All Public Comments Received by the California Department of Education
Pertaining to the July 2014 Draft of the
Next Generation Science Standards Systems Implementation Plan for California
(Date Prepared: June 25, 2014)
California Department of Education

Comments received at ngss@cde.ca.gov from July 25 to August 25, 2014.

The comments appear unedited and in the order received.

Comment #1

From: Kirk Brown [kbrown@sjcoe.net]
Sent: Saturday, July 26, 2014 4:07 PM
To: Karen Shores
Subject: RE: Next Generation Science Standards Systems Implementation Plan for California

Hi Karen,
Great work. I hope all is going well.

Kirk

Comment #2

-----Original Message-----
From: Mac [mailto:jscatterall@gmail.com]
Sent: Thursday, July 31, 2014 11:49 AM
To: NGSS
Cc: james@croc-lab.org
Subject: NGSS Systems Implementation Plan

Hello, Would you please clarify a couple of issues surrounding the July 18, 2014 announcement
by Superintendent Torlakson asking for public comments, and perhaps transmit this email as a public comment.

1. Will school-level results on the planned school-level science assessments tied to the NGSS be included in the API of individual schools when fully implemented?

2. For that matter, do you think API will be a feature of California's Assessment and Accountability system for the foreseeable future? (I realize actions of the legislature could change things quickly on this
matter).

3. Does the proposed NCSS system have formal ties to the Common Core implementation activities under way or anticipated by CDE or the SBoE?
4. Will the NCSS system assessments be considered a formal part of California's Common Core Assessments?

5. Since Common Core systems across the 50 states seem to flow from one of two large national consortia, does anything in the planned NGSS derive from what California's consortia model calls for? In other words, perhaps, will a common science test be suggested or effectively imposed based on consortium-generated Common Core systems? And if so, how does this align with the Torlakson-announced CA initiative?

Thanks much,

James S. Catterall
Professor Emeritus, UCLA
Director
Centers for Research on Creativity

Comment #3

From: Boykin, Michael [mailto:mboykin@muhsd.org]
Sent: Saturday, August 02, 2014 7:06 AM
To: NGSS
Subject: Comment on NGSS implementation

The Merced Union High School District has been proactive in preparing our teachers for the coming NGSS. In the summer of 2013, I led 11 days of workshops for science teachers who wanted to be early adopters. We held more workshops this past summer as well. We focused on research-based pedagogical strategies required to implement the NGSS: inquiry, modeling, cooperative learning and reading and writing strategies to deepen literacy. Further, teachers were asked to map out their current sequence of curriculum and examine and analyze the NGSS core ideas for comparison. The goal was to determine what past content could be shed in order to give more time to focus on the practices of science and implement the pedagogical strategies being studied.

A major issue that emerged from these workshops that must be addressed state wide in order to meet the requirements of the NGSS is the equal balance between the disciplines of Life Science, Physical Science, and Earth and Space Science. Currently, all high schools in the state will have little difficulty transitioning to new expectations in Life and Physical. However, we do not have 1/3 of science teachers trained in Earth and Space Science. It may be useful to perform a statewide survey of all current science teachers to understand the extent of this deficit.

We cannot wave a magic wand and suddenly have teachers qualified to teach Earth and Space Science to the depth and rigor expected in the NGSS. The call must go out to both the UC and CSU systems to encourage students to focus on this area with the purpose of becoming qualified high school teachers.

As a member of the American Association of Physics Teachers as well as the CSTA, I have been following and participating in the development of the NGSS since 2012. My school district recognized my understanding of the NGSS and asked me to train my colleagues. I would like to participate in the planning for implementation should there be any further opportunities.

Michael Boykin
Golden Valley High School
Merced

Comment #4

From: Karen Hayes [mailto:khayes@tvusd.k12.ca.us]
Sent: Tuesday, August 05, 2014 10:11 AM
To: Maxine Wheeler
Subject: Fwd: Next Generation Science Standards Systems Implementation Plan for California.

You had requested feedback so I sent this to my science teachers at the middle school. Hope the feedback below helps you in your decision-making.
Karen Hayes, Principal

---------- Forwarded message ----------
From: **Jennifer Glaser** <jglaser@tvusd.k12.ca.us>
Date: Mon, Aug 4, 2014 at 4:26 PM
Subject: Re: Next Generation Science Standards Systems Implementation Plan for California.
To: Karen Hayes <khayes@tvusd.k12.ca.us>

Hi Karen,

Both Brian and I talked and we do not like the new state standards as much as the way it was because:

1. The new state standards remove important information (i.e. chemical reactions) entirely from 8th grade which is has been a huge part of 8th grade science curriculum. If we are preparing students for high school, the students have no exposure to chemical reactions, equations, and labs using this information before they hit high

school. This will make the high school teacher's job much harder as the students will not have had any experience with this information.

2. They put evolution in 8th grade which should belong in 7th grade life science. It makes more sense for it to be there as well as teaching about the cell and other "life" related information.

3. High School is compartmentalized. Biology, Chemistry, Physics etc.. It makes more sense for middle school to be comparmentalized as well if we are preparing students for success in high school.

4. Jumbling the curriculum all around and integrating the curriculum without having continuity throughout the year does not make good logical sense. Geological sciences, Biological sciences, and Physical sciences all have common themes and activities. Not to mention teachers have background knowledge in certain areas. They will be stronger and better teachers for the students when they teach what they have the most knowledge in. Teaching random topics and trying to extrapolate a common theme from each of them is truly unnecessary because we already have the common themes and topics in the compartmentalized subject areas.

5. It does not bare the slightest resemblance to anything in real life. Even in the theme of common core to decompose and resynthesize is already built in to the already existing topics of Chemistry, Physics, Biology, and Geology.

6. The science test scores overall in our area at this particular level are higher percentage-wise than that of students passing math or language arts. The wheel was not broken so why does it need to be rebroken then glued back like a jumbled Picasso painting.

Thank you Karen for forwarding this information!
Jennifer Glaser and Brian Chang

On Thu, Jul 31, 2014 at 3:08 PM, Karen Hayes <khayes@tvusd.k12.ca.us> wrote:
If you would like to look this over and have any input, I would be happy to respond to Mr. Torlakson (State Superintendent) on your behalf. Please send me your feedback by Tuesday, August 5 @ 2:00. Thanks.

Comment #5

From: Susan W. Morrison [mailto:sigmetsue@aol.com]
Sent: Wednesday, August 06, 2014 9:31 AM
To: NGSS
Subject: 5ESS1

Because many administrators, especially of high ELL, high poverty student populations severely limit what may be taught in their schools' classrooms, please clarify the limits of 5ESS1.

At present, the content limits appear to be stars' brightness determined by distance plus the Sun (nearest star), Earth, and Moon system. Should any other planets, especially those that appear to be stars in the night sky, be included in the curriculum?

(It would be nice if in 2020, when the next rover goes to Mars, that administrators are not telling their teachers, "No! You may not say anything about Mars. It's not on the standards!")

Also, as regards to Common Core writing standards for 5th grade, I have scrutinized the CA Standards, the Framework, and Smarter Balanced tests. But I still don't know how in-text references are handled in grade 5. I ask this because my NASA presentations this year are based on NGSS with follow up Common Core Explanatory/Informative writing activities.

Thank you,

Susan Weikel Morrison
Science Educator and Program Developer, Sci-Q Systems
5662 West Home Ave. Fresno, CA 93722
H: 559-276-9022, Mobile: 559-304-8871
Web profile: http://susanweikelmorrison.brandyourself.com/
GEMS Trainer, Lawrence Hall of Science, www.lhsgems.org
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Comment #6

From: Craig Strang [mailto:cstrang@berkeley.edu]
Sent: Wednesday, August 06, 2014 3:07 PM
To: NGSS
Subject: Comment on the Draft Science Implementation Plan

Thank you for the opportunity to comment on the draft Science Implementation Plan for California. The plan is excellent, thoughtful, detailed and extraordinarily ambitious!

I have the following comments and suggestions, offered in the spirit of trying to make an excellent document a bit better.

1. Systems Integration: The plan presents the implementation of CA NGSS as if the implementation of science stands alone and is self-contained.
I think the plan needs to explicitly, directly and urgently address the integral and convergent relationship between NGSS and Common Core ELA, Common Core Math,

California Environmental Literacy Principles and California ELD Standards. The plan should call out the need to coordinate the synergistic and simultaneous implementation of all these content areas. If this is not made explicit, I fear that a) the true spirit of CCSS and NGSS (helping learners to develop thinking and meaning making skills across domains) will never be reached; and most importantly, b) the implementation of science will be once again relegated to the far too small box of time, attention and resources left over after language arts and math are fully addressed. There is one mention of the need to coordinate across disciplines in the Professional Learning Element, but this needs to be much more prominent and more robust, and more fully developed throughout the plan. Systems integration across disciplines could be addressed through Coalition Building and Messaging, but again, I think some careful thought needs to go into addressing this throughout the plan.

2. In the Professional Learning Element, there is language in the Introduction section that implies that the Administrator Professional Learning will be focused on Site Administrators (principals?). I just want to clarify that Planning for the implementation of CA NGSS must include district administrators/leaders from the Superintendent on down, including those involved in district governance as well as those involved in Curriculum and Instruction. While we don't really think of providing PL "workshops" for superintendents and associate superintendents, they must be provided with consulting support and technical assistance that allows them to see science as an integral and essential component of the success of their school system.

3. In the Instructional Resources Element, there are several references to an impending statewide curriculum adoption. Is this the case? Trish Williams has indicated that California will not go through an adoption process, but rather will "endorse" materials. If this is the case, I think the distinction is important. Districts/LEAs do not have to wait the several years until the state endorses materials. If they have the capacity, they can begin now to review and acquire materials.

4. In the Resources section, I would like to see the following added:

State Department of Ed Resources
CA Environmental Literacy Principles and Concepts Report/Recommendations of the California Environmental Literacy Task Force (completed in December 2014)

National Resources
Ocean Literacy: The Essential Principles and Fundamental Concepts of Ocean Sciences for Learners of All Ages www.oceanliteracy.net The Ocean Literacy Scope and Sequence for Grades K-12 www.oceanliteracy.net Climate Literacy: The Essential Principles of Climate Science
cpo.noaa.gov/OutreachandEducation/ClimateLiteracy.aspx

Organizations, Initiatives and Web Based Resources
BaySci: A Partnership for Bay Area Science Education (Lawrence Hall of Science, Exploratorium, Inverness Research) www.baysci.org

I am submitting these comments above as an individual, and would be happy to discuss them further if that would be helpful. In addition, Elizabeth Babcock (California Academy of Sciences) and I may be submitting comments on behalf of the California Environmental Literacy Task Force which we co-chair.

Sincerely,

Craig

--
Craig Strang
Associate Director
Lawrence Hall of Science
University of California
Berkeley, CA 94720-5200
www.lawrencehallofscience.org
www.oceanliteracy.org
beetlesproject.org

Comment #7

From: Wheeler, Marc [mailto:mwheeler@portervilleschools.org]
Sent: Thursday, August 07, 2014 12:01 PM
To: NGSS
Subject: High School Physical Science and Earth Space Science

Hello,

My name is Marc Wheeler. I am a HS physics and Earth science teacher with about 7 years experience. My B.S. degree is in mechanical engineering from Purdue University (W. Lafayette campus, 1991), my credential is from Chico State, (2006). I worked as a mechanical engineer for 12 years, mainly in the chemical industry.

I have been closely following the developments with the NGSS, and I wholeheartedly support the main ideas behind the changes being made. I have been active in providing feedback, and I have found that the more I understand the new standards, the more I like them. However, I do have some concerns with the NGSS that go beyond just format and clarity. Mainly about the amount of content that has been removed from the physical science standards (old physics standards).
The biggest area of weakness that I see is that the whole area of kinetic theory, heat, heat transfer, phase changes, and thermodynamics is missing in terms of having a section that deals with these ideas at the high school level. While I am sure, some of the ideas are included in the lower levels, I know from experience that teachers at the

lower levels, very often do not cover these topics in enough detail, if they cover them at all.

Here is what I see as missing, in my own words.

No standards that really address;

Heat as a form of energy.

Difference between heat, temperature and internal energy.

Dissipative processes, like friction, can transfer 100% of energy into heat, while the opposite is a practical impossibility.

Specific heats of materials, and what it means for heating/cooling rates.

Heat transfer modes – Conduction, Convection and Radiation (absorption and transmission of radiation).

Density changes due to thermal expansion, and relative rates of expansion for gases vs. solids.

Latent heat, and heat transfer during phase changes.

I feel that without having a good basis of the above makes it difficult for students trying to understand how these basic ideas come together in the more complex ideas in Earth science like;

Mantle convection in plate tectonics.

The conversion of potential energy into heat during Earth's formation caused Earth to have a molten interior.

The roles of conduction, and radiative cooling in allowing Earth’s interior to stay molten

Natural Convection in weather/climate/oceans

Earth’s Energy budget – fate of incident solar radiation - How Earth’s atmosphere is heated, and why this leads to convection in the atmosphere.

Stellar structure, and relationships between surface temperature and color.

These are just the ones I could think up in the time to write this.

In addition, some of these topics are very easy to demonstrate and do lab activities with at the high school level, both in Earth Science and Physics, I really wish that more teachers would complain about some of these changes.

I feel that as we start moving into implementation, and more teachers start really using the new standards, you will see the weakness in some of their aspects, and I hope we can correct them sooner rather than later. I would recommend in this case, you go back and look at the issue, and determine if removing these important topics are really the best things for our kids, or just the easier path for our schools to implement.

Why can California not go beyond what the current plan proposes?

Please feel free to reply. Again, I applaud the efforts and the spirit of the changes, I just think too many important ideas were cut in physical science.

Sincerely

Marc Wheeler

mwheeler@portervilleschools.org

Comment #8

From: Retter St.John [mailto:Retter-StJohn@scusd.edu]
Sent: Monday, August 11, 2014 12:55 PM
To: NGSS
Subject: CA NGSS Implementation Timeline

To Whom It may Concern:

I would like to submit a comment and a question based on my review online of the NGSS 1st draft. The implementation timeline does not appear to be well defined in terms of the implementation phases: awareness, transition and actual implementation. Is it possible to clarify the beginning and end of each phase by year?

Thank you for any answer or information that you may be able to provide.

Retter St. John
Science Teacher
JFK HS
Sacramento, CA 95831
Retter-stjohn@scusd.edu

Comment #9

From: Sujatha Raghu [mailto:sraghu@campbellusd.org]
Sent: Thursday, August 14, 2014 10:51 AM
To: NGSS
Subject: Implementation of NGSS in California

TO WHOM IT MAY CONCERN

Dear Sir/Madam

My name is Sujatha Raghu and I have been an 8th grade science teacher for the past 20 years at Rolling Hills Middle School in Campbell Union School District in the county of Santa Clara. Please take into considerations the musings of an active veteran teacher who is passionate about teaching science. Here are my suggestions for the implementation of NGSS in California:

1. Start the implementation first with elementary grades 1 and 2 in the year 2015-16.

2. Add grade the following year and continue in that vein.

All problematic situations as well as the outstanding benefits of these standards will become apparent. Students will come better prepared and I or 2 grades can gradually be added every year. Building skills in creative thinking, inquiry, modeling appropriate assessments will all be cohesive and organized.

Please start bottom up and implement gradually. The problem with all grades simultaneously adopting the standards are going to lead to learning gaps for students. Teachers will have time to adapt, get professional development and be well prepared to get students learning and doing the assessments in a meaningful manner.

Please give these suggestions serious consideration.

Regards,
Sujatha Raghu

Comment #10

From: Alice Robertson [mailto:ARobertson@campbellusd.org]
Sent: Thursday, August 14, 2014 10:51 AM
To: NGSS
Subject: NGSS Comments

Dear Sir or Madam,

I recommend a gradual implementation of the NGSS, starting with younger grades and working their way up as students build meaningful foundations. For example, start with implementation in grades K-2. The following year, add grade 3. After that, add grade 4. This way, students will not develop holes in their scientific skills and understanding as a result of the transition.

As an expedited compromise, add grades 3 and 4 the same year.

While significant gaps in student knowledge may not be as apparent in the younger years, they become huge barriers to student development and confidence in the later years of schooling. A full implementation applied to middle and high school science classes, especially using the integrated model rather than the subject based model, leaves significant gaps in student exposure to knowledge, skills, and learning experiences.
Since the integrated model is a spiral model, it must be implemented gradually - year by year as students age. The only alternative is to ask students to add to foundations that they haven't built yet.

As a middle school teacher with English Language Learners, I personally support the subject based approach more than the integrated approach. Even so, the implementation must be gradual. Since the NGSS is not a list of facts to memorize but rather a more comprehensive approach to thinking critically in scientific fields, students will need to build those skills as they progress through school.

Thank you for your consideration.

Best regards,

Alice Robertson

Comment #11

From: Maria Chiara Simani [mailto:maria.simani@ucr.edu]
Sent: Monday, August 18, 2014 5:04 PM
To: NGSS
Cc: Maria Chiara Simani
Subject: Feedback on the NGSS Implementation Plan for California

Dear NGSS Superheros at CDE,

Thank you for polishing up and putting together this document so well.
Now that it is all together, the implementation task seems perhaps more clear, even if not less challenging.

The "only" BIG comment I have regarding this document is the possibility to make it an online interactive document. Maybe with searchable features.

For example, in order to see the role of the three main stakeholder groups, you need to flip through pages and correlate the elements in the various tables.
Using online techniques, it may be possible to select an element within a strategy and see how the mutual support of each stakeholder may be integrated to achieve that element.

Beyond integrations within the same strategy, it may be useful to highlight connections among elements in different strategies. This approach would really allow to see the plan as a system of implementation, and not as a set of activities that need to happen.

