that most references to evolution are crossed out or diluted in meaning. Arizona cannot expect it's poorly funded teachers and schools to excel, especially when the teachers are not encouraged to teach the fundamentals of science, fundamentals that serve as the bedrock foundation for science in the real world.	yes	standard	Put evolution back in Life Science change to Earth Science	no climate change is in standards. HS.E1U4.14, HS+E.E1U4.13 and HS+E.E1U4.15 all address climate change.
114	Evolution section is weak and watered down. It needs to be strengthened.	Yes	standard	Put evolution back in Life Science	Evolution should be taught in science.
145	Page 62 Return to: Analyze, interpret supporting evidence for the Big Bang theory and the scale of the Universe.	yes	standard	replace language specific to the Big Bang	same as comment 6
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.	no	same as comment 45		
162	Adopt NGSS standards	no	same as comment 45		
165	Talking about the evolution of planetary structures makes no sense whatsoever. This is another politically driven topic based on a great deal of speculation. We simply haven't been able to observe these things for a long enough period of time to come to any conclusions about their evolution. The curriculum needs to be purged of ALL politically motivated content, whether it be by governmental fiat, lobbying, or Establishment science which systematically crowds out dissenting opinions.	no			
172	Too narrow a focus on the causes of climate: it is not just the flow of energy that creates climate changes! Climate models require very sophisticated computing equipment: something not available to high school students, and rarely available to college students, unless they are working with a professor who has funding to research and create a climate model. Rather one might want to focus on creating an explanation of the difference between climate and weather. And possibly discuss how even using very sophisticated weather modeling equipment, that weathermen frequently get the prediction incorrect...so how accurate can climate models be, when they have a much longer time frame involved. Consider moving standard 8 to the list of Earth Science Essential standards. Consider adding to standard 15: creating a quantitative model that illustrates how the Earth Systems affect each other (without any impact from humans).	no			
203	The Key concepts should be dropped from every grade level.	yes	key concepts	none	ADE directed to be included
208	Simplification.	no			
228	The concepts of analysis of light (spectra) and the Hertzsprung-Russell Diagram are important enough to receive proper mention--possibly as their own + Standard.	yes	standard	none	Committee instructed to stay away from performance objectives
236	I would like to see separate domains pertaining to areas of study under Environmental Science. There are several items I would want to see included. Explicit language about human-caused climate change should be included.	no			
265	Pages 47 - 70Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.	yes	introduction	remove phrase "formerly known as the scientific method"	The SEP are not the as the Scientific Method.
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.	no			
281	Nothing	no			
292	Nothing in particular.	no			

335	no suggestions	no			
374	These standards do not consider the lack of math skills found in Earth Science classrooms.	no			This can be addressed with local curriculum.
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.	no	Organization		ADE does not dictate course sequence in HS.
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.	yes	see comment 203		
394	Humans will no doubt explore our solar system, and at present, there is research being done to put humans back on the moon and on to Mars. Do the Earth & Space standards cover students' learning/exploring about traveling to or living on Mars? (shorter question: Do the standards cover students learning about the exploration of traveling to and living on the planet Mars?)	no			
430	Good start. Change out breadth of knowledge for greater depth though. Add something about the timescale of the universe and the age of planet Earth. Don't call things spheres if at all avoidable.	yes	see comment 6		
431	Where is the emphasis on climate change? This is the most serious issue facing this generation of students, yet this is barely addressed as a footnote to the effect of the Sun on the climate, and only in the Plus Standards. People of all countries will need to work together immediately to reduce the global consequences of climate change. It is shameful that this is barely addressed in any way, shape, or form.	yes	see comment 91		
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	yes	see comment 203		

Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
B-1	HS+E.E1U2.3 Assess the confidence level of your predictions in light of the wide range of results from the current set of global climate models.	y	standard	none	Addition introduces bias - the assumption is that current climate data is inaccurate.
B-2	HS.E2U2.17 add to key concepts: Strengths and weaknesses of theories	y	key concepts	none	The terms "strength" and "weakness" are subjective and introduce bias based on feelings rather than facts.

Survey Question	61. What would you like the working group to consider as they revise the High School Essential Science Standards? EARTH/SPACE				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
19	Evolution, the Big Bang, and the billion year old age of the Earth must be accurately represented in this standards! Religion has no place in the classroom.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
24	As stated before, no removal of words which carry conflicting messages for those with religious beliefs. Teach your religion at home.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
31	Do not remove the terms evolution and big bang theory. These are key science terms that are part of the science community and should be taught using the correct terminology. There is no reason to edit these standards to not include these terms.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
40	The Big Bang is a fundamental part of science like the theory of evolution. Keep religion and god out of the science or you will create very confusing students with no place in today work environment.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
43	They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
49	The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
61	HUGE CONCERN In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018. Evolution is a HUGE part of biology and should not be something to fear....especially when knowledge of mechanisms of biological evolution are helping to create so many life saving medicines and helping us to understand biological life. We really need to get over seeing this word as a threat.				

