

Arizona Science Standards Revision Working Group

Date and time of meeting:	May 17, 2018 8:30 am – 3:30 pm
Scope of work:	<p>On May 17, 2018 a working group of diverse grade level content experts who were responsible for creating the working draft of the 2018 science standards were reconvened. These committee members reviewed the draft of the 2018 Science Standards and addressed public comment/feedback that had been received as of May 14, 2018 via the public survey, which is still available on the ADE website through May 28, 2018.</p> <p>For this meeting the working group committee reviewed public comment/feedback and</p> <ul style="list-style-type: none"> • 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 was able to complete the above tasks for grade level content (K-12) public feedback. The working group did not have enough time to address comments on topics of organization, depth-rigor, breadth, 2018 vs 2004 science standards, or Introduction/Appendices of the 2018 draft science standards. Working group committee comments began with kindergarten – high school grade levels.
Artifact:	<p>The document (artifact) is the actual working document from the science working group committee. As the working groups discussed the feedback/comment they determined:</p> <ul style="list-style-type: none"> • 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 focus on technical review and continue review of public feedback received from May 15-May 28 as well as any feedback that was not addressed by the May 17 th committee. Changes and edits will be made in the DRAFT document by the working groups for grade levels K-5 based on working group suggestions.



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.l4u2.7	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"	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				

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 love. 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			

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			

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 "p	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			

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, 1.1.1.u1.6, and	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 suggestions	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			

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			

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?				
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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			

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	1,14u4.11	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	1.14u4.11	remove the phrase "or entire species"	
145	1.L4U2.10 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	1.14u2.10	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 14Remove Key Concepts ColumnUnder 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. Renumber to 4.10 (see comment on 4.10 above.)	yes	1.12u2.7; 1.14u4.11, 1.14u	, 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				

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

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 16 Remove Key Concept Column Under 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

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.E2U1.8 The 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 Column Under 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

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.				
275	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.				
281	Nothing				
284	Put back insects (which appears to be in 1st now)				
292	Nothing in particular.				
311	These are not what the committee created				
334	Add the body systems back in				
335	no suggestions				
347	Second grade could absolve some of the first grade standards such as 1.L2U1.8 because it lends itself to the already existing second grade 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.				
435	N/a				
472	Move the genetics and evolution standards to 3-4th grade. It is too abstract for earlier grades.				
512	Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.				

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 understandable. 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

Survey Question	32. What would you like the working group to consider as they revise the 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

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 22 Remove 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

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. Renumber 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

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 whetherprovide 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 pinpointed 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
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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				
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.				
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 pin 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 ColumnUnder 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

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 pin 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

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

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.				

Survey Question	42. What would you like the working group to consider as they revise the Physical Science Standards in the Fifth Grade Science Standards?				
Comment #	Public Comment	Item Addressed	Actionable Yes/No	Potential Changes	Refinement Note
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 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.P1U1.1take out atom- this is 5th grade and particle is perfect. take out closed system- not necessar.				
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.				

Survey Question	43. What would you like the working group to consider as they revise the Earth and Space Science Standards 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). On Earth, 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.E2U2.8 Why 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 Columns Under 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.				

Survey Question	44. What would you like the working group to consider as they revise the 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 do 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	<p>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.</p> <p>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?</p>				
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.				

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 34In 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	6L1U2.13 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 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 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 forces use 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 heat 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 than 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 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 #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, 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 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 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		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 42 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		
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 than 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 7?)	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 43 Remove 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 enviroments	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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*Note: Gaps in comment number due to [No Answer Entered]

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				

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.				

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
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 3. 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 standar

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
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.				

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
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		

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
569	<p>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.</p>				

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 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 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.1U4.14
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				
	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.