Finally, as the plan is being implemented, links regarding the status of each element within the timeline and developed resources may be added.

As a recommendation, this online tool for NGSS implementation should be sponsored by Achieve as pilot program for nationwide implementation of NGSS. They have expertise in developing online searchable databases and have already some of the resources indicated in strategies 6, 7, and 8 as part of their implementation guidebook.

Thank you for your dedication to the future of our California students.

Regards,
Maria Simani

Maria Chiara Simani, Ph.D.
Executive Director, California Science Project

Department of Physics and Astronomy
University of California Riverside
900 University Avenue
Riverside, CA 92521

maria.simani@ucr.edu
phone - (951) 827-3111
fax - (951) 827-4529
http://cspso.org

Comment #12

From: Lane Melcic [mailto:lane.melcic@gmail.com]
Sent: Monday, August 18, 2014 10:42 PM

To: NGSS
Subject: NGSS

To Whom It May Concern,

It seems to me that the proper implementation of these new standards will necessitate the state to change high school graduation requirements to three (3) years of science, from the current two (2). I think this would be a good thing for the state to do. Especially, considering the talk that has been going on that we need more scientists! Perhaps, the California Department of Education should alert legislators to make this change sooner, rather than later.

Sincerely,
Lane Melcic

Comment #13

From: Ray.Climate [mailto:ray.climate@charter.net]
Sent: Tuesday, August 19, 2014 9:17 AM
To: croe@cslnet.org; NGSS; sgoldstein@cslnet.org
Cc: Walt Reil; Kliewer Steve
Subject: NGSS implementation

To Whom It May Concern:
I am not a professional K-12 educator, but a retired research scientist who strongly supports NGSS. I fully endorse the six bulleted points CSLNET requests.

I would only note the following: Learn what worked and did not work in the various rollouts of the common core standards. Do not rush implementation of NGSS but make sure it is done right and that teachers feel fully prepared to teach to these standards, and that they have the infrastructure needed. The last thing we need is to begin implementation and have it poorly done.

Feel free to forward this to anyone concerned.

Sincerely,

Dr. Ray Weymann
Atascadero California
cc: Steve Kliewer, Walt Reil: Central Coast Stem Collaborative

Comment #14

From: bob aaaa [mailto:bob.aaaa@hotmail.com]
Sent: Wednesday, August 20, 2014 2:37 PM
To: NGSS
Subject: Science Standards article

I was reading an article on the public feedback on science standards in schools in the Press Telegram. Then I visited your website at cde.ca.gov. Much of the webpage appears to be written by school board members, but it seems to be missing the nuts and bolts of STEM - the real hands-on parts of technology etc.
Having been a senior engineer who interviewed many candidates for technical jobs, there are many aspects missing in the American workforce. K-12 and college do not prepare kids for several industries that I have worked in such as medical technology, mainframes, and computer related fields. What is missing in these graduates with "degrees" is the hands-on building blocks of technology. Basically, taking away classes like wood shop or metal shop in schools, kids don't experience the concepts like mechanical properties, so the optimization of a design is missing in their mechanical aptitude. In the electronic world, they haven't done enough in schools in physical experimentation with parts such as micro-controllers which drive motors, read optical data, or do internal controller software functions. Experience with components is missing. Unfortunately for the businesses that I have been in, we teach the new hire employees the basics so that a quality product can continue to be made. Please consider using mentors in schools with real hands-on experience, besides just teaching the "theoretical" lessons.

Bob

Comment #16

From: Jenna Johnson [mailto:jgouthro79@hotmail.com]
Sent: Wednesday, August 20, 2014 9:04 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to California adopting inferior standards. The Fordham Institute gave NGSS a "C" rating. California's current science standards were one of only 6 states in the nation to receive an "A" rating by
Fordham. http://www.edexcellencemedia.net/publications/2012/2012-State-of-State-Science-Standards/2012-State-Science-Standards-California.pdf

Respectfully,
Jenna Johnson

San Marcos, CA
San Marcos Unified School District
San Diego County

Comment #17

From: Rachel Noe [mailto:purplessenceon@hotmail.com]
Sent: Wednesday, August 20, 2014 11:20 PM
To: NGSS
Subject: ngss

In response to the call for public review and comment on NGSS, I would like to say that I am opposed to the standards. The implementation plan described here sound pretty extensive, therefore, EXPENSIVE, and absolutely unnecessary. California had excellent standards prior to CCSSI, and the Science standards specifically hold no comparison. I have seen no explanation as to why we would choose to devote such effort to dumbing down our state standards. As a parent of 2 gradeschool children and a voting citizen of California, I plead with you! Do not go through with this! For my children's sake.
Rachel Ward

Comment #18

From: Amy Norton [mailto:thenortonkids@sbcglobal.net]
Sent: Thursday, August 21, 2014 12:40 AM
To: NGSS
Subject: Horrible Dumbing Down of Standards

Hello,
How on earth can you take science standards that have been given an A by the Fordham Institute and turn them into standards that they have given a C? I am disgusted. I cannot believe that you are doing this to the students in California. It defies logic and reason. Please know that I am 100% against the adoption of the Next Generation Science Standards that have been foisted upon my state. I am saddened that those who came up with these awful standards actually call them standards. They are not standards, they are steps backward. I am also shocked that those who we entrust to watch out for our children have sold them out all for political gain, money, and/or notoriety. Shame on you, California Department of Education. I will do everything in my power to make sure you never misuse the trust we gave you again and will seek to get all of you out of the offices in which you now sit.
Amy Norton
Palmdale, CA
Founder, AV Citizens Against Common Core

Comment #19

From: Tressy Capps [mailto:tlc36c@hotmail.com]
Sent: Thursday, August 21, 2014 7:48 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.
Importance: High

Hello. I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.
Sincerely,

Tressy Capps (951)333-2000
Fontana City Council Candidate

Comment #20

From: isaIah08 [mailto:Pruano88@yahoo.com]
Sent: Thursday, August 21, 2014 8:06 AM
To: NGSS
Subject: Feedback for next Generation science standards

I am opposed to the emphasis of inquiry skills over knowledge. I am also concerned about the lack of foundational learning blocks in early grades

Paul A. Ruano II

Comment #21

Sent: Thursday, August 21, 2014 8:13 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

Susan Colby

Comment #22

From: Jennifer Marin [mailto:jaylee35@hotmail.com]
Sent: Thursday, August 21, 2014 8:26 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards! The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. Http://tinyurl.com/7cfas22

Jennifer Marin

Comment #23

From: Sandra Torosian [mailto:torosiants@comcast.net]
Sent: Thursday, August 21, 2014 8:33 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

♦ I am opposed to adopting inferior standards. The Fordham Institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.
http://tinyurl.com/7cfas22

Please reject Common Core.

Sandy Torosian

Comment #24

From: Stephanie Gabat [mailto:stephgabat@yahoo.com]
Sent: Thursday, August 21, 2014 8:48 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

Concerned Citizen,
Stephanie Gabat

Comment #25

From: calvin lau [mailto:laucalvin@sbcglobal.net]
Sent: Thursday, August 21, 2014 9:14 AM
To: NGSS
Subject: Feedback on Next Generation Science Standards

Dear California Department of Education,

These new standards should not be implemented into our public schools. Not only are they inferior to our existing science standards, I am concerned these standards are religiously non-neutral, which would lead to indoctrination, not education.

Kathy Lau
Parent
Comment #26

From: Nancy Kim [mailto:nensheekim@gmail.com]
Sent: Thursday, August 21, 2014 9:28 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

To Whom It May Concern,

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.http://tinyurl.com/7cfas22

Sincerely,

Nancy Kim

Comment #27

From: Harris, Jennifer [mailto:JHarris@go2uti.com]
Sent: Thursday, August 21, 2014 9:44 AM
To: NGSS
Subject: Science Standards

To whom it may concern,

I am opposed to adopting inferior standards. The Fordham Institute gave NGSS a C rating. California's current science standards were only one of 2 in the nation to receive an A rating from Fordham.

Jenny Harris – Affiliate Owner – Branch 112
Authorized Agent of UTi | Menifee | California | 92584 | USA
jharris@go2uti.com | O +1 800-963-2112 | F +1 951-977-4091 | C +1 951-956-9837

Comment #28

From: Heather Goodwin [mailto:hgoodwin24@yahoo.com]
Sent: Thursday, August 21, 2014 9:47 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Fordham Institute gave NGSS a "c" rating. California's current Science standard were one of ONLY two in the nation to receive an "A" rating from Fordham.
http://tinyurl.com/7cfas22
Thank you,
Heather Goodwin
HTG

Comment #29

From: Elena Danaila [mailto:edanaila@yahoo.com]
Sent: Thursday, August 21, 2014 9:50 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.http://tinyurl.com/7cfas22

Sincerely, and very much opposed to these Science standards,
Elena Scull

Comment #30

From: Sandra Smith [mailto:thatgirlsandra@gmail.com]
Sent: Thursday, August 21, 2014 10:07 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

Members of the CA Dept of Education,

As a registered Democrat and founder of Democrats Against Common Core, I want to express my surprise and displeasure at the CDE adopting clearly inferior science standards. We were one of two states that were given an A rating (10/10) on our science standards by the Fordham Institute, which gives NGSS a C rating. (Source: http://tinyurl.com/7cfas22) However, we are going to take on the great expense of implementing standards that are INFERIOR to our current standards. This does not

make sense and is a huge disservice to our children. It also costs our schools enormous amounts of money that could be better spent on reducing class sizes and bringing back extracurricular activities (which are critical to brain development).

I understand this has been approved, but **it's not too late to reverse our adoption of NGSS. It will be harder after all of the districts have spent millions on new text books.**

I graduated high school in 3 years yet took 5 science courses: Biology, Chemistry, Physics, Anatomy and Physiology, and Zoology. I loved science! I thought the content was excellent and it prepared me well for taking those classes in college. In fact, I aced college Chemistry. I want my children (17, 11, 7 and 7) to have the same opportunities and exemplary science education that I had. I am opposed to the emphasis of inquiry skills over knowledge. I am also concerned about the lack of foundational learning blocks in early grades.

Please, please consider reversing adoption of NGSS before it's too late. More parents are becoming aware of this terrible mistake the CDE has made and will also be objecting.

Thank you for taking the time to read my concerns.
Sandra Smith
(916) 474-0355
3162 Boulder Creek Way
Antelope, CA 95843

Comment #31

From: Shirley Liu [mailto:shirley@tomatobank.com]
Sent: Thursday, August 21, 2014 10:13 AM
To: NGSS
Subject: Feedback for next generation science standards

I am opposed to the emphasis of inquiry skills over knowledge. I am also concerned about the lack of foundational learning blocks in early grades.

Shirley Liu
Assistant Operation Officer

TomatoBank, N.A.
2105 Sawtelle Blvd.,
Los Angeles, CA 90025

Tel: 310.806.9668
Fax: 310.806.9667
shirley@tomatobank.com

Comment #32

From: Shirl [mailto:hsingbabe@gmail.com]
Sent: Thursday, August 21, 2014 10:15 AM
To: NGSS
Subject: Feedback for next generation science standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

Shirley Liu

Comment #33

From: Nannette Furrer [mailto:nfurrer@comcast.net]
Sent: Thursday, August 21, 2014 10:37 AM
To: NGSS
Subject: Ca Science Standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California’s current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22. STOP dumbing down our children!

Nannette Furrer
Castro Valley, CA 94546

Comment #34

From: Cora Brush [mailto:corabrush61@gmail.com]
Sent: Thursday, August 21, 2014 10:45 AM

To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am aware of the connection between NGSS & CCSS. I am not fooled by NGSS' repeated claim of being "state-led", and I am opposed to the involvement of Achieve, Inc. and WestEd.

A Concerned Parent of 2 school aged kids.

Cora Brush

Comment #35

From: Tami4kids@aol.com [mailto:Tami4kids@aol.com]
Sent: Thursday, August 21, 2014 10:47 AM
To: NGSS
Subject: Public Comment NGSS

- I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science Standardshttp://tinyurl.com/7cfas22

- I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

- I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

- I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

- I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

Tami L. Schnurr
1197 N Mollison Ave, Unit F
EL Cajon, CA 92021-4788
Tami4kids@aol.com

Comment #36

From: Dorothy Thomas [mailto:djt0307@roadrunner.com]
Sent: Thursday, August 21, 2014 10:49 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.
Importance: High

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.

Dorothy J Thomas

Comment #37

From: Brenda DeAngelis [mailto:brenda_deangelis@yahoo.com]
Sent: Thursday, August 21, 2014 11:02 AM
To: NGSS
Subject: Public comment NGSS

To whom it may concern:

I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades!!!
Thank you,
Brenda DeAngelis

Comment #38

From: Victoria Haddock [mailto:haddock13@hotmail.com]
Sent: Thursday, August 21, 2014 11:06 AM
To: NGSS
Subject: Public Comment NGSS

To whom it may concern,

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham.
The State of The State Science Standards http://tinyurl.com/7cfas22

I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

Thank you for your time,

Victoria Haddock

Comment #39

From: TT Griffin [mailto:g06j07@hotmail.com]
Sent: Thursday, August 21, 2014 11:18 AM
To: NGSS
Subject: NGSS Feedback

I am well aware of the connection between NGSS and the Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led" and I am opposed to the involvement of Achieve Inc. and WestEd.

TTG

Comment #40

From: amber@lajolladp.com [mailto:amber@lajolladp.com]
Sent: Thursday, August 21, 2014 11:26 AM
To: NGSS
Subject: Public Comment NGSS

To Whom it May Concern:

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to recieve an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham.

I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

I am concerned the standards fall to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

I am concerned the standards are religiously non-neutral, which would lead to indoctrination. not education.

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led." I am opposed at the involvement of Achieve Inc. and Wested.

Sincerely,
Amberly Arnal

Comment #41

I **Sent:** Thursday, August 21, 2014 11:42 AM
To: NGSS
Subject: Public Comment NGSS

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

Thank you,
Lynne Taylor, NC anti CC activist and concerned American citizen

Comment #42
From: Jean Barrera [mailto:jeanbc@q.com]
Sent: Thursday, August 21, 2014 11:45 AM
To: NGSS
Subject: Public Comment NGSS

- I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

- I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

- I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

The above is excerpted from data many people have studied and fully believe — I agree with them.

My own wish is that education of our children NOT be indoctrination to any degree — learning simple math by rote, then applying it as the math expands (along with the ages of students), does not frustrate kids, or teachers, WHEN THE TEACHERS ARE QUALIFIED TO TEACH AND ENJOY WHEN CHILDREN ARE HAPPY AS THEY LEARN.

Respectfully and hopefully sent,

Jean Barrera

Comment #43

From: Dan and Cindy Smith [mailto:dancindy@cox.net]
Sent: Thursday, August 21, 2014 12:05 PM
To: NGSS
Subject: Public Comment NGSS

I do not want the science standards to change.

- I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science Standards http://tinyurl.com/7cfas22

Sincerely,

Cindy Nicholas-Smith

Comment #44

From: lindseymassingham@yahoo.com [mailto:lindseymassingham@yahoo.com]
Sent: Thursday, August 21, 2014 12:20 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

To whom it may concern:

In regards to your request for public feedback, as a parent of school aged children and an early childhood educator, I am opposed to adopting inferior standards, such as the proposed Next Generation Science Standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

California's previous standards were clearly superior. Next Generation Science Standards are not going to prepare students for college level courses and beyond. I am opposed to the emphasis of inquiry skills over knowledge. I am concerned about the lack of foundational learning blocks in early grades.

In addition, I am also concerned the Next Generation Science Standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered. Thank you for your time and consideration.

Sincerely,

Lindsey Massingham

lindseymassingham@yahoo.com

Comment #45

From: rebecca [mailto:wb805@hotmail.com]
Sent: Thursday, August 21, 2014 12:46 PM
To: NGSS
Subject: Comments Regarding "Next Generation Science Standards"

Hello, and thank-you for taking public comment.

I am a tax-paying, voting wife and mother of three children in 9th, 6th, and 2nd grades. I am opposed to adopting inferior standards.

The Fordham institute gave NGSS a "C"-rating. California's current science standards were one of only 2 in the nation to receive an "A"-rating from Fordham. http://tinyurl.com/7cfas22.

It is important to me that my children receive the best possible education from the public school system that my tax dollars support.

I implore you to reject the "Next Generation Science Standards."

Sincerely,

Rebecca McClintock
Zip Code: 93433

Comment #46

From: ELEANOR HUTCHINS [mailto:screenbiz@yahoo.com]
Sent: Thursday, August 21, 2014 1:05 PM
To: NGSS
Subject: Public Comment NGSS

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham.
The State of The State Science Standards http://tinyurl.com/7cfas22
I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.
I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.
I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.
I am aware of the connection between NGSS and Common Core State Standards.
I will not be deceived by NGSS' repeated claims that these standards are "state-led".
I am opposed at the involvement of Achieve Inc. and WestEd.

Eleanor Hutchins

Comment #48

From: Char and Oliver Tanner [mailto:locotanners@yahoo.com]
Sent: Thursday, August 21, 2014 12:48 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.

Charlyn Tanner

Comment #49

From: Christine Jones [mailto:christine021@ca.rr.com]
Sent: Thursday, August 21, 2014 1:41 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Fordham Institute gave NGSS a C rating. California's current science standards were on of only 2 in the nation to receive and A rating from Fordham. http://tinyurl.com/7cfas22

I am also concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered.

I am aware of the connection between NGSS and CCSS. I am not fooled by NGSS' repeated claim of being "state led", and I am opposed to the involvement of Achieve, Inc. and WestEd.