65	1. We should require four credits of science in high school in order to make sure our students are truly competitive with those from other states. The breadth of the standards here are good, but trying to achieve that in three years inevitably will lead to a shallow understanding of some of them. 2. There needs to be clearer emphasis on the use of the metric system in all data collection and analysis in science at all levels. 3. Many of the edits introduced during the Douglas internal review damage the rigor of these standards by obscuring or minimizing core concepts in science such as evolution through natural selection, explanations of cosmological evolution through the big bang theory, and man's impact on the environment and climate change. 4. The inclusion of the key concepts lists returns us to the old model of science as a noun, instead of effective research-based model of science as a verb using inquiry and experimentation and emphasizing the processes of science. The key concepts list should be part of a document detailing the state assessment, not this standards document.	1. No 2. Yes 3. Yes 4. Yes	2. other 3. standards 4. Key Concepts	2. state use of metrics in science in introduction. 3. see comment 19 4. none	4. ADE directed to be included.
66	Add in species evolution and the Big Bang	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
67	The deletion of evolution and Big Bang theory need to be included in these standards	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
69	Include evolution and the Big Bang theory.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
83	No! Bring back all scientific theories!	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
86	Make sure that fundamental science concepts that will prepare students for college are taught; including evolution & the big bang theory.	Yes	standard	replace language specific to the Big Bang	The Big Bang Theory is the only scientific theory for the creation of the universe. Earth and Space Science should address the scientifically based explanation for the creation of the universe.
89	Core, not essential.	Yes	other	replace word "core"	Core indicates central focus of standard

92	Why are they not core standards? If it generates an opportunity for high school credit, keep the name.	Yes	see comment 89		
109	Need to keep in evolution rather than changing it to biological diversity. Remove that evolution MAY result from natural selection and keep it that is results from.				
114	Evolution section is weak and watered down. It needs to be strengthened.				
145	Go back to Core standards NOT essential. Put the marked out information back in. Leave in Note on page 48- critical to have it.	Yes	see comment 89		
157	We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.				
162	Adopt NGSS standards				
168	I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.				
170	Funding				
172	1. Need to make the Earth and Space science essential standards more rigorous, as most high schools in AZ do not include an Earth science class, or if they do, most advanced students don't take it. So, to make certain these students get enough Earth Science to be literate in Earth science, please make the Essential standards more rigorous. 2. Once again: remove the word hazard and replace it with natural geologic processes, because that is what earthquakes, volcanic eruptions, floods, tornadoes, hurricanes, landslides are!	1. no 2. Yes	2. Standard	HS+E.E1U4.13 change hazard to natural geologic and atmospheric processes (including climate change)	Humans consider natural processes hazardous because we put ourselves there.
203	The Key concepts should be dropped from every grade level.	Yes	see comment 65		
208	Simplification.	no			
211	I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. https://www.nextgenscience.org/				
228	It doesn't make sense for certain topics to be taught in all sciences!! Why/how would Biology teach about Kepler's Laws? Why/how would Physics teachers teach about DNA and mitosis? There should be certain topics that are limited to the appropriate subject area. I suppose that some review will need to be done before students take a test over the essentials in 11th grade, but that should be done by the appropriate content teachers.				
264	Biology, physics, chemistry, and earth science in 3 credits?				
265	Pages 47 - 70 Restore to what the teachers asked for. Remove additions by ADE. Remove the references to 'formerly the scientific method', and the Key Concept Columns.				
277	It is appropriate in some areas, but lacking in others. It goes in depth in some areas, but lacks in others.				
279	Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.				
281	Nothing				
292	Nothing in particular.				

298	I would add the following to be an essential standard instead of a plus. These are very common in Bio classes across all campuses that I have visited and would do the students a disservice if they were not all taught across the state. This list was created with efforts of most of the biology teachers from the Leonagroup.HS+B.L2U1.2 HS+B.L2U3.3HS+B.L4U1.4 HS+B.L1U2.7 HS+B.L2U2.8 HS+B.L1U2.10 HS+B.L1U2.13HS+B.L3U1.16HS+B.L4U1.19				
300	Return evolution standards to how the educators wrote them				
313	Address a realistic timeframe to teach these standards accounting for a loss of 20 days per year for various testing requirements and the typical lack of technology available in the science classroom.				
335	no suggestions				
354	#NAME?				
376	The 3 years of standards do not give enough rigor to students who are pursuing STEM or science fields in college.				
380	The essential standards would result in the unintended consequence of limiting opportunities for all students to have access to rigorous and meaningful science instruction. Many teachers will only teach the essential standard and ignore the others. All standards , even the + standards should be taught to all students. My recommendation would be to incorporate learning progressions along with each standard and incorporate statements for assessment boundaries.				
386	Do not remove the understanding of fossil fuels and how they negatively impact the environment!	no	standards		is already addressed in HS+E.E1U4.14
387	I believe the working group should reconsider their format. Look to see how the Math Standards are written and presented: Overall essential standards, with each standard broken down into which math course it should be taught in.				
390	Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.				
430	Consider the metric system and innumeracy. Neither of these is addressed properly across the standards.				
431	The essential standards have a fairly large amount of detail that will be challenging to fully address in three science courses. There is also the additional problem of implementation. Most schools have separate Biology and Chemistry courses, but the remaining Earth Science and Physical Science material do not marry very well into a single course. Where is the emphasis on climate change in the Essential Standards?	yes	standards	none	climate change is in standards. HS.E1U4.14, HS+E.E1U4.13 and HS+E.E1U4.15 all address climate change.
442	The positive and negative impacts sections should provide some specific examples				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	see comment 65		