Sincerely,
Christine Jones

Comment #50

From: Dana Racine [mailto:solitaryxi@aol.com]
Sent: Thursday, August 21, 2014 2:20 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

Dana Racine

Comment #51

From: Julie and Joel Chamberlain [mailto:joelnjulie@hotmail.com]
Sent: Thursday, August 21, 2014 2:21 PM
To: NGSS
Subject: Public Comment NGSS

To whom it may concern,

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science Standards http://tinyurl.com/7cfas22

I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

Thank you for your time,

Julie Chamberlain

Comment #52

From: Shannon Friedman [mailto:friedman.shannon@gmail.com]
Sent: Thursday, August 21, 2014 2:23 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

It seems to me that the content is driven with an agenda that doesn't represent all citizens...but specific citizen groups and this is an inappropriate forum for specific opinions. Should be education/knowledge based.

Thank you for your time,

Shannon Friedman

Comment #53

From: reneeramirez21 [mailto:reneeramirez21@yahoo.com]
Sent: Thursday, August 21, 2014 3:05 PM

To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Florida Institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.
http://tinyurl.com/7cfas22

Thank you

Comment #54

From: Kent_Charlotte Rieger [mailto:kcrieger@msn.com]
Sent: Thursday, August 21, 2014 3:46 PM
To: NGSS
Subject: Public Comment NGSS

- I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science Standards http://tinyurl.com/7cfas22

- I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

- I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

- I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

- I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

Thank you,

Charlotte Rieger
A concerned mother of 5

Comment #55

From: rusti@cox.net [mailto:rusti@cox.net]
Sent: Thursday, August 21, 2014 4:28 PM
To: NGSS
Subject: Public Comment NGSS

To Whom it May Concern:

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science standards http://tinyurl.com/7cfas22

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.
Rusti L. Dixon

Comment #56

From: jrf116@comcast.net [mailto:jrf116@comcast.net]
Sent: Thursday, August 21, 2014 5:46 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

Comment #57

From: Meaghan Hernandez [mailto:meaghanm143@sbcglobal.net]
Sent: Thursday, August 21, 2014 6:35 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

Here is my feedback:
I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered.
Sincerely,
Meaghan Hernandez

Comment #58

From: suzy woodley [mailto:runnerteacher78@gmail.com]
Sent: Thursday, August 21, 2014 6:54 PM
To: NGSS
Subject: next gen implementation plan

1. the resources should be completed before implementation.
2. the standards should be cut down and simplified in vocabulary and ideas (even more than the red summarized portions under the performance standards).
3. the standards are written as all teachers are professional scientists.. they are not. its not that they are not educated or intelligent but the amount of detail and content is too intense for one teacher. alot of content training is necessary and should be established as school specialists: earth, physical, life science and then collaborated to create an implementation system of the material. this would be easier if the resources were available before implementation in the class. if the teachers were trained with the resources before implementation.
4. the standards need to be reduced before implementation begins. I love science and believe that it should be taught in elementary to a greater extent. i have taught middle school for 8 years and now will be a stem teacher for k to 6. i was reviewing the standards for 6th grade and find that all math and language arts would have to be taught through science the entire year. this is very egotistical for the scientist to assume this. It needs to be reevaluated as to the amount of time it takes to do each performance standards, along with elementary math topics, art, music, history ,language arts. i know that math and language arts can be taught through science (and i'm all for this PART of the school year) but they can also be taught through music, history, art and literature. The science standards take science to the extreme. there is not enough time in the year to cover all of them in detail and well.

thank you
suzy woodley

Comment #59

From: Julie Bingham [mailto:justaddart12@gmail.com]
Sent: Thursday, August 21, 2014 7:04 PM
To: NGSS
Subject: Generation Science Standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

Julie Bingham
mother of 5

Comment #60

From: bruinette [mailto:bruinette0105@yahoo.com]
Sent: Thursday, August 21, 2014 7:04 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered.

Please stop dumbing down education for American children.

--jean uyemori

Comment #61

From: Lindsey Stacy [mailto:lindseystacy@yahoo.com]
Sent: Thursday, August 21, 2014 8:33 PM
To: NGSS
Subject: Public Comment NGSS

I am aware of the connection between NGSS and Common Core State Standards.
I will not be deceived by NGSS's repeated claims that these standards are state-led.
I am opposed at the involvement of Achieve, Inc. and WestEd.

Lindsey Perry
(916) 521-5215

Comment #62

From: carmen@gottahavesmore.com [mailto:info@gottahavesmore.com]
Sent: Thursday, August 21, 2014 9:43 PM
To: NGSS
Subject: Next Generation Science Standards - Feedback

1. I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.http://tinyurl.com/7cfas22

2. I am opposed to the emphasis of inquiry skills over knowledge. I am also concerned about the lack of foundational learning blocks in early grades.

3. I am aware of the connection between NGSS & CCSS. I am not fooled by NGSS' repeated claim of being "state-led", and I am opposed to the involvement of Achieve, Inc. and WestEd.

4. I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered.

Carmen Lindner
Marina Del Rey, CA 90292

Carmen Lindner
Gotta Have S'more
www.GottaHaveSmore.com
1-888-957-SMORE (6673)

Comment #63

From: Kate Alva [mailto:katealva@yahoo.com]
Sent: Thursday, August 21, 2014 9:52 PM
To: NGSS
Subject: Public Comment NGSS

I am a third grade, Nationally Board certified teacher.
The standards are not developmentally appropriate in the lower grades.
I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham.
The State of The State Science Standards http://tinyurl.com/7cfas22
- I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.
- I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

Comment #64

From: Kay Antunez de Mayolo [mailto:kayantunez@gmail.com]
Sent: Friday, August 22, 2014 7:40 AM
To: NGSS
Subject: Comments - NGSS implementation plan

Thanks you for this opportunity to provide comments regarding the California NGSS implementation plan draft. This is an historic moment for California students and their teachers.

I began my career as a secondary science educator in 1970 - the same year of the very first "Earth Day". There was no curriculum to guide me to teach my students well - as the song would encourage all of us - in fact, I had no guidance of what to teach my 7-9th grade students for that inaugural year.

Nonetheless we did participate in a small Earth Day event in San Luis Obispo - and every year henceforth I have help children remember that important "call to action".

Now 44 years later, and two years into retirement, I can reflect on all the movements and shifts regarding science education policy in California. I have participated in many California Science Teacher Association conferences as well as the National Science Teachers Association conferences when held in our state and taken note of the trends in what is happening in both curriculum and teacher professional learning. For the last 25 years of my career I was a practicing "environmental educator", serving as the state coordinator for the Project Learning Tree program sponsored by the California Department of Forestry and Fire Protection.

What I can say looking back into these many years of multiple efforts to engage students and teachers in high quality science education and then the same for environmental education - is that we made good efforts but have yet an enormous amount of work to do if we hope to create a science and environmental literate citizenry. There is so much work to do.

So one of my first reactions to retirement was - wow - how can I be involved in the NGSS implementation - it has such good attributes to reaching a high standard for science education. And then - more important, how can I help influence that the CA NGSS also embed the important science concepts that underpin environmental learning.

PLEASE NOTE THE FOLLOWING COMMENTS IN YOUR PUBLIC RECORD RECEIVED IN THE REVIEW OF THE NGSS IMPLEMENTATION PLAN:

1. The California Board of Education approved Environmental Principles and Concepts (EP&Cs) need to be explicitly addressed and cited in the plan.
2. There needs to be teacher and administrator professional learning regarding the EP&Cs in all NGSS efforts.
3. Future textbook adoptions will be required to incorporate the EP&Cs - therefore the adoption trainings need to also address the EP&Cs.
4. It should also be noted that the EP&Cs align with the approach of the NGSS that is, by using systems thinking and linking crosscutting concepts.
5. Finally, in order for our students to achieve environmental and science literacy they need to be taught these fundamental concepts and ways of looking at our world -

especially in light of the certain fact that THEY will be the ones to lead and confront the environmental, scientific and economic challenges of the 21st century.

Sincerely Submitted by:

Kay Antunez de Mayolo
PO Box 77
Eagleville, CA 98110

Comment #65

From: Steve Houston [mailto:steveandleslie@cox.net]
Sent: Friday, August 22, 2014 8:35 AM
To: NGSS
Subject: Science Standards

Greetings,

I was informed that you are proposing to drop the current California Science standards that received an excellent rating.
It has been brought to my attention that you are going to adopt Next Generation Science standards which only recieved a C rating.
Does this make sense when we as a nation are in great need for our next generation to excel in Math and Science?
As a parent and resident of California I strongly oppose the NGSS. Unless of course it is your intent to continue to dumb down America as it seems you in the government and education system are hell bent on doing. Parents will pull their kids from your inferior education indoctrination system in droves if you push through with this and the Common Core.

Wake up and do the right thing.
Sincerely,

Leslie Houston

Comment #66

From: Kim Evans [mailto:kevans600@gmail.com]
Sent: Friday, August 22, 2014 8:41 AM
To: NGSS
Subject: Public Comment NGSS

To Whom it may concern

- I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science Standardshttp://tinyurl.com/7cfas22

- I am opposed to the emphasis of inquiry skills over knowledge. I am also distressed about the lack of foundational learning blocks in early grades.

- I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered.

- I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

- I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.
Kim Evans
Mother of 5
Concerned and Involved Parent

Comment #67

From: Lori Anderson [mailto:info@tommyandloriyoga.com]
Sent: Friday, August 22, 2014 9:40 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

Lori Anderson
Concerned parent

Comment #68

From: Danea Burleson [mailto:danea3@sbcglobal.net]
Sent: Friday, August 22, 2014 10:00 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

To whom it may concern,

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only
2 in the nation to receive an A rating from Fordham.
http://tinyurl.com/7cfas22

Danea Burleson

Comment #69

From: Jesse Bluma [mailto:amulb@sbcglobal.net]
Sent: Friday, August 22, 2014 11:53 AM
To: NGSS
Subject: Feedback for Next Generation Science Standards.

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only 2 in the nation to receive an A rating from Fordham. http://tinyurl.com/7cfas22

-Jesse Bluma

Comment #70

From: knewhan@aol.com [mailto:knewhan@aol.com]
Sent: Friday, August 22, 2014 4:24 PM
To: NGSS
Subject: Public Comment NGSS

I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

Regards,
Karen Newhan

Comment #71

From: David Stronck [mailto:david.stronck@csueastbay.edu]
Sent: Friday, August 22, 2014 7:58 PM
To: NGSS
Subject: implementing NGSS

The NGSS are excellent especially because of the emphasis

on in-depth conceptual understanding that starts with hands-on observations and experiences. Many teachers will need new resources and training to be able to implement these standards. Please recommend adequate funding to provide motivating and valuable science instruction

David R. Stronck, Ph.D.
Pofessor
Science Educator
Department of Teacher Education
California State University, East Bay

Comment #72

From: Glenn Benham [mailto:gbenham1@yahoo.com]
Sent: Friday, August 22, 2014 8:57 PM
To: NGSS
Subject: University of California policy hurts implementation of NGSS

Hi:
The University of California's refusal to accept Earth Science classes as "D" level laboratory science courses for admittance (even though individual astronomy and geology classes have approved as D level) is preventing college bound students from getting high quality Earth science classes. I understand the traditional view that biology, chemistry and physics are the gate keepers to UC admittance, but with the increased value put on Earth Science by NGSS, it seems that the UC system is mired in its antiquated NCLB-like thinking.

How do we implement NGSS standards when counselors will not put college bound students into classes that will not help them get into a UC, and the UCs do not accept Earth Science classes as other than a science elective? If the state is to move forward with successful implementation of NGSS, it needs to make some change in the acceptance policy for the UC system (or we can get used to sending our students that are excited about astronomy and geology to other states like Nevada and Arizona for college).

Glenn Benham
Los Osos High School
Rancho Cucamonga Ca

Comment #73

Sent: Friday, August 22, 2014 10:31 PM
To: NGSS
Subject: NGSS Comments

I am a middle school teacher and I have looked at the standards for 6-8th grade. I like the fact that so far, I have been told that it will be up to the district to decide how the standards will be taught, either integrated at each grade level or kept the way it is currently teaching Earth, Life and Physical at different grade levels. After reviewing the NGSS, I think that if you want it fully integrated, you need to divide it by grade level so it is clear who is teaching what. I also think that if you allow districts to decide, kids that switch schools at any of the grade levels will miss out on huge chunks of important material. Thank you for your time.

Pamela Williams.

Comment #74

From: Matthew Snyder [mailto:organicmatt@att.net]
Sent: Saturday, August 23, 2014 8:32 AM
To: NGSS
Subject: Feedback for next generation science standards

I am opposed to adopting inferior standards. The Fordham institute gave NGSS a C rating. California's current science standards were one of only two in the nation to receive an A rating from Fordham.

One Nation under God,

Matthew Snyder
1726 Blue Water Ln
San Marcos CA 92078
760.744.2460
organicmatt@att.net

Comment #75

From: Sue Boudreau [mailto:sueboudreau2004@yahoo.com]
Sent: Saturday, August 23, 2014 8:55 AM
To: NGSS; admin@cascience.org
Subject: Input for the Ca NGSS middle school progression.

Hello,

I am writing to suggest changes to the progression of the NGSS for middle grades. I am a middle school science teacher with 30 years experience, including curriculum writing for nationally distributed materials both in print (SEPUP) and online (nextlesson.org). I am an advocate of project based learning, student choice, relevance and welcome well-thought out change, which is what the NGSS represent by and large.

Currently, the NGSS middle school progression is essentially simple biology in 6th, medium in 7th and harder stuff in 8th grade. Similarly for chemistry and physics concepts.

I can see the logic to this, and in an ideal world where science departments had stable and collegial staff, this could work. In a world where students remember detailed concepts from one year to the next, this could work. 'Spiraling' is an aspiration.

However, in the real world, teaching staff has a very high turn over, particularly in inner city schools. Even without turn over, the culture of teaching is still very individualistic, with colleagues using wildly different teaching styles and with inadequate supervision from over-stretched school leaders. Coordination across grade levels would therefore only be widely workable if teachers were made to teach pre-written curriculum. This would take away the ability of teachers to create their own ways to reach standards - a huge satisfier for the top performers of the profession. Teachers need to innovate to teach innovation. You would lose the very teachers the profession and our children most need to spearhead much needed change.

More importantly, no one remembers detailed information from one year to the next – passwords for an old account etc. Children will not remember what they learned about cells and respiration in 6th grade to build on that in the 7th grade energy and ecosystems unit. Teachers will have to re-teach concepts learned in prior grade levels, taking away a great deal of valuable instructional time. Time which could be better spent building a robust understanding of say, how all life is connected across space (ecology) and time (evolution and genetic).

The arc of a story is invaluable to link a year of study together. It makes far more intuitive sense to teachers, students and parents and leads to deep understanding of systems we can all get our hands around – "How does the earth work?" "What is matter and energy, and how do they interact?" "What makes things happen in the universe?" etc.

If the story arc has to take 3 years, its much less likely to be properly tied together in the holistic way the NGSS aspires to. It's much less likely to be workable on the ground, with real teachers, in real departments, in real schools and with our real children who long for relevance, choice, meaning and love the great stories science can tell. I strongly recommend you review the progression of middle school science standards.

Sue Boudreau, Science Teacher, Orinda Intermediate School, Orinda, California
Cell: 510 393 9252
Blog: http://takeactionscience.wordpress.com

Comment #76

From: Jeff Parish [mailto:JParish@tcsd.k12.ca.us]
Sent: Saturday, August 23, 2014 9:35 AM
To: NGSS
Subject: Implementation of NGSS

To Whom It May Concern,

I applaud the state of California adopting and moving ahead with the implementation of NGSS. This is a much needed step in the right direction as I am of the opinion that our previous set of standards left out so many important science concepts.

Having said that, I believe strongly that it is imperative the state of CA fully support science programs in public schools by not only allocating, but specifically setting aside monetary resources for full implementation. Along with a financial commitment to great science education for California's children, there needs to also be a mandated directive that gives science education a place in the school day for science EVERYDAY. Students cannot be expected to learn and master science concepts if it is taught on a hit and miss basis.

Along with support for standards implementation, there needs to be a commitment to ongoing professional development, not only for beginning teachers, but for those of us who have taught using the old standards. NGSS is a big departure from the old way of teaching and assessing standards and those of us who are seasoned educators will need just as much support as those just starting out. I urge our state Department of Education to make a timeline for professional development as they make one for standards implementation.

Finally, thank you for the opportunity for those of us who work directly with children to have our voice heard in these matters. At last year's CSTA conference I was very pleased with a report from the standards committee and all they are doing to make thoughtful and deliberate decisions regarding NGSS in California. I was also pleased that they, as well as our State Dept. of Education call for and thoughtfully consider the thoughts and ideas of us classroom teachers. This means a lot to me and my colleagues.

Best regards,

Jeff Parish
8th Grade Science Educator

Cherry Ave. Middle School
Tulare City School District
Tulare, CA 93274

Comment #77

From: askdrsp@aol.com [mailto:askdrsp@aol.com]
Sent: Saturday, August 23, 2014 11:40 AM
To: NGSS
Subject: implementation of NGSS

Susan Pritchard, Ph.D.
Washington Middle School, La Habra, CA

Dear NGSS:

New standards are warmly welcomed ... with the caveat that they are implemented in a reasonable, timely, well-financed, and equally shared importance as the Language Arts and Mathematics Common Core standards is receiving. What should this look like? Please allow me to comment on each of the 8 parts of the Implementation plan:

First of all, my name is Susan Pritchard and I am a teacher of seventh and eighth graders at Washington Middle School in La Habra, CA. I am privileged to teach both science and engineering classes. I have been actively involved at the state level in both science and STEM education through the California Science Teachers Association and California Teachers Advisory Council. I would like to offer a few words of comment, respectfully, regarding the CA NGSS Implementation Plan. If you need, you may contact me at this email address from which I am sending this message.

Respectfully,
Dr. P.

The eight guiding strategies for the CA NGSS systems implementation are:

1. Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.

- My comment on this first guiding strategy:
    - High quality professional learning opportunities for educators is ALWAYS needed … and as a state-wide involved STEM educator, I applaud this as the first strategy. I would add, though, that WITHOUT HIGHLY QUALIFIED TEACHERS IN THE MIDDLE SCHOOLS WHO ACTUALLY HAVE A SCIENCE CREDENTIAL, the professional development will most likely be inefficient in educating equitably the vast number of middle school teachers who are currently teaching science in the Middle School Level WITHOUT PROPER CREDENTIALLING IN SCIENCE. True conversation

and action is required to ensure all Middle School science teachers hold a science credential or "supplemental" BECAUSE OF THE NCLB LOOPHOLE WHICH ALLOWS MIDDLE SCHOOL SCIENCE TO BE "CORED" WITH ANOTHER SUBJECT. The content of the Middle School Level standards is consistent with the need for proper science education for the EDUCATOR … BUT UNLESS THE STATE, MR. TORLAKSON, ADDRESSES THIS UNFAIR AND INEQUITABLE LOOPHOLE, NO AMOUNT OF MONEY, SHY OF MONEY TO CREDENTIAL THOSE WITHOUT A SCIENCE CREDENTIAL, WILL GIVE OUR STUDENTS, OUR FUTURE, EQUAL ACCESS TO TEACHERS WHO ARE HIGHLY QUALIFIED.

2. Provide CA NGSS-aligned instructional resources designed to meet the diverse needs of all students.

- My comment on this second guiding strategy:
    - Aligned instructional resources designed to meet the DIVERSE needs of all students is an excellent second strategy. Keep in mind that "diverse" is quite an "open-ended" descriptor in that there are such huge differences among the needs of our students, our future. Within this strategy, specific areas of concern seek answers to what amount of funding will be available to districts for: English Language Learners, Special Needs Students, GATE qualifying learners, and most importantly … for all students in terms of the vast amount, of both consumable and non-consumable materials, as well as the appropriate technology which enhances the learning NECESSARY TO ADEQUATELY AND EQUITABLY IMPLEMENT THE NGSS? With this latter concern in mind, how will the implementation plan ADDRESS THE ALWAYS EVOLVING USE OF TECHNOLOGY … IT IS CHANGING MONTHLY SOMETIMES … AND THE DIVERSE TECHNOLOGICAL DIVIDE THAT STILL EXISTS AMONG OUR SCHOOLS IN THIS GREAT STATE OF CALIFORNIA? In addition, the districts do have control of the funding and how it is spent, within the plan they submit to the state yearly. However, perhaps funding, or at least a specific minimum percentage of funding, for STEM would be quite useful to leveling the field for all of our students throughout the state. When the now-defunct Eisenhower Funding was targeted to Science, the districts spent more equitably on science instruction … something to consider.

3. *Develop and transition to CA NGSS-aligned assessment systems to inform instruction, establish priorities for professional learning, and provide tools for accountability.*

- My comment on this third guiding strategy:
    - Assessment is huge and I was honored and privileged to be chosen by ETS to attend the first of two-day Stakeholder Sessions in Sacramento this past July. It was eye-opening to me that so many groups wanted summative assessment BY THE STATE AT ALMOST ALL GRADE LEVELS because the constant comment I heard was that without the TESTING AT EACH GRADE LEVEL, the districts would not teach the science. The testing is considered the mandate to the district rather than what it should be … an effective way to gather data that is used to improve the best teaching practices for the students. It was particularly feared, from what I heard in different conversations, that without state testing, little science would be taught at grades K – 5 in particular. As a counterpoint to this fear, during the two day sessions where our groups were recorded, I constantly addressed my comments to Mr. Torlakson asking that he

consider MANDATING MINIMUM TEACHING MINUTES PER GRADE LEVEL, K – 8, TO ENSURE THE DISTRICTS ARE COMPLYING. I understand that mandating does not always mean QUALITY … that is addressed in number 1 above, but it is true that a district may hinder the teaching of science IN LIEU OF Language Arts and/or mathematics unless there is SPECIFIC TEACHING TIME MANDATED BY THE STATE. The test SHOULD NOT be the reason science is taught. Our students deserve the best, and providing mandated minimum teaching times at least attempts to level the playing field for our students, our future. The assessments, both formative and summative, should be used to advise best practices so educators can constantly hone their craft and do a better job of facilitating, questioning, encouraging, and promoting the collaboration, creativity, communication, and critical thinking of our students, our future.

4. Collaborate with parents, guardians, and the early childhood and expanded learning communities to integrate the CA NGSS into programs and activities beyond the K–12 school setting.

- My comment on this fourth guiding strategy:
    - Collaboration with all members of the community is extremely beneficial in enhancing student learned outcomes. I applaud the committee for this inclusion. More funding for more community STEM Celebrations are needed. We must provide more opportunities to involve everyone in STEM … this is the vision and it can be achieved.

5. Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.

- My comment on this fifth guiding strategy:
    - For years the higher education communities have been reaching out to K-12 educators because many grant opportunities require this type of networking and I believe it is evolving into a wonderful working community. More and more businesses are involved as well and many times it is self-fulfilling because of their workforce needs. That being said, it is great to see this as one of the strategies for implementing the NGSS. Nothing is stopping California from becoming the MODEL STATE FOR NGSS, utilizing the entire “village” to ensure the success of our students, our future.

6. Seek, create, and disseminate resources to support stakeholders as the CA NGSS systems implementation moves forward.

- My comment on this sixth guiding strategy*:*
    - Useful resources are often the key to fueling the sustainability of a program. The proper use of the internet makes this affordable and easy to update often. As always, funding is key, and this is perhaps a strategy best connected to strategy 5 whereby the state can offer more incentives to businesses to share and support K-12 education. In addition, the state could offer tuition pay-back for graduates who offer support for K-12 education in specifically state-defined opportunities.

7. Design and establish systems of effective communication among stakeholders to continuously identify areas of need and disseminate information.

- My comment on this seventh guiding strategy:
    - Communication is critical … and it is not just by the internet. Face-to-face is also powerful.

8. Build coalitions to ensure a common message and to sustain momentum during implementation.

- My comment on this eighth guiding strategy:

- Coalitions are often helpful, but also easy to lose momentum themselves. An umbrella of support is needed and the state would be wise to choose local districts as official branches for dissemination of information AS PARTNERS WITH THE COUNTY DEPTARMTENTS OF EDUCATION.

Comment #78

From: Melissa Fields [mailto:fieldsmelissa@dublinusd.net]
Sent: Saturday, August 23, 2014 12:09 PM
To: NGSS
Subject: NGSS implementation - public comment

One key to Next Gen's success is training and professional development for teachers. There MUST be money available to send teachers to conferences and/or bring training to teachers. Unfortunately, most district level administrators do not have a science background and don't even know what our standards are or what they entail. When these people are in charge of teacher trainings, science is last on their list. CCSS are embedded into Next Gen yet they didn't even bother to send science teachers to the CCSS trainings. We need training early and often to make Next Gen a reality. There were millions of dollars spent training teachers on Common Core, we need the same sort of commitment to science. Or we will have a nice set of standards and a new framework that collects dust on a shelf because no one is trained on them.

Additionally, Science HAS to be an integral part of the way API is calculated. If science continues to be >3%, it will NOT get the respect that it deserves. For the past few years the only grade levels that had any, albeit minimal, power were 5th and 8th (for elementary and middle - I am not sure how it figures in to high school's API) because that is when the kids were tested. Even though they were tested, because the test "barely counts" (as stated by my now-former principal), science classes at my middle school were over crowded, scheduled last priority, didn't have aides, teachers weren't sent to trainings unless we begged or asked PTA to fund it, etc. etc. If our test counts as a 3rd (or 4th if history is to be valued as well) science will start getting the teacher training, the extra sections, the interventions, the GATE classes, etc. etc. that it should.

Thank you,
Melissa Fields

14 years teaching middle school science (mostly 8th grade but 6th/7th as well)
2 years teaching high school science (Biology and Chemistry)
Currently teaching Earth Science and Biology at the continuation high school (first year)

Comment #79

From: Laura Dax Honda [mailto:hondafamily1@comcast.net]
Sent: Saturday, August 23, 2014 12:12 PM
To: NGSS
Subject: NGSS comments

I would like to add my thoughts about the NGSS. I believe very strongly that the (EEI) Education and the Environment Initiative's Environmental Principles and Concepts must be a major part of of NGSS. California has approved and committed to implementing the EP&Cs. I believe that all educators must become familiar with the EP&Cs and be prepared to incorporate them in their educational plans. It is law that all future textbooks will incorporate the EP&Cs and the EP&Cs align perfectly with the NGSS philosophy and approach to teaching. It is imperative that our children become environmentally literate in order to become stewards or our planet and the EP&Cs when implemented in all classrooms will help to make that happen.

Thank you for taking my thoughts into consideration.
Laura Dax Honda
Fourth Grade Teacher
Manor School
150 Oak Manor
Fairfax, CA 94930
Teacher Ambassador for EEI

Comment #80

From: Raquel Pinderhughes [mailto:raquel@rootsofsuccess.org]
Sent: Saturday, August 23, 2014 1:15 PM
To: NGSS; Raquel Pinderhughes; Raquel O Rivera Pinderhuges
Subject: Public Comment: NGSS Systems Implementation Plan for California

Re: Call for Public Comment on Next Generation Science Standards Systems Implementation Plan for California

To whom it may concern:

I am writing in order to submit public comment on Next Generation Science Standards Systems Implementation Plan for California. I want to comment on two critical issues related to the plan.

First, as others have pointed out, the implementation plan needs to explicitly cite and address the state's statutory commitment to teaching California's approved environmental principles and concepts (EP&Cs). For example, teacher and administrator professional learning around NGSS should familiarize all educators with the EP&Cs and prepare them to deliver instruction accordingly because: (1) future state textbook adoptions are required under law to incorporate the EP&Cs; (2) the EP&Cs

align perfectly with the philosophy and approach of NGSS (systems thinking, crosscutting concepts, etc.); and (3) our children absolutely must be environmentally literate if they are to successfully confront the environmental and economic challenges of the 21st century.

Second, as we promote environmental literacy and education in California it is essential that we acknowledge the need to address the achievement gap. Across the state, black and Hispanic students are much more likely than white or Asian students to fall behind in school and drop out, and much less likely to graduate from high school, acquire a college or advanced degree, or earn a middle-class living. Many of these students attend schools in communities heavily impacted by poverty and environmental problems. Students who come from communities that are heavily impacted by environmental problems and injustices must be provided with the knowledge, skills and understanding of environmental topics and concerns they need to analyze and make informed decisions about environmental issues and pursue environmental and STEM-based careers. Ensuring that environmental educators have access to innovative approaches, strategies, and instructional materials that are relevant, interesting, and effective for students who are struggling in school is crucial, both for individuals and society as a whole.

Please make sure that my comments reach decision makers implementing the Next Generation Science Standards Systems Implementation Plan for California.

Respectfully,

Dr. Raquel Pinderhughes
Professor of Urban Studies and Planning and Environmental Studies
San Francisco State University
Executive Director, Roots of Success Environmental Literacy Project

Raquel Pinderhughes, Ph.D.
Professor of Urban Studies & Planning, San Francisco State University
Executive Director, Roots of Success
rootsofsuccess.org | Facebook | Community of Practice

Comment #81

From: lsnourse@aol.com [mailto:lsnourse@aol.com]
Sent: Saturday, August 23, 2014 2:48 PM
To: NGSS
Subject: comments on NGSS for California

While I am in favor of an integrated curriculum for the middle school level I am struggling to understand the emphasis that has been chosen for each grade level. The absence of chemistry in the 8th grade is frustrating and somewhat upsetting. The move

of so much Life Science to 8th grade seems unnecessary. Some of the physical science topics for 6th grade will be a stretch to teach adequately.

The idea that students often do not take any earth science beyond middle school is correct. But to expect them to remember what they learn in 8th grade is unrealistic. A more appropriate approach would be to increase expectations at the high school level and require 3 years of science for graduation - one of those years being Earth Science or Physics.

Middle School should still be foundational. It feels that much of the new framework will weaken that foundation.

Teaching a topic to 6th graders requires a different approach than teaching that same topic to 8th graders. This shift may require teachers to shift what grade level they teach in order to continue to teach to their expertise yet 6th grade teachers are not always ready to handle 8th graders (and vice versa). While this is a different issue than a straight curriculum issue it should still be considered.

lsnourse@aol.com

Comment #82

From: Personal [mailto:clarktellart@yahoo.com]
Sent: Saturday, August 23, 2014 5:10 PM
To: NGSS
Subject: NGSS Standards Opposition

I am aware of the connection between NGSS &CCSS. I am not fooled by NGSS' claim of being "state-led", and I am opposed to the involvement of Achieve, Inc. and WestEd.

Best Regards

Matt Ferguson
Ambient Productions
661-755-8655

Comment #83

From: E. Orlean Koehle [mailto:caleagle@sbcglobal.net]
Sent: Saturday, August 23, 2014 5:45 PM
To: NGSS
Subject: my comment on NGSS

Please see my attached letter to you urging you to please rescind your approval of the NGSS.

Formal Letter from Eagle Forum of California

Date: August 23, 2014

RE: Public Comment on the NGSS

Dear California Department of Education:

I am writing to give you my feedback regarding your proposed adoption of the Next Generation Science Standards. As a former public school teacher who has taught biology and as an author and researcher who has written about the NGSS, I am opposed to them and urge that you follow the example of other States and reject them for the following reasons:

1. They are inferior to the standards that California presently has which was given an A rating by the Fordham Institute, while NGSS has been given a C rating.
2. They are teaching much pseudo-science to indoctrinate students to one certain biased agenda with no other viewpoint allowed. This is the main reason Wyoming has voted to reject them. If students believe what they are taught in the NGSS standards about climate change or global warming, they would soon be voting for all coal mines to be shut down. Coal is one of the main industries in the State of Wyoming.
3. They use inquiry skills in place of actual knowledge.
4. The standards fail to include essential math skills that will make it so that chemistry and physics cannot me taught in high school because they will not have the math to support them.
5. The standards are religiously non-neutral with a heavy emphasis on evolution being taught as scientific fact, when it is still just a theory.
6. The NGSS are heavily connected to Common Core, written by the same chief writers of Common Core, such as Achieve.net. (http://www.nextgenerationsceince.org/toward-integration-ngss-and-common-core-classroom)
7. They are not state-written and thus in violation of the Tenth Amendment and three federal laws.

E. Orlean Koehle, State President
Director of Californians United Against Common Core
PO Box 3553, Santa Rosa, CA 95404
www.eagleforumofcalifornia.org
e-mail caleagle@sbcglobal.net 707-539-8393

Comment #84

From: jfoster [mailto:j.select.biz@gmail.com]
Sent: Saturday, August 23, 2014 7:35 PM
To: NGSS
Subject: NGSS feedback

PROS
-**cross cutting concepts** are brilliant; these will greatly facilitate scientific thinking skills, which are so much more valuable then the set of facts which comprised most of our former instructional goals
-**science & engineering practices** are also valuable additions that are not formerly stressed so much in the CA teaching standards
-the **DCI** standards are clear, relevant, specific, and appropriately limiting as to the scope of instruction, per the cited instructional *boundaries.*
-the vertical articulation among the grade levels seems sensible
-content identified for instruction seems sensible
-the integration of technology will be of great value to our students and our nation
-the NGSS approach to science instruction will promote greater critical thinking and scientific thinking than former CA standards, which focused more often than not on facts vs scientific reasoning
-the call for models will not only deepen student understanding, it also more successfully captures visual and tactile learning modalities
-overall, my greatest take away is that the NGSS promotes scientific thinking while CA standards promoted little more than learning facts (which can easily be accessed on the web and are very quickly forgotten after learning).

CONS
-schools with limited financial resources will find it difficult to offer students the needed resources for building models, for purchasing existing models, and the necessary computer access (and thus familiarity with computing skills)... the NGSS will inadvertently discriminate against poorer school districts who will find themselves I'll equipped with the tools needed for success with the NGSS.
-the shift in instructional methods to employ NGSS vs former standards is vast! Without a great deal of teacher training and subsequent support, teachers will very likely struggle to successfully implement the NGSS.
-many districts would find it formidable to find the required resources to adequately prepare their teachers for this shift - both financial and time resources
-there is concern that too few of those chosen to develop the NGSS and possibly the subsequent assessments for the NGSS have the appropriate educational (classroom) experience needed to offer realistic feedback and that the consequence of this may be a flawed product
-there is the concern that what colleges expect is not necessarily what NGSS high schools will provide and therefore the NGSS may be shortchanging our high school

students - will courses satisfy credit requirements? What about honors or APP courses? How will these work with NGSS?
-the fact that CA middle schools may choose between the integrated or discipline specific model seems to open a plethora of concerns:
(1) assessments will not adequately address both models, so assessment results for this group have questionable merit unless seperate assessments are developed for both models.
(2)

Comment #85

From: Jennifer Foster [mailto:j.select.biz@gmail.com]
Sent: Saturday, August 23, 2014 8:16 PM
To: NGSS
Subject: NGSS feedback by Aug. 25

PROS

☐ **cross cutting concepts** are brilliant; these will greatly facilitate scientific thinking skills, which are so much more valuable then the set of facts which comprised most of our former instructional goals

☐ **science & engineering practices** are also valuable additions that are not formerly stressed so much in the CA teaching standards

☐ the **DCI** standards are clear, relevant, specific, and appropriately limiting as to the scope of instruction, per the cited instructional *boundaries.* CA has made good improvements, qualifiers, to the national NGSS document. Good work!

☐ the vertical articulation among the grade levels seems sensible

☐ content identified for instruction seems sensible

☐ the integration of technology will be of great value to our students and our nation

☐ the NGSS approach to science instruction will promote greater critical thinking and scientific thinking than former CA standards, which focused more often than not on facts vs scientific reasoning

☐ the call for models will not only deepen student understanding, it also more successfully captures visual and tactile learning modalities

☐ overall, my greatest take away is that the NGSS promotes scientific thinking while CA standards promoted little more than learning facts (which can easily be accessed on the web and are very quickly forgotten after learning).

CONS

☐ schools with limited financial resources will find it difficult to offer students the needed resources for building models, for purchasing existing models, and the necessary computer access (and thus familiarity with computing skills)... the NGSS will inadvertently discriminate against poorer school districts who will find themselves I'll equipped with the tools needed for success with the NGSS.

☐ the shift in instructional methods to employ NGSS vs former standards is vast! Without a great deal of teacher training and subsequent support, teachers will very likely struggle to successfully implement the NGSS.

☐ many districts would find it formidable to find the required resources to adequately prepare their teachers for this shift - both financial and time resources

☐ there is concern that too few of those chosen to develop the NGSS and possibly the subsequent assessments for the NGSS have the appropriate educational (classroom) experience needed to offer realistic feedback and that the consequence of this may be a flawed product

☐ there is the concern that what colleges expect is not necessarily what NGSS high schools will provide and therefore the NGSS may be shortchanging our high school students - will courses satisfy credit requirements? What about honors or APP courses? How will these work with NGSS?

☐ the fact that CA middle schools will among three different models is confusing and, to my thinking, very problematic:

- o assessments will not adequately address all three models, so assessment results for this group have questionable merit unless seperate assessments are developed for each model (unnecessary expense).

- o not all middle schools target the same grades: some are 6-8; some are 7-8; some are 7-9...it seems that the variants allowed at middle school may cause less-than-smooth transitions from elementary to middle; from middle to high schools.

- o what about students who move? if their school chose a different model from the new school, won't that adversely impact their learning?

☐ assessing NGSS will be a very costly, complex process to do correctly

☐ assessments at the high school level present numerous issues:

- o if testing in grade 12, students are burned out and may do poorly (skewed results);

- o students in grade 11 may test poorly due to the inordinate number of other tests they must take in this year (skewed results);

- o students in grades 10 or 9 have had insufficient exposure to disciplinary content goals to test all DCIs for high school. This presents more questions than answers!

☐ computer based testing, which appears to be a must for NGSS to be properly assessed, is very problematic in itself:

- o purchasing sufficient computers is very costly

    - ☐ cost of computers

☐ cost of tech support

☐ cost of dedicated servers

- not all schools have adequate computer labs (esp. title 1 districts)

- not all students are exposed to the most basic of computer skills (esp. title 1 districts)

☐ the likelihood that teachers will have received adequate training and support to launch into NGSS is very slim; at best, perhaps four full days PD will be offered to most teachers per year

☐ there are insufficient support resources available at this time to replace current curricular materials aligned to the CA teaching standards; the likelihood that publishers claiming their NGSS alignment is aligned to NGSS is slim. Most likely alignment will be weak and spotty

☐ due to districts already being overwhelmed making the Common Core transition, some districts will wait until the last minute to also make the jump to NGSS; this will lead to very weak test scores, since the difference between the current standards and the NGSS are so different and the necessary adjustments to teaching approaches will have a learning curve

☐ unless computer-based testing allows any/all students to access an audio translation to English, weak reading skills will compound weak computer skills for unreliable test results

Jennifer Foster
Earth & Life Science Teacher
Rancho Medanos Jr. High

Comment #86

From: Laurie Pennington [mailto:lpennington@pausd.org]
Sent: Saturday, August 23, 2014 11:28 PM
To: NGSS
Subject: Comments about NGSS Implementation

To Whom It May Concern:

I appreciate that the needs for professional learning are addressed in the plan, but is there also a plan for funding this professional learning? There should be time allotted for curriculum development and adaptation and ways for teachers to collaborate with others

on successes and failures. This idea is in the plan, but teachers shouldn't be expected to volunteer more of their own time in order to have this happen.

Another concern that I have heard, especially in my District, PAUSD, is in the 9-12 standards there is the Earth and Space Science component. While we all like the inclusion of Earth and Space Science, our high schools tend to lean toward the traditional model of Biology, Chemistry, and Physics. With needing to prepare our students for college assessments, such as the SAT2, and while trying to get alternative courses approved by the University of California, we are wondering if our traditional 3-course system will need to be completely revamped. We are also wondering if there will be guidance from UC about what kind of courses they will be willing to accept -- for instance, Integrated Science usually counts as a physical science, but must span two years in order to earn "d" lab science credit.

I think what I am trying to say is that as we implement the NGSS, we need our state colleges and universities to be on board with changes in curriculum as well. We understand that part of this implementation is for the "success of students in career and college", but do the colleges understand that in order to cover all the standards, our traditional curriculum will need to change. It would be great if the colleges were instrumental in helping to support and define the changes that need to be made.

I hope that makes sense.

Sincerely,

Laurie Pennington
Instructional Supervisor, Science Dept.
Henry M. Gunn High School
lpennington@pausd.org

Comment #87

From: KARYMORTON [mailto:karymorton@comcast.net]
Sent: Sunday, August 24, 2014 1:09 PM
To: NGSS
Subject: Public Comment NGSS

To whom it may concern:

I am opposed to adopting inferior standards. California’s current science standards were one of two states in the nation to receive an “A” grade from Fordham Institute. Next Generation Science Standards has received a “C” grade from Fordham.

I am also opposed to the emphasis of inquiry skills over knowledge. I am distressed about the lack of foundational learning blocks in early grades. I am concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to purposefully skirt the mathematical demands inherent in the subjects covered. I am concerned the standards are religiously non-neutral, which would lead to indoctrination, not education.

Furthermore, I am aware of the connection between NGSS and Common Core State Standards. I will not be deceived by NGSS' repeated claims that these standards are "state-led". I am opposed at the involvement of Achieve Inc. and WestEd.

A concerned parent,
Kary Morton

Comment #88

From: Davidan [mailto:davidan@csufresno.edu]
Sent: Sunday, August 24, 2014 3:42 PM
To: NGSS
Subject: NGSS Implementation plan

Dear Colleagues,

I find the overall implementation plan for the Next Generation Science Standards to be an excellent approach to this complex and significant task. Having served on the SEP, there was always some anxiety among several committee members on what the implementation would emerge to be. I feel that this well conceived design will be successful as long as adequate funding accompanies the roll-outs and all other aspects of implantation.

Regards,

DAVID ANDREWS
Fresno State
Science and Math Education Center

Comment #89

From: McCluan, Jennifer [mailto:jennifer.mccluan@sduhsd.net]
Sent: Sunday, August 24, 2014 3:59 PM
To: NGSS
Subject: NGSS Implementation Plan Feedback

To Whom It May Concern:

My name is Jennifer McCluan, and I a 15 year veteran science teacher who is now also serving as a Science Teacher on Special Assignment (ToSA) for the San Dieguito Union High School District in southern California. As a military spouse, I have taught science (majority chemistry) classes in Florida, George, North Carolina, Rhode Island, and New York at the secondary and collegiate levels.

Thank you for taking the time to read and consider my input regarding the implementation plan for the NGSS in California, and for considering all contributors' feedback when making critical decision regarding our students' science education.

While I am a huge proponent of the changes the NGSS highlights are needed in science education (integration of three dimensions, students practices science rather than passively receiving information from teachers, increase in rigor, reduction is breadth to emphasize depth, etc.), I also recognize that these shifts can be overwhelming for science teachers who already put in 80+ hour weeks to prepare, deliver, and grade lessons/labs for classrooms of 40 students or more. I have organized my responses to the Implementation plan in broader themes below, rather than responding to each individual strategy addressed in the plan.

I am pleased to see professional development discussed and supported in such great detail in the Implementation Plan, but also know how difficult it is for science teachers to lose instructional time with their students during the school year to attend professional development training. I myself am facing this dilemma, as there are 10 workshops/conferences/trainings I would like to attend during the fall term as part of my new ToSA role, but I am still teaching part time, and time in the classroom is precious to teachers. My school and district has done an excellent job allow schools to adjust their schedules to make room for PLC work during late start days, but more time will be needed to really provide teachers with meaningful training and opportunities to redesign their curriculum. Teacher workshops, academies, etc. are all part of the implementation plan, but the majority occur during the school day. Few are available during the summer months, and the ones that are target elementary school educators, not middle/high school.

In a similar vein, instructional resources should be developed using a similar timeframe for 9-12 science education and K-8. Inevitably, K-8 resources are developed at a faster rate, and this sends a mixed message to educators, parents, and students alike. Teachers are hearing a message, NGSS is coming, we have time, but we don't have a great many resources for you to play and experiment with in your classrooms yet....this makes buy-in difficult.

All standards....all students. This is the most powerful takeaway from NGSS. The reality is, our current science model in high schools in California results in students who graduate having taken Earth Space and Biology, and this current model will not allow for them to see the physical science DCI of NGSS traditionally covered in Chemistry and Physics classes. Similarly, many students who take three years of high school science complete Biology, Chemistry, and Physics. In this case, they will see the life and

physical science components of DCI, but not Earth Space. While I appreciate the freedom that is given to local agencies to map their courses for middle and high school, I am very concerned that there is a fundamental conflict with adopting NGSS, and supporting a high school state requirement for graduation of two science classes. This is the 21st century; the K-12 Science Framework document and the NGSS authors point out what is obvious-we live in a world where our students need a better understanding of science and engineering. Requiring two years of science coursework in high school does not reflect this, and does not allow sufficient time to adequately address the DCI of life, physical, and Earth-Space science. Now seems to be the perfect opportunity to move away from our current policy of '2 years required; 3 years recommended" to AT LEAST 3 years required. It is ridiculous to me that a student can graduate from high school in California only to find that the college they wish to attend in North Carolina requires three years of science, and they don't meet that requirement. True, earth-space curriculum can be embedded within other science classes, but the reality is students move between school districts in California and if different course maps are followed, how will that students learn what they need to? I also submit to you a student who only completes two years of high school science will not spend sufficient time with the material to master all of the DCI, particularly those of of the physical science realm.

Thank you for taking the time to read through my responses to the implementation plan for NGSS in California.

Appreciatively,
Jennifer McCluan

Jennifer H. McCluan
San Dieguito Academy Science Teacher
SDUHSD Teacher on Special Assignment-Science
760.753.1121 ex. 5316
http://teachers.sduhsd.net/jmccluan

Comment #90

From: Deborah Mendonca [mailto:dmendonca@templetonusd.org]
Sent: Sunday, August 24, 2014 5:02 PM
To: NGSS
Subject: Middle School NGSS and NGSS Assessment

Dear Tom Torlakson (yes, I would like this forwarded to him and the SEP panel, if possible)

I am a middle school science teacher that has been very unhappy about the decisions made to change middle school from the national NGSS model.

First let me say that the last 2 years has been difficult for interested teachers to learn about, discuss, and respond to NGSS calls to participate in the review of the final product. Often, very little notice was given and times were inconsistent with a working teacher's schedule (Webinar on a Wednesday from 3-4:00... if the bell rings at 3?). Right before school starts in the fall, during the testing window in May, and at the end of the year are NOT the times to expect teachers to find and notice opportunities to be heard. We are in our classrooms working with the next generation of science students.

Second, middle school teachers, like myself, are NOT necessarily against integrating science. I am against what you are CALLING integration. National NGSS makes a case for the Cross Cutting Concepts being part of all science and has written the ways to consider these concepts across every grade from K-12. Somehow, the SEP Panel was able to justify using these concepts as dividers between grade levels, and call it integration. You apparently were even able to convince Art Sussman that it was integration.

At our school district, middle school science teachers have chosen to use the discipline specific model, while filling in (as a truly integrated model should) the specific areas needed so that a single discipline doesn't stand alone. We are beginning to change what we can THIS YEAR and are planning a 3-phase model of implementation. We are integrating appropriately as we plan and articulate across grades 6-8. For example in earth science energy and heat has to be part of both 6th grade weather and plate tectonics/earthquake curricula. The 8th grade will have to pick energy back up to teach forces and motion curricula. Ecosystems can't stand alone as life science, because there are abiotic, as well as biotic factors to consider. Photosynthesis in ecosystems also needs some chemistry background knowledge.

Middle school teachers are the true experts. I, for one, always use an integrated format in my class that also brings in history and math, along with the other science disciplines as much as possible.

Please rethink your rational, try to see that the SEP's failure is in using the Cross Cutting Concepts as dividers, and commit to having an open mind as you read the comments I have added to the following excerpt from the CDE's October 2013 webinar. My comments are added in RED:

Your CA 'Pros of Two Choices'

Discipline Specific
• Teacher Content
Expertise
• Teacher Passion (come on, teachers are capable of moving grades)
• Possibility of 8th grade
integrated assessment that covers 6-8 (as history has done in the past)
Integration

• NGSS vision for
science not silos (National NGSS does not use the CA recommended plan)
• Implementation of
Cross Cutting
Concepts (all grades K-12 use ALL Cross Cutting Concepts...middle schoolers are smart enough to do the same)
• Possibility of 8th grade
integrated assessment (see above)
• Articulated Learning
progression with LEPE each year (besides not finding LEPE on the CDE website, articulation in K-5 and 9-12 doesn't seem to have these constraints)
• SEP recommendation (really? everyone agreed?)

Thank you for your time; I would love a response.

Respectfully,
*D*eborah Mendonca
Science Teacher
Templeton Middle School, TUSD
dmendonca@templetonusd.org
925 Old County Road Templeton, CA 93465
(805) 704-8630

Comment #91

From: Susan Gomez Zwiep [mailto:Susan.GomezZwiep@csulb.edu]
Sent: Sunday, August 24, 2014 5:24 PM
To: NGSS
Subject: Comments on NGSS Implementation Plan

Ca State Board of Education,

I would like to add my support to the state NGSS Implementation plan. I dedicated an afternoon to reviewing the NGSS Implementation plan and each strategy. While I had a few areas that I might have tweaked, overall I found the plan to be reasonable, logical and appropriate for our state, its teachers and students. Here are a few areas that I was particularly excited about in the plan:
1. The plan emphasizes the importance of science K-12 for all students. CA NGSS has the potential to elevate the level of success for all students due to its focus on big ideas and application to real world settings. However, this requires articulation of various stakeholders and teachers across K-12. The plan acknowledges this and has appropriate steps to ensure its success.
2. The plan includes roles for the major partners in K12 Science Education: school districts, CDE, professional development providers (like CA Science Project) and

IHE's. These are the players who impact K-12 Science Education in our state and I applaud the acknowledgement and use of each entity in the plan.
3. The structure of the plan (awareness, transition and implementation) is logical and allows clear stepping points for each strategy.

We have lived under the old Science Standards for such a longtime that there is an entire generation of young teachers who were students under the old standards and have never taught anything else. More veteran teaches will also need to support to implement these new standards with fidelity and integrated with CCSS. A great deal of support and professional development is going to be necessary to implement these standards. This plan acknowledges and prepares for this. I fully support the CA NGSS Implementation plan.

Thank you

Susan
Susan Gomez Zwiep
Associate Professor
Science Education, CSU Long Beach
Susan.GomezZwiep@@csulb.edu

Comment #92

From: David Harris [mailto:dharris@eusd.org]
Sent: Sunday, August 24, 2014 5:33 PM
To: NGSS
Subject: CA NGSS Implementation Plan

This email is to add my support to the CA NGSS Implementation plan. I have reviewed the plan and found it to be well thought out and matches what our district and teachers need to implement the new CA NGSS. I appreciated the use of local PD providers to help provide the support my teachers will need to learn and implement the new standards as well as the inclusion of preservice teachers in the plan. We will be hiring a number of new teachers each year and we want them to be prepared to teach NGSS when we do.

Thank you
David Harris

David Harris
Project Director
Escondido STEM Initiative (ESI)
Escondido Union School District

Comment #93

From: Jill Grace [mailto:gracejill@mac.com]
Sent: Sunday, August 24, 2014 6:04 PM
To: NGSS
Cc: California Science Teachers Association
Subject: Input on the Next Generation Science Standards Systems Implementation Plan for California

Date: August 24, 2014

To: California Department of Education

From: Jill Grace (Science teacher, Palos Verdes Intermediate, PVPUSD)

RE: Public comment on Next Generation Science Standards Systems Implementation Plan for California

I would first like to thank the CDE and the Science Leadership Team for the development of the draft Next Generation Science Standards Systems Implementation Plan for California. I would like to stress that it must be a priority to provide adequate resources at all levels of the plan, from the CDE to the local support providers, for the roll out of NGSS to be successful. Teachers will need a tremendous amount of professional development support both with respect to acquisition of content as well as pedagogical shifts that NGSS will require. This support will be needed from TK through grade 12 as well as teacher preparation programs at the college level. I would also like to emphasize the need to provide extra support to our elementary school colleagues, as the success of NGSS will lie with quality student exposure at a young age. It should be emphasized that in addition to teacher professional development, administrator training along with parent support and communication are also essential for NGSS to be successful and should be a major emphasis in the plan. NGSS must be a high priority for the State of California. Science is a vehicle to support the important changes called for in Common Core, thereby supporting the math and literacy development of students. The world and job market are rapidly changing with scientific and technological innovations are at the forefront of economic growth. It is therefore essential that California invest in science education. I urge you to take the time to ensure that the implementation plan reflects all of this.

Comment #94

From: Valerie Joyner [mailto:vajoyner3@gmail.com]
Sent: Sunday, August 24, 2014 7:17 PM
To: NGSS
Subject: NGSS Implementation Plan - Emphasis on Primary and Intermediate Grades

To Who It May Concern:

I am thrilled that California has adopted NGSS and is planning for it's successful roll out! I believe that these plans will be the key to its success and our future as a scientifically literate society and world citizenry.

I have vast experience with NGSS and realize it's complexities. It will require teachers to learn a new way of thinking, teaching, and doing science in their classroom. This is especially true for the primary and intermediate grade teachers, who do not have the in-depth science background or practice that their middle and high school colleagues have. I therefore will speak to the needs or elementary science education.

1. The most critical aspect of NGSS roll out for California's primary and intermediate teachers will be to have on-going intensive professional development starting long before implementation is expected in the classroom. Elementary teachers will need a thorough understanding of the NGSS document and all of its over-arching components: Disciplinary Core Ideas, Practices, Crosscutting Concepts, Performance Expectations, Evidence Statements, and the like. Each one of these topics, along with new instructional practices and strategies, is a course in and of itself, not merely a 1 hour workshop. These components and strategies are not easily understood or simple to bring into application in their classrooms.

2. This on-going and intensive professional development will be costly. It is therefore extremely important that significant money be allocated to insure that all elementary teachers be given all necessary training in a timely manner.

3. Along with professional development comes the need for quality NGSS aligned curriculum. Gone are the days when students will be studying science by topic, now Disciplinary Core Ideas. California must dictate to curriculum developers that all NGSS components be incorporated into all science curriculum and be assured that all California students will leave each grade level with the ability to apply the science information, practices, crosscutting concepts, engineering tasks, and the like, they have learned. Students must leave each grade level thinking and acting like scientists, that is the power of NGSS and a successful implementation plan.

4. Science instruction must be moved to the forefront of all student curriculum. It can no longer be thought of as an add-on, if a teacher has time for it. We are educating students to be 21st century thinkers and workers, whose jobs and lives will be depend on being scientifically literate every single day. Science must be taught to every student, every day, every year, starting from the first day of kindergarten!

5. It is also imperative that parents, business, industry, and community members understand NGSS and its associated learning opportunities for today's students. I am often surprised to find today, that many members of the general public do not know about, and/or understand NGSS. There is a need for increased public awareness and relations.

California must take the lead with the Next Generation Science Standards and provide all of the necessary time, resources, and materials necessary to assure that every teacher in California is well prepared and committed to everyday science instruction. This will not be an overnight process, but rather a decades long commitment. A commitment that will benefit the entire state of California.

Sincerely,

Valerie Joyner, M.A. Science Education
Retired Elementary Teacher
Elementary Science Education Consultant

707-778-9196
vajoyner3@gmail.com

501 8th St.
Petaluma, CA
94952-4929

Comment #95

From: Christine Bouma [mailto:ccbouma@gmail.com]
Sent: Sunday, August 24, 2014 7:44 PM
To: NGSS
Subject: NGSS must move forward now

To whom it may concern,

We have turned a generation off to science, and it is time to turn it around.

I am writing in overwhelming support of advancing the NGSS in every way possible now.

I am a fifth grade teacher, as well as a parent of a fifth grader.

I cannot tell you how may children I have taught over the last 20 years who have begun the year saying things like, “I’m not good at science,” and “Science is boring,” due to memorization- based curriculum, testing, and lack of teacher training.

I urge you to do anything and everything we can to move the NGSS forward before we lose even more of our workforce and innovators to boredom and lack of forward-thinking practices: actually DOING science instead of learning ABOUT it.

Sadly, on my campus, who was hailed as “Number One in Orange County” last year, students leave our “number one” school scientifically illiterate; the teachers talk about science when time allows, an average of 15 minutes a week.

Teachers desperately need training. Coming from a Liberal Arts background, the majority of elementary teachers lack science contextual understanding.

The next generation of scientists are here; please open the gates for them.

Sincerely,

Christine Bouma

Weaver Elementary

Christine Bouma
Weaver Elementary
Please consider supporting my students:
http://www.donorschoose.org/christine.bouma

Comment #96

From: Heidi Kwalk [mailto:mrskwalk@gmail.com]
Sent: Sunday, August 24, 2014 8:09 PM
To: NGSS
Subject: NGSS Implementation Plan

To whom it may concern:

I am writing to ask for help as an elementary school teacher.
I love to see my students' eyes light up when they know we are doing science.
I take many hours reading online and other resources to make sure I have enough science knowledge to facilitate our science lessons and labs.

It would be heaven sent to be able to get training in science content and teaching.
It is so easy to turn kids off science when all we are doing is reading about science concepts in textbooks.
And when kids are turned off about something at an early age, they tend to stay turned off.

Please help me and my colleagues help students love science.

Heidi M. Kwalk
5th Grade Teacher

Weaver Elementary School
Los Alamitos USD, CA

Comment #97

From: George Berg [mailto:berg_george@hotmail.com]
Sent: Sunday, August 24, 2014 11:43 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

I am opposed to adopting inferior standards.

The Fordham institute gave NGSS a C rating.

California's current science standards were one of only 2 in the nation to receive an A rating from Fordham.

http://tinyurl.com/7cfas22

George Berg

Comment #98

From: Michele Z [mailto:faith96386@yahoo.com]
Sent: Monday, August 25, 2014 1:20 AM
To: NGSS
Subject: Next Generation Science Standards

I am aware of the connection between NGSS & Common Core. I am not fooled by NGSS' repeated claim of being "state-led", and I am opposed to the involvement of Achieve, Inc. and WestEd.

According to Fordham Institute, California's previous science standard were rated "A" and NGSS are rated "C". Why in the world are we adopted INFERIOR standards?!

Michele Zollars
3227 Camellia St.
Anderson, CA 96007

Comment #99

From: Nicole Alvarez [mailto:dirtfinder@gmail.com]
Sent: Monday, August 25, 2014 6:33 AM

To: NGSS
Subject: Feedback for Next Generation Science Standards

The Fordham Institute has issued a C rating for the Next Generation Science Standards. California's existing standards were one of 12 states to receive an A rating. Adopting these standards would lower our standards and further dumb down the education of the students.
http://edexcellence.net/publications/final-evaluation-of-NGSS.html

Sincerely,

Nicole Alvarez
California resident and parent

Comment #100

From: William Layton [mailto:layton@physics.ucla.edu]
Sent: Monday, August 25, 2014 7:24 AM
To: NGSS
Subject: Coments on the introduction of the NGSS in California

It was a sad day for me when California adopted the NGSS and decided to drop the excellent California Science Standards.

The NGSS Framework has so many words that I doubt that most, if not all teachers, will ever have time to read them. The people who prepared this framework must feel that different colors will somehow make the document more useful--they do not. I feel that the people who drafted this document just don't get it! (I have been told that the document was not intended for teachers. I certainly hope there are plans to write things that are inteded for teachers and these documents will make more sense and use fewer words.) I communicate with new science teachers frequently and have yet to find one who supports the NGSS approach to physics.

My interest is high school physics. The physics appropriate for high school in the NGSS Framework is vastly inadequate, even for "All Students." The 8th grade standards in the old California Science Standads are better even if your interest is in the physics education of all students. All students need many basic physics concepts that are not even mentioned in the NGSS.

This is not the first time I have expressed the above opinions to the cde. However, I guess the die has been cast and I fear for physics education in the years to come in California.

Sure, your latest call (due today) was for suggestions on how to introduce the NGSS. How can I encourage the introduction of such an unsatisfactory program?

Bill Layton Retired Physics Teacher

Comment #101

From: Joseph Arias [mailto:drjosepharias@gmail.com]
Sent: Monday, August 25, 2014 7:53 AM
To: NGSS
Subject:

To whom it may concern,

We have turned a generation off to science, and it is time to turn it around.

I am writing in overwhelming support of advancing the NGSS in every way possible now.

I am a fifth grade teacher as well as a mentor to many new teachers.

Our grade level team has noted many children we have taught over the last 20 years who have begun the year saying things like, “I’m not good at science,” and “Science is boring,” due to memorization- based curriculum, testing, and lack of teacher training.

I urge you to do anything and everything we can to move the NGSS forward before we lose even more of our workforce and innovators to boredom and lack of forward-thinking practices: actually DOING science instead of learning ABOUT it.

Sadly, on my campus, who was hailed as “Number One in Orange County” last year, students leave our “number one” school scientifically illiterate; the teachers talk about science when time allows, an average of 15 minutes a week.

Teachers desperately need training. Coming from a Liberal Arts background, the majority of elementary teachers lack science contextual understanding.
The next generation of scientists are here; please open the gates for them.
Sincerely,
Dr. Joseph Arias
Weaver Elementary

Comment #102

From: Whisman Don [mailto:dwhisman@sandi.net]
Sent: Monday, August 25, 2014 9:46 AM
To: NGSS
Subject: NGSS Systems Implementation Plan Suggestions

Hello CDE staff,
Here are a few comments/ suggestions for the NGSS Implementation Plan:

* Overall use the PEM format with the 8 guiding strategies is effective.
* Strategy 2- Emphasize time for science K-12, especially for grades K-6 (page 32). Suggestions of how to integrate NGSS with CCSS effectively would be a great tool for all teachers, especially elementary teachers who are strapped for time to fit science in.
* Strategy 3- Stress the need for both formative and summative assessment tools that reflect all 3 dimensions of the performance expectations making sure to include the practices with the DCIs.
* Strategy 5- In discussing Postsecondary Communities a component addressing teacher preparation should be added. This plan should address developing coursework/ professional learning for aspiring teachers of science (including all elementary teachers) to promote their understanding of NGSS and develop their ability to effectively implement NGSS and its 3 dimensions to provide access and quality instruction for all students. This may also be included in Strategy 1.

Thanks for your consideration, efforts, and support!

Don Whisman
Science Program Manager
Teaching and Learning
San Diego Unified School District
4100 Normal Street, Room 2116
San Diego, CA 92103
Office: (619) 725-7345
Fax: (619) 725-7242

Comment #103

From: Tanya Clifton [mailto:tanyaclifton@mac.com]
Sent: Monday, August 25, 2014 10:59 AM
To: NGSS
Subject: Public Comment NGSS

I am opposed to adopting inferior standards. California's current science standards were one of two states in the nation to receive an "A" grade from Fordham Institute. Next Generation Science Standards has received a "C" grade from Fordham. The State of The State Science standards http://tinyurl.com/7cfas22
Please reconsider.
Sincerely,
Tanya Clifton, San Marcos, CA

Comment #104

From: Gregory Bostrom [mailto:bostrom@lvusd.org]
Sent: Monday, August 25, 2014 11:36 AM
To: NGSS
Subject: NGSS Adoption

As a science teacher for nearly thirty years, it is exciting to see some of the changes that will be brought about with the Next Generation Science Standards. The emphasis on real world applications help make science relevant for my students. It is however, a little disheartening to see less emphasis placed on human body systems and health-related topics in the middle school level. Middle school adolescents are experiencing the onset of puberty and must understand the impact their behaviors have on their body systems and general health. Nearly all of the causes of premature death in this country can be attributed to lifestyle diseases. Evidence has shown that the onset of these disease begins in the teen years. Cardiovascular disease, osteoporosis, respiratory illness, lung cancer, emphysema, nutritional deficiencies, many neurological disorders, communicable, and sexually transmitted diseases are all good examples. Without a solid educational background in these areas, our students are much more likely to acquire a disease that could have been prevented. At this time it appears that the NGSS has either eliminated much of this topic or has placed much less emphasis upon them. There is some hope as the Alternate Discipline Specific Model proposed in California does appear to maintain instruction in these critical topics. This model meets the requirements for NGSS and allows our children to learn the skills to maintain a healthy lifestyle. Please provide states more options such as the discipline specific model to better meet the needs of our students.

Thank you,
Greg Bostrom

Comment #105

From: Jonathan Osborne [mailto:osbornej@stanford.edu]
Sent: Monday, August 25, 2014 12:41 PM
To: NGSS
Cc: Darling-Hammond, Linda; Pecheone, Raymond L.; Schultz, Susan Elise; Quinn, Helen R.; Trish Williams; Rich Shavelson
Subject: Submission on Draft Plan

Dear Sir/Madam

Attached is a response to the draft plan for implementation of the Next Generation Science Standards Implementation Plan for California. We would be happy to discuss this further if you have any questions.

Sincerely,

Jonathan Osborne
Shriram Family Professorship of Science Education
Graduate School of Education
Stanford University
485 Lasuen Mall
California 94305
USA
Tel: 650 725 1247

Comment on the Draft Plan for the Implementation of NGSS in California

Jonathan Osborne
Ray Pecheone
Helen Quinn
Susan Schultz
Linda Darling Hammond
Richard Shavelson

Graduate School of Education, Stanford University

In commenting on the draft plan for the implementation of the next generation science standards in California, we have chosen to restrict our comment to section 3 on Assessment. This is not because we do not view the other elements as important. They are. Rather, any teaching and learning experience is a product of three factors – pedagogy, curriculum ***and*** assessment. In looking at the plan, we feel that the role and importance of assessment is a critical factor to achieving the successful implementation of NGSS in California. However, this role is underemphasized and undervalued in the draft plan.

California's adoption of the Next Generation Science Standards (NGSS) provides a significant opportunity to improve the quality of California science and engineering education. The new standards — with their emphasis on both what we know and how we know — have the potential to offer an education in science and engineering that is rigorous, challenging and engaging for young people. Creating effective learning experiences, however, requires assessment that is aligned with learning goals, curriculum and instructional practices. Indeed, evidence suggests that teachers understand the intentions of the curriculum not from the standards but from the exemplar items and tasks developed to support assessment(Au, 2007; Hannaway & Hamilton, 2008; Stecher & Barron, 2001) – particularly in an era when the outcomes of assessment are 'high stakes'. Thus, quality assessments are a fundamental conduit for communicating the changes demanded in curriculum and instruction. Consequently, the success of NGSS will be critically dependent on the production of high-quality exemplar tasks and items that communicate the intent and meaning of the NGSS framework.

Indeed, the experts responsible for the National Research Council (NRC) report on assessing the NGSS argued that:

> Achieving the goals of the framework and NGSS will require an approach in which classroom assessment receives precedence. This change means focusing resources on the development and validation of high-quality materials to use as part of classroom teaching, learning, and assessment, complemented with a focus on developing the capacity of teachers to integrate assessments into instruction and to interpret the results to guide their teaching decisions. (Pellegrino, Wilson, Koenig, & Beatty, 2013)(p. 6-7)

The basic principle of the NRC report is that measuring the performance expectations described in the NGSS will require assessments that are significantly different from those in current use. The NRC proposed that an assessment system should be composed of assessments designed both to support classroom teaching and learning, and to meet the need for formative and summative assessments. Such assessments require tasks which assess not just content knowledge but also student competency with specific scientific practices and their understanding of the cross cutting themes in science. That is, any task must transcend just the assessment of content which, to date, has been the overwhelming focus of the California tests. In addition, the competencies assessed by NGSS will require items that go beyond simple multiple choice to use items and tasks which assess, for instance, students' ability to develop and evaluate evidence to test a hypothesis, analyze an argument from evidence, carry out and manipulate and control variables in an experiment, critique representations, link one idea to another and construct explanations. This will require new and innovative modes of assessment. Hence, it is not just a case of tweaking existing assessments or reproducing items/tasks that were developed off of existing test specifications or blueprints.

We do not feel that the draft plan has adequately recognized the nature of the challenge and the investment that must be made in assessment. For instance, the plan places great emphasis on the development of formative assessment tools and training teachers to use such items. We fully support formative assessment and welcome the view that many of the tools will be digital as only such tools can provide the rapid and timely feedback to the teacher which is such a key factor in improving the quality of instruction (Hattie, 2008). As Hattie argues "When teachers seek, or at least are open to, feedback from students as to what students know, what they understand, where they make errors, when they have misconceptions, when they are not engaged—then teaching and learning can be synchronized and powerful. Feedback to teachers helps make learning visible."

However, we do not think that digital tools can do all that is necessary to assess students' performance of the 8 scientific practices which are a key feature of the NGSS. There need also to be hands-on tasks that assess students' ability to conduct

investigations, organize and evaluate data, and explain what the data mean. Tasks must assess students' ability to communicate and engage in evidence-based argument in science. To the best of our knowledge and expertise, such tasks that support and assess these skills are rare, especially in a digital form.

Thus we feel that report has underestimated considerably the nature of the challenge to "identify and develop sample digital CA NGSS formative assessments, tools including samples of student work, performance task scoring rubrics, and other resources" (p. 35). And without a set or sample of high-quality items, it is unlikely that the professional development for formative assessment will have sufficient value.

However, it is summative assessment that is a central concern to us as the outcomes of the implementation will be greatly dependent on the nature of the items and tasks that are used for summative assessment. Not only teachers but also parents will read the intentions of the curriculum from such items. There are two major points that we would wish to make.

First, all research evidence points to the fact that short, summative tests have poor test-retest reliability and limited validity (Black & Wiliam, 2005). Essentially that means that making judgments about student and teacher performance on the basis of such tests is questionable. More reliable assessments with better validity depend on a portfolio of tasks, some of which are extended and some of which require teacher assessment. To those who would argue that teachers can not be trusted to assess their own student performance – that is employ embedded assessments for summative purposes--we would point to Canada, Singapore, Hong Kong, and Australia, as well as the International Baccalaureate program, where such systems of assessment have been used for many years. Teachers undertake a process of group moderation to ensure that any of their assessments are appropriately judged (Butler, 1995).

Second, the summative assessments that are needed to test the NGSS need to go well beyond what currently exists; items will be different and the "sit down" component of the test will also need to be computer based. To date, assessments in science have relied on multiple-choice items which predominantly make only low-level cognitive demands of recall and comprehension of domain-specific content knowledge. Not only does the NGSS require students to engage in higher order cognitive tasks of analysis, critique and evaluation, it also requires tests to assess knowledge of procedures and their epistemic justification, and of student ability to *undertake a set of 8 scientific practices*. To our knowledge, only the more recent PISA and NAEP tests have begun to test such knowledge. Tests of this nature cannot be produced overnight and will require extensive work and support of test developers and researchers. Work needs to begin now on developing models of what such assessments might be and how they might be implemented with the longer-term goal of achieving an improved test in 3 years time.

This "on demand" portion of the test will need to be augmented with classroom-based performance assessments that measure students' abilities to design, conduct, observe, analyze, and communicate about inquiries if the NGSS are to be assessed.

It is our view, that the plan needs to give much more emphasis to the crucial role of assessment in implementing any new curriculum framework, the resource and time that needs to be devoted to its attainment, and the nature of the challenge that the new curriculum framework poses for assessment development.

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Brief Bios

Jonathan Osborne (PI) is a professor in the School of Education at Stanford University and was a member of the National Academies Panel responsible for drafting the framework leading on writing the chapter on Science Practices. He is also the chair of the Science Expert group responsible for drafting the framework for the OECD PISA science assessment in 2015 and working with ETS to evaluate the items they are generating for this assessment. Over the past 4 years he has worked closely with Dr. Mark Wilson from UCB developing assessments of argumentation in science.

Ray Pecheone is Professor of Practice at Stanford University and the Executive Director of the Stanford Center for Assessment Learning and Equity (SCALE), which focuses on the design and development of the next generation of formative and summative student and teacher assessments. He was previously the Research and Assessment Director for the Connecticut State Department of Education which was a leader in developing inquiry-based science assessments for large-scale use.

Susan Schultz is the Director of Teaching, Learning, and Assessment at SCALE. She has extensive experience designing science performance assessments for large-scale implementation in California, Ohio, and New York City and is currently designing math

performance assessments for the Smarter Balance Assessment Consortium. She developed the Quality Science Teaching (QST) observation instrument used in the Measures of Effective Teaching (MET) project funded by the Gate Foundation and recently received an NSF grant to modify the QST to be used as a formative tool with elementary teachers.

Helen Quinn is a leading physicist who chaired the committee that produced "A Conceptual Framework for K-12 Science Education," which served as the basis for NGSS and is a member of the NRC panel that produced the NRC report on Assessment for the NGSS. She is also the chair of the committee developing the California Framework

Linda Darling-Hammond who is Professor at Stanford University's School of Education and faculty director of the Stanford Center for Opportunity Policy in Education. She has been involved in research and development of performance assessments for students and teachers in a number of states and helped to launch the Smarter Balanced Assessment Consortium, for which she serves on the Technical Advisory Committee and the Executive Committee.

Richard J. Shavelson is chief scientist and Partner at SK Partners, LLC and the Emeritus Margaret Jacks Professor of Education and I. James Quillen Dean Emeritus of Stanford's Graduate School of Education; he is also Professor of Psychology and Senior Fellow Emeritus in the Woods Institute for the Environment. He served as president of the American Educational Research Association; is a fellow of AAAS, AERA, APA, APS and a Humboldt Fellow (Germany). He is member of the National Academy of Education and the International Academy of Education. His current work includes assessment of undergraduates' learning including the Collegiate Learning Assessment, assessment of science achievement, and validity of learning progressions. His publications include *Statistical Reasoning for the Behavioral Sciences*, *Generalizability Theory: A Primer* (with Noreen Webb); *Scientific Research in Education* (edited with Lisa Towne); and *Assessing College Learning Responsibly: Accountability in a New Era*.

Comment #106

From: Bradley Schleder [mailto:schleder-b@kcusd.com]
Sent: Monday, August 25, 2014 12:48 PM
To: NGSS
Subject: NGSS Implementation Plan

I believe that California's draft NGSS implementation plan will take us in the right direction for science education. We need a huge overhaul of our current science teaching practices. This will take professional learning opportunities, new instructional practices and, most importantly, science for EVERY student, every day, and at every grade level. These issues and more are addressed in this well crafted plan.

I wholeheartedly support this draft and look forward to its implementation.

Best regards,

Bradley Schleder
Science Project Director

A California Math and Science Partnership Project
and
California NGSS K-8 Early Implementaiton Initiative
A WestEd Project
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Website

Comment #107

From: Herbert Brunkhorst [mailto:HkBrunkh@csusb.edu]
Sent: Monday, August 25, 2014 1:31 PM
To: NGSS
Cc: Bonnie Brunkhorst
Subject: CA NGSS Implementation plan

Comments re: Successful NGSS Implementation plan:

1. Daily science instruction , K-12 is essential (Time to teach science every day)
2. Resources for teaching science (materials of science for learning science (can't learn science without the materials of science. Direct experiences, just as you can't learn to swim without a swimming pool.)
3. Professional development identified by the teachers of science. Time for professional development, Funding for NGSS professional development at science teaching conferences.
4. Required Earth Sciences courses and testing at 9th grade.

Submitted by,
Bonnie J. Brunkhorst, Ph.D.
California State University, San Bernardino

Comment #108

From: Robert W. Lucas [mailto:bob.lucas@calobby.com]
Sent: Friday, August 22, 2014 3:54 PM
To: NGSS
Subject: Comments re Next Generation Science Standards Systems Implementation Plan for California

Attached are comments on behalf of Business for Science, Mathematics and Related Technology Education (BSMARTE). If you have any questions, please do not hesitate to contact me. Thank you for the opportunity to comment.

Bob Lucas
Lucas Advocates
1107 9th Street, Suite 540
Sacramento, CA 95814
Bob.lucas@calobby.com

Formal Letter from Bsmarte

Date: August 22, 2014

The Honorable Tom Torlakson
State Superintendent of Public
Instruction California
Department of Education
1430 N Street
Sacramento, CA 95814

Re: Support of the Next Generation Science Standards Systems Implementation Plan for California

Dear Superintendent Torlakson:

On behalf of Business for Science, Mathematics and Related Technology Education (BSMARTE), a non- profit organization comprised of educators and businesses committed to promoting high-quality math and science education in California's education system, I write in support of the California Next Generation

Science Standards Implementation Plan (CaNGSS Implementation Plan). Upon careful review of this watershed plan, we find many positive elements. The challenge will be implementation.
As we look to projections for the future workforce we know:

•!• During the next decade, the United States demand for scientists and engineers is expected to increase at four times the rate for all other occupations. (STEM Workforce Data Project: Report No. 7)
•!• Forty-five percent of today's current science and engineering workforce will retire within the next few years, creating an even stronger demand for a Science Technology Engineering Math (STEM) workforce. (High Stakes STEM Education, :::::; 2008)
•!• Scientific innovation has produced roughly half of all US economic growth in the last 50 years (National Science Foundation 2004)
•!• STEM workers earned about 70% more than the national average for all occupations in 2005. In 2010, 16 out of25 of the highest paying jobs required STEM preparation. (Bureau of Labor Statistics, 2008)
•!• In five years, California, Texas, New York, Florida and Illinois will be the leaders in creating the most STEM jobs. (Bureau ofLabor Statistics)

After many years of operation under our current science standards the transition to CaNGSS requires that all participants in our state educational system significantly "retool." The degree to which CaNGSS necessitates new thinking, new systems and new practices at all levels in our educational system must not be underestimated. The transition to CaNGSS *is* the shift to 21st Century learning that we have spoken of for so long, emphasizing the critical-thinking and problem-solving skills mandated by a technological society. CaNGSS will require professional learning, new instructional strategies and practices, courage to teach in a manner that expects high levels of student engagement, adjustments by students to new teacher expectations, science for every student, every day, and every grade, and management ofthe hopes and fears of parents. CaNGSS is a "game changer."

The California Board of Education, California Department of Education, County Offices of Education, districts across the state, and professional organizations have initiated the retooling process as we turn our attention to California's Next Generation of Science Standards. Our State Board of Education has begun the process of revising the *Science Framework* through the Instructional Quality Commission (IQC) that will ultimately lead to the adoption of new and better NGSS-aligned instructional materials. The CaliforniaN ext Generation Science Standards (CaNGSS) Implementation Plan identifies eight (8) Guiding Strategies.

We believe a commitment -both fiscal and programmatic- to these Guiding Strategies is critical in the implementation ofCaNGSS. We suggest, additionally, why these Guiding Strategies must be addressed and implemented at a high level.

1. Facilitate high quality professional learning opportunities for educators to

ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CaNGSS.

2. Provide CaNGSS aligned instructional resources designed to meet the diverse needs of all students.
    a. The days of relying on hard copy direct instruction textbook programs are over with the constant innovation and access to information and use of hands-on instructional techniques.
    b. We need to provide guides for determining quality and accuracy of information.
    c. We need to consider access to real world professionals in the field, experts who can be accessed remotely thru a variety of technological tools and be "speakers" to students while they are in the midst of their learning.
    d. We need to consider the contributions students can make to science as they apply their learning and discoveries in this content area.

3. Develop and transition to CaNGSS-aligned assessment systems to inform instruction, establish priorities for professional learning, and provide tools for accountability.

4. Collaborate with parents, guardians, and the early childhood and expanded learning communities to integrate the CaNGSS into programs and activities beyond the K-12 school setting.

5. Collaborate with the postsecondary and business communities and additional stakeholders to ensure that all students are prepared for success in career and college.

6. Seek, create, and disseminate resources to support stakeholders as the CaNGSS systems implementation moves forward. The Milk Industry says, "Milk is good for every body." We believe that a well-educated population with regard to science is good for every body and no expense or effort should be spared to communicate the ultimate win for our fellow Californians.

7. Design and establish systems of effective communication among stakeholders to continuously identify areas of need and to disseminate information.

8. Build coalitions to ensure a common message and to sustain momentum during implementation. However, the time has come for California to invest in a world-class education. This investment is larger than a plan for implementation. It is larger than well-crafted statements expressing a vision. If we are to commit to helping our students develop a skill set for the future, then we must not only develop a well crafted plan; we must commit time, effort and most importantly the resources that will fund the

implementation that leads to the success of our students.
Thank you. If you want to discuss this matter further or have any questions, please contact me at 916-444-7337.

Sincerely,
/s/
Robert W. Lucas
Executive Director

cc: The Honorable Edmund G. Brown, Jr., Governor, State of California
President and Members of the State Board of Education
Members of the Instructional Quality Commission
The Honorable Darrel Steinberg
President Pro Tempore, California State Senate
The Honorable Toni G. Atkins, Speaker, California State Assembly
The Honorable Mark Leno, Chair
Joint Legislative Budget and Senator Committee on Budget & Fiscal Review
The Honorable Carol Liu, Chair, Senate Education Committee
The Honorable Nancy Skinner, Chair, Assembly Committee on Budget
The Honorable Joan Buchanan, Chair, Assembly Committee on Education
Mr. Tom Adams, Executive Director, Instructional Quality Commission
Mr. Michael Cohen, Finance Director, Department of Finance

Comment #109

From: Larry Flammer [mailto:flammer4@gmail.com]
Sent: Saturday, August 23, 2014 1:36 PM
To: NGSS; Jessica Lewis; CSTA Administration
Subject: Critique of NOS in NGSS

NGSS for CA Staff,

I am a retired biology teacher, and have been focusing specifically on the nature of science (NOS) elements as they are expressed in the NGSS. Much of the science illiteracy in our country can be traced directly to the many misconceptions about science, its realm, its limits, its benefits and its different processes. And most of those errors can be traced to **science textbooks** at all levels that have persisted over many decades in perpetrating those misconceptions. Of course, many teachers (and their students) base their understanding of science on what they find in those textbooks.

Finally, with the NGSS, and with the new forthcoming *California Framework*, we have an exceptional opportunity to correct this problem. I'd like to share my deep involvement with teaching NOS with those who are developing the new standards and framework for California. I have communicated my concerns about many of the specifics to the national effort as the national Framework and standards has developed. Some points

were incorporated, but many were not. So, the California standards and framework is our last chance to turn the problem around.

I am attaching a two-page listing of some of my deepest concerns. I hope and trust that you and your colleagues will do all you can to make the suggested changes. Remember, once the **book publishers** get hold of those anemic but critical aspects of the NGSS NOS as they stand, we might as well throw in the towel.

Yours respectfully,
Larry Flammer
Larry Flammer
Webmaster, ENSIweb
San Jose, CA
408-268-3657
flammer4@gmail.com
Science Surprises: Exploring the Nature of Science

Where is the Nature of Science in the NGSS?

by Larry Flammer August 23, 2014
flammer4@gmail.com

Unfortunately, many elements of the **nature of science** were omitted or were too weak in the NGSS Core Idea pages and the NGSS Appendix H, even though many were expressed in the 2012 national *Framework*. Apparently, corrections and additions of these have not found there way into the California version. Ideally, that would be the best solution. But if it's impractical for those additions and changes to be inserted, then they should certainly be given prominent placement and attention in the forthcoming *California Framework*. Here are some of the more egregious issues in the NGSS:

NOS Must be Taught Explicitly

Research clearly shows that students do *not* automatically learn the nature and processes of science by doing hands-on science or authentic, inquiry-oriented investigations. NOS must be taught explicitly. "... learning about the nature of science requires more than engaging in activities and conducting investigations. (NGSS Appendix H, p. 2)."

NOS, as presented in the NGSS (in its **Appendix H**, p. 4) includes a list of eight basic understanding categories about NOS. In fact, you should read *all* of **Appendix H**. In the 2-page tables of **Practices** and **Crosscutting Concepts**), there are 26 Learning Outcomes (LOs) expected for middle school, and 32 LOs expected for high school. Those Learning Outcomes are supposed to be included in the Foundation Boxes of each Core Idea page. However, in a sampling of the Life Science Core Idea pages for middle school and high school, very few of those LOs appear (see table below):

Grade Bands	Life Science Core Idea	NOS Themes	Learning Outcomes	Out of # in NGSS

	pages	Cited (out of 8)	Cited …	Append. H (NOS)
Middle School	4	5	5	26
High School	4	5	7	32

Nothing explicit about NOS is included in the **Assessable Components** (white area of each **Core Idea** page). With so little mention of the NOS elements on the Core Idea pages, teachers (and **textbook authors)** will be unlikely to even notice most (or all of) them, and therefore are not likely to focus on those elements, especially not **explicitly** (as all research findings say they should). Why isn't there at least a Core Idea page dedicated to NOS that is equivalent to the other Core Ideas. NOS should be considered just as important as any other "content" topic, if not more so!

Clear Distinctions Not Made

In order to send the clear message to teachers and **textbook authors**, old and inaccurate concepts and word usages should be clearly pointed out as such, and be replaced by more accurate terms. Unfortunately, the NGSS NOS tables (Appendix H) fail to do this:

1. **Science & Engineering Practices (SEP - blue table**), 4th category: "Scientific Models, Laws Mechanisms and Theories Explain Natural Phenomena." Because of its importance, "Only" should be inserted: "... Theories Explain Only Natural Phenomena." Either there, or elsewhere in the table, absence of supernatural phenomena must be explicitly emphasized, e.g., "... Only Natural Phenomena, Never Supernatural Phenomena, as such." A similar "Only" should also be inserted in the **Crosscutting Concepts (CC - green page**), 4th category: "Science Addresses Only Questions About the Natural and Material World." The public's lack of understanding about this is a major cause of much of their conflict with science (e.g., about evolution, vaccinations).

2. SEP, 4th row, Middle School column, there are several weaknesses there:
   a. Should be: "Scientific theories are well-supported explanations for observable phenomena. They are *not* guesses, conjecture or speculation, as it's used outside science. [And omit the fifth item "e" below].
   b. Should be: "Scientific theories are based on..."
   c. Should be: "Scientific Laws are regularities..."
   d. "A hypothesis is used by scientists..." should be: "A hypothesis is used by scientists as a tentative explanation for an observed phenomenon that can be tested. It is *not* "an educated guess" or a "prediction." Notably, Appendix H makes little mention of "hypothesis," tending to use "model" in its place. Probably a good idea. Nevertheless, the frequent uses in textbooks and by teachers of hypothesis as an educated guess or a prediction in an experiment requires that those inaccurate uses be clearly pointed out to teachers and students (via textbooks).

e. "The term 'theory' as used in science is very different from the common use outside of science." Why not just add this to the first item (a) in this list, and omit item e?

3. SEP, top row, High School column, first item: "Science investigations use diverse methods and do not always use the same set of procedures to obtain data. For example, experiments may work for current events, but not for ancient events, where one can only search for clues that are based on current models (or hypotheses)."

4. Same box, third item, add at the end: ", and their testability."

5. Same page, Middle School column, third box down, replace 2n item with "The uncertainty and durability of science findings varies. There are degrees of uncertainty in scientific explanations."

6. On the **Crosscutting Concepts page (CC, green)**, Middle School column, last category, second item (Learning Outcome), should be: Science limits its explanations to systems that lend themselves to observation and empirical evidence: only natural explanations, never supernatural. [This emphasizes that important point].

7. Same box, fourth item (Learning Outcome) should be added: Science is our most successful and reliable way for understanding the natural world, because it works.

8. Same page, High School column, first box, 3rd item: Add at the end: (including the testing of possible explanations).

9. Same column, third box down, 3rd item: Add at the end: This brings **bias** to science, which is much reduced by using the rules and values of science.

10. Same column, fourth box down, 1st item: Add at the end: "Questions of judgment, opinion, beliefs, and supernatural events, as such, are off limits to science."

Comment #110

From: Obrien, Marianna [mailto:mobrien@smmusd.org]
Sent: Monday, August 25, 2014 3:07 PM
To: NGSS
Subject: NGSS

Robust science education is necessary everyday for every grade.

Marianna O'Brien
Jade Core - 8th Grade Science
310.393.9227 ext. 73506
mrsobrienscience.com

Comment #111

From: Sarah Hunter [mailto:jandshunter@gmail.com]
Sent: Monday, August 25, 2014 3:11 PM
To: NGSS
Subject: Common Core State Standards

I am opposed to changing the standards for our schools, especially since the new standards are inferior to the old ones. Analyzing the information should be secondary to learning the facts. The slip from an A rating by the Fordham Institute to a C is shocking for us parents to stomach.

Please consider Californian's desires and needs before making such dramatic changes.

Sarah Hunter

Comment #112

From: Herbert Brunkhorst [mailto:HkBrunkh@csusb.edu]
Sent: Monday, August 25, 2014 3:16 PM
To: NGSS
Cc: Herbert Brunkhorst
Subject: NGSS Implementation Plan

Comments re: Successful NGSS Implementation plan:

1. Daily science instruction is essential K-12, including every day.
2. Resources for teaching science (materials of science for learning science. Direct experiences require appropriate materials, just as you can't learn to swim without a swimming pool.
3. Professional development to involve and be identified by the teachers of science.
4. Time for professional development, both locally and at science teaching conferences
5. Adequate funding for NGSS professional development

Respectfully submitted,

Herb Brunkhorst, Ph.D.

Professor Emeritus of Biology and Science Education
CSUSB

Comment #113

From: Ehlers, Bryan@CalRecycle [mailto:Bryan.Ehlers@calrecycle.ca.gov]
Sent: Monday, August 25, 2014 3:31 PM
To: NGSS
Subject: Public Comment from CalRecycle on NGSS Draft Implementation Plan

To Whom it May Concern,

The Department of Resources Recycling and Recovery (CalRecycle) hereby submits the attached public comment in response to CDE's proposed NGSS Draft State Implementation Plan. Please feel free to contact me at the above email address or 916-341-6700 with any questions. We will be mailing a hard copy of Director Mortensen's attached letter to those cc'd shortly.

Thank you,

Bryan

Formal Letter from Department of Resources Recycling and Recovery (CalRecycle)
August 25, 2014

The Honorable Tom Torlakson
State Superintendent of Public
Instruction 1430 N Street
Sacramento, CA 95814

Dear Superintendent Torlakson,

Thank you for your long-standing support of science education, and, in particular, for the California Department of Education's (CDE's) collaboration with CalRecycle on the development and implementation of the Education and the Environment Initiative (EEI) Curriculum. A rapidly growing number of teachers and administrators across California are becoming aware of the benefits of environment-based instruction in traditional subject matter and are using the EEI Curriculum to support their Common Core and Next Generation Science Standards (NGSS) implementation.

Thank you also for the opportunity to comment on CDE's draft NGSS implementation plan. Given its emphasis on systems thinking and crosscutting concepts, the NGSS can go a long way toward preparing our students to understand their complex relationship with the natural world, and I believe it has

great potential to help empower them to make wise choices toward a sustainable future. To that end, I urge you to explicitly reference California's approved environmental principles and concepts (EP&Cs) in the final NGSS implementation plan. Public Resources Code Section 71301 required the EP&C's to be developed as part of the creation of the EEI Curriculum, and it mandates their inclusion in future textbook adoptions, including for science. The EP&Cs are already a part of the criteria for the development of the next California Science Curriculum Framework, and teachers will undoubtedly be confronted with teaching them in the very near future (if they are not already voluntarily implementing the EEI Curriculum). Explicitly identifying the EP&Cs as a part of professional learning and instructional materials identified in the NGSS plan would capitalize on the opportunity the new standards present to support a fundamental shift in teaching practices statewide (consistent with statutory intent), and it would help to prevent the confusion that would otherwise ensue when educators are confronted with new NGSS-aligned textbooks that introduce the EP&Cs in a couple of years from now.

Bryan Ehlers of my staff heads our Office of Education and the Environment and is a member of your Environmental Literacy Task Force. Bryan would be happy to work with your staff, at their convenience, to determine the best way to integrate the EP&Cs into the NGSS Implementation Plan. Please feel free to have your staff contact him at bryan.ehlers@calrecycle.ca.gov, or 916-341-6700.

In the meantime, thank you again for your ongoing commitment to environment-based education and the important work our agencies are doing together. I look forward to continued collaboration with CDE, and please do not hesitate to contact me at carol.mortensen@calrecycle.ca.gov regarding the manner in which we can best work together in pursuit of a bright future for education and environmental literacy in California.

Sincerely,

/s/

Caroll Mortensen
Director

cc: Richard Zeiger, Chief Deputy Superintendent of Public Instruction, California Department of Education
Lupita Cortez Alcala, Deputy Superintendent of Public Instruction, California Department of Education
Carrie Roberts, Director, Professional Learning Support Division, California Department of Education
Tom Adams, Director, Curriculum Framework & Instructional Resources Division, California Department of Education
Craig Cheslog, Director, Superintendent's Initiatives Office, California Department of Education Megan Ellis, Coordinator, Superintendent's Initiatives

Office
Elizabeth Babcock, California Academy of Sciences; Co-Chair, Superintendent's Environmental Literacy Task Force
Craig Strang, UC Berkeley, Lawrence Hall of Science; Co-Chair, Superintendent's Environmental Literacy Task Force

Comment #114

From: LISA HEGDAHL [mailto:lhegdahl@galt.k12.ca.us]
Sent: Monday, August 25, 2014 3:40 PM
To: NGSS
Subject: NGSS Implementation Plan for California

August 25, 2014

State Board of Education,

I have read the draft of the State Implementation Plan for California Next Generation Science Standards for Public Schools. There are a few components of the plan that I particularly appreciate:

☐ LEAs, CDE, and Support Providers are named specifically as playing a crucial role in the implementation process.

☐ The plan clearly shows that implementation of the NGSS will take time. As a full-time science teacher, it is comforting to know that I am not expected to implement *today*.

☐ At the Implementation phase, many parts have a statement about evaluating effectiveness, getting feedback, etc.

There a few aspects I would like to see improved:

☐ While many of the plan's components have a statement about evaluating effectiveness, getting feedback, etc., I believe that this is a critical part of all the tasks. For example, in the CDE section under Implementation for Development of Formative Assessment tools, there is no mention of re-evaluating the tools at this juncture to see if they are still in line with the needs of educators and in line with the spirit of NGSS. Much can change from the Awareness Phase to the Implementation Phase in our understanding of the Standards as well as in the understanding of the most affective ways to evaluate the learning. The plan should reflect those inevitable learnings.

☐ As a teacher that relies on strong science education at the younger grades in order for my students to be successful, language in the implementation plan that more

strongly calls for science for every student at every grade level is needed. Simply calling for the teaching of Science at every grade level will not make it happen, however. K-5 teachers will need quality, accessible professional development that will fit in with the demands they are already encountering with Common Core. They will need lesson sequences that are classroom ready and the training to implement them. In addition, the professional development will need to be on-going. NGSS training cannot be one stop shopping. It will take much time and effort to become comfortable with and knowledgeable about the standards and how to teach them.

This is great opportunity for all of us who have an interest in high quality science education to implement the NGSS in a thoughtful, comprehensive way. I appreciate the time and effort that went into the authoring of the document and I am looking forward to seeing the shifts away from the old Science content standards to the NGSS.

Thank you for your time –

Comment #115

From: Stephen Blake [mailto:stephengblake@gmail.com]
Sent: Monday, August 25, 2014 3:53 PM
To: NGSS
Cc: Samantha Tran; Juanita Wise
Subject: Response to initial draft of NGSS Implementation Plan

Dear CDE Colleagues,

Attached is a letter which provides the response of Children Now to the first draft of CDE's NGSS Implementation Plan.

I may be reached via this email or by telephone at 916-712-8105 should you require clarification of any of our comments.

Best regards,
Stephen Blake

Formal Letter from Children Now

August 25, 2014

Honorable Tom Torlakson, Superintendent of Public Instruction Dr. Michael Kirst, President, California State Board of Education 1430 N Street, 5th Floor Sacramento, CA 95814

Dear Messrs. Torlakson and Kirst,

We at Children Now are excited about the extraordinary potential California's new NGSS-based science standards (hereafter, "CA- NGSS") have for improving the quality of education children receive, for impacting their success in continued education and careers, and for enhancing their opportunities in life. The CA- NGSS' focus on depth of understanding, relevant hands-on experience, and the integration of concepts, disciplines, and even subjects will enrich children's learning and promote the educational gains our state has been working toward since embarking on standards-based education two decades ago.

We commend State Superintendent of Public Instruction Tom Torlakson for undertaking the development of the Next Generation Science Standards Implementation Plan for California (hereafter, NGSS Plan) to assist our state's policymakers and educators in systematically actualizing the CA-NGSS for every student. We also are grateful for having had the opportunity to participate on the Science Leadership Team that provided input into the development of this plan. As stated in its introduction, the NGSS Plan is not a comprehensive action plan; rather, we see it as establishing a scaffold onto which others can build specific strategies and activities in their respective arenas to realize the promise of CA-NGSS for improving all children's science education.

With that framework in mind, we welcome this opportunity to offer comments to the State Board of Education and the California Department of Education regarding ways in which the current draft of the NGSS Plan could be enhanced, prior to its adoption by the Board, in order to maximize its effectiveness in guiding a robust and successful implementation of CA-NGSS in California.

Summary

The pages that follow document a number of substantive issues we would call to the attention of CDE and the Board. However, the following bullets highlight our most pressing concerns, which we hope would be addressed prior to the Board's consideration of the NGSS Plan at its September and November meetings:

- The NGSS Plan should integrate with CCSS implementation plans and activities and build on their successes; and learn from their challenges.
- For assessments, the plan should integrate development with CCSS assessments, provide a clear timeline, and ensure effective training for their administration and use.

- Details of the scope, timing, and resource needs are insufficient.
- An ongoing presence should be established to guide continued implementation
- Professional development strategies must include pre-service training and should be expanded beyond the current focus on training local teacher leaders.
- The state should evaluate the quality of materials and practices it shares online.

General Comments

This document, having been developed by the CDE, is strongly focused on CDE (or the CDE- supported Board) as being representative of "the state". There are many state-level roles, functions, or needs that may not be best fulfilled by CDE, and those should be more explicitly spelled out. These may include roles of the Commission on Teacher Credentialing and other bodies, or generic processes that a service provider might carry out to the benefit of all districts and schools.
Integration is the key underpinning of CA-NGSS, which focus on concepts and practices that cross grade levels, disciplines and themes. Moreover, CA-NGSS is substantially integrated with new standards in other *subject*s, particularly those based on the Common Core State Standards (CCSS). For example, science learning modules are coordinated, by grade level, with mathematics instruction students would be expected to have received or be receiving simultaneously. Yet, the NGSS Plan effectively fails to acknowledge CCSS generally. Furthermore, the NGSS Plan does not acknowledge the CCSS Implementation Plan, which has been guiding state and local activities for the past two years. Rather, the NGSS Plan reads as if it is built from scratch, when in fact many of its elements or activities do or should constitute the application of a CCSS Plan activity to a third subject area: science. As we move into actual implementation of CA-NGSS, we would do well to learn from recent experience with CCSS.

Similarly, many of the activities cited within the matrix are not integrated with, or necessarily informed by, activities that are taking place across the nation. California could learn from other states, as well as national consortia working on implementation of NGSS and CCSS.

The many elements of the NGSS Plan will require significant financial resources to carry out. In numerous sections, the matrix refers to the identification and pursuit of "resource opportunities"; often, these references strongly imply grant monies. As we know from the implementation of CCSS, effective implementation will require the investment of billions of dollars – whether new monies or targeted monies from existing funds. This should be acknowledged – ideally some estimate of the scope and scale of investment would be provided – and if CDE is committed to pursuing state resources, as it did for CCSS, we believe that commitment should be stated. Otherwise, the current language may be read by many LEAs as indicating that their ability to implement CA-NGSS is dependent on their own fundraising success.

The rudimentary timeline provided on page 6 would be more useful to educators, policymakers, parents, and stakeholders if it were substantially expanded to provide more detailed timeframes and milestones that foster the reader's ability to track this expansive enterprise and the integration of its parts. For example, designating 2015-2018 for "Implementation of NGSS" does little to support LEA's planning of the activities they will need to conduct in order to incrementally or fully implement within that four-year band.

The relational timing of some of the activities in the matrix is not always clear: the "transition" activity of one entity may follow the "implementation" activity of another,

whereas the matrix may read to many as if there is an awareness phase (e.g., this year), followed by a transition phase (e.g., 2015), followed by implementation. Some narrative early in the document explaining when phases are aligned within the matrix and when they are not may be useful.

While we recognize the utility of a scaffold at this level of complexity and appreciate the rapid timeframe on which CDE worked to develop this NGSS Plan, the matrix contains very little information regarding how LEAs or Support Providers might accomplish the objectives set forth. It would be useful to provide greater guidance in many instances. It is with this in mind that we believe that in addition to the scaffolding of this NGSS Plan, ongoing guidance will be needed as state and local policymakers and educators, as well as the vast network of Support Providers and partners, progressively develop action plans and engage in the actual implementation activities that will bring successful science education to our children. The NGSS Plan describes a "State Leadership Collaborative" (in Strategy 1) to meet on a bi-annual basis. We believe it may be appropriate to establish this or a similar body to more continuously address the many complications that will arise, and advise policymakers on them, as implementation progresses.

Strategy 1 – Professional Learning

The focus of this Strategy matrix is the professional development of current teachers via training of teacher leaders and administrative leaders, and the subsequent delivery of professional development by those leaders, at the local level. We think this is a practical primary focus, given that the vast majority of science teachers are already in the classroom and at present little capacity exists to retrain them in NGSS-based science instruction. At the same time, many external (non-LEA or county-office based) providers of in-service professional development – such as the Subject Matter Projects or providers of induction programs – comprise an important part of the teacher education landscape. While their role is referenced in isolation on page 26, we recommend that their involvement, as partners and as entities that may have knowledge or best practices that could inform others, be incorporated throughout the many elements of Strategy 1.

In this same vein, we are concerned about the capacity of local districts to build out effective, well-trained professional learning communities with expertise in CA-NGSS instruction. Achieving this may require more than one or two teacher leaders trained externally; it may require externally trained district teams, augmented with sufficient resources and support when they return home to reshape local professional practice.

Shifting instructional practice through effective professional development will be critical to successful CA-NGSS implementation, and this will entail a sea change for science teachers. At the same time, this is one area that benefits particularly strongly from initial CCSS implementation planning and activity. The philosophical and instructional shifts necessary to teach based on our newest standards – emphasizing depth of understanding, critical thinking, and conceptual learning over memorization of facts –

have already begun in schools through CCSS. Administrators and teacher leaders already understand and are incorporating these new approaches, and importantly, whole school cultures are aware of the shifts that are taking place. This likely means, at minimum, that the awareness phase activities will require less effort than the NGSS Plan suggests.

This Strategy is silent on the many needs of pre-service training for teachers, and we strongly recommend adding key guidance for the California Commission on Teacher Credentialing, as well as for institutions of higher education and others that provide pre-service education. This guidance would be relevant not only to those entities: LEAs using the NGSS Plan for guidance should have these revised strategies at the forefront of their thinking, as well. At minimum, the Commission will need to revise its subject matter and credentialing standards, as well as teacher performance expectations, and support delivery programs in transitioning to these standards; eliminate specialized credentials that cannot support NGSS; modify administrative program standards to accommodate support of transition to NGSS; and revise CSET examinations. Institutions (including districts with internship programs) will need to comprehensively modify the content of their credentialing programs in incorporate NGSS content and the new methods needed to be able to effectively convey the learning principles and techniques that comprise NGSS. In conjunction with this, we recommend the inclusion of guidance for districts regarding appropriate considerations for hiring practices that will promote effective transition to an NGSS- based science education in each district.

Strategy 1 suggests (page 19) that LEAs seek opportunities for the recognition of their exemplary practices in NGSS-based professional development. Similarly, it recommends (page 21) that each LEA "researches and employs" existing resources in preparing educators. We further suggest the establishment of a statewide repository of *vetted* best practices – including any newly recognized exemplary programs – to facilitate other districts' readily learning from the most effective practices. (If this is the intent of the NGSS digital center, that is insufficiently detailed.)

This Strategy focuses on the involvement of the Association of California School Administrators (ACSA) and the California School Boards Association (CSBA) in developing various aspects of administrator professional learning. We appreciate the importance and expertise of these two preeminent leadership organizations, and at the same time recommend the inclusion of a wider set of participants, including those from the private sector, with expertise in the development and training of administrators.

Finally, on page 17 of this strategy, the NGSS Plan suggests that the CDE should "provide expanded opportunities for teachers to participate… [in] professional learning opportunities" and "…develops and implements administrator training…" While we agree that these are important functions to be carried out within the scaffolding, we believe that the delivery of training to educators is not, and has never been, a CDE role.

<u>Strategy 2 – Instructional Resources</u>

We believe the layout of this Strategy is sound, and particularly commend CDE for its attention to equity in the development of instructional resources that will serve all students.

We are concerned that the proposed State role in the Implementation phase for Promoting Equity is limited to reviewing state needs, evaluating resources, etc. We believe there is an appropriate function for a state, or state-designated, entity to survey the effectiveness of districts' selection and use of materials in ways that promote equitable instruction.

As stated above, a key aspect of all of California's newest standards is the integration of subjects students will learn. However, this Strategy is described as if science materials are developed independently. We know CA-NGSS would have certain science instruction presented in carefully constructive narrative form, consistent with *and teaching to* English Language Arts standards, and other science instruction is based in mathematical formulae and problems, consistent with CCSS for Mathematics. Teachers should have ready access to science materials that are integrated to