569	HS.L1U2.24 Key concepts: consider changing wording to Relate cell structure to cell FUNCTION, organ systems . Purpose implies something intentional. HS.L2U2.28 Key Concepts: change wording to chromosomes which determine SEX at conception rather than gender. Gender is a social construct; sex is the biological anatomy of reproductive structures.Consider revising the evolution standards. All students, not just the HS+, need to be able to 1) Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. 2) Construct an explanation based on evidence that the process of evolution primarily results from the 4 factors. 3) apply concepts of statistics and probability to support explanations that organisms with advantageous heritable traits (adaptations) tend to increase in proportion to organisms lacking this trait. 4) construct an explanation based on evidence for how natural selection leads to the adaptation of populations. 5) Evaluate evidence supporting claims that changes in teh environmental conditions may result in increases in the number of some species, the emergence of new species over time, and the extinction of other species.				
427	Change standard for evolution and natural selection so they are not presented as a belief, but as an ideas supported by evidence.	Yes	Standard	See suggested changes #61	
430	Good start. Change out breadth of knowledge for greater depth though. Add more about evolution, and possibly make it first as it is the foundational theory of the field.	Yes	Organization		
431	As written, the essential standard for evolution reads more like an extended exploration of genetic diversity, and less like requiring an understanding of the process of evolution. The Plus Standards are barely better, rephrasing the source material to include the word may , when over 160 years of peer-reviewed research continue to support natural selection as a fundamental cause of change in species over time. It also fails to fully explore additional causes of natural selection, or some of the best available evidence for evolution (DNA). Evolution is a cornerstone idea in biology that is the basis for much of modern medicine and helps us to better understand changes in communities. In the AP Biology course administered by College Board, evolution is listed as the first of four big ideas that define biology. These big ideas were developed in communication with the expectations of college professors across the country of what they expected students to learn about in biology. Why have these standards been revised to sound as though we are uncertain about the idea?	yes	Standard	See comment #61 and change May to Primarily	
437	Please do not water down the evolution standards. By doing so, you decrease scientific literacy. There are 30 plus scientific organizations which have felt strongly enough about this topic to make public statements about it. I will be happy to provide you with references if requested.	Yes	Standards	Include LS. 4	
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.	Yes	Key Concepts	See suggested changes #203	

569	<p>The theory of evolution by natural selection is not tentative. HS+B.L4U1.19 MUST be rewritten. ...the process of evolution MAY result from natural selection must be changed to remove the ambiguity or suggestion that evolution is not driven by natural selection. Nowhere in the standards does it suggest that students evaluate the idea that organisms MAY be made up of cells, or that matter MAY be made of atoms. The THEORY of evolution deserves the same treatment as the cell THEORY, the atomic THEORY, and the kinetic molecular THEORY. It does not SEEK to explain; it does explain and any ambiguous language does not belong in these standards.L4 on page 78 must also be revised are believe to is inappropriate for these standards.No where in this document is Charles Darwin mentioned, though the following scientists are: Bohr, Dalton, Newton.Consider revising the evolution standards. All students, not just the HS+, need to be able to 1) Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. 2) Construct an explanation based on evidence that the process of evolution primarily results from the 4 factors. 3) apply concepts of statistics and probability to support explanations that organisms with advantageous heritable traits (adaptations) tend to increase in proportion to organisms lacking this trait. 4) construct an explanation based on evidence for how natural selection leads to the adaptation of populations. 5) Evaluate evidence supporting claims that changes in teh environmental conditions may result in increases in the number of some species, the emergence of new species over time, and the extinction of other species.</p>	Yes	Standards	Remove the word MAY and add "Primarily" Comments reflect all progressions from the LS4 of K12 Framework	
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Public Comment Non-Survey	Public comment received outside of the survey				
Comment #	Public Comment	Actionable Yes/No	Item Addressed	Suggested Changes	Committee Notes
Need to add a new standard	Need to add in new standard for feedback mechanisms for maintaining homeostasis				
	<p>HS.B1U1.1 Understand the strengths and weaknesses of philosophies used and the various methods of science studies, assumptions and the peer review process.</p>	N			<p>1. Already addressed in the Science & Engineering Practices. This can be seen on p. 3, in the introduction of the standards (obtain, evaluate, and communicate information). 2. Regarding the addition of "information" in the text, the term information is vague, science is observable and testable.</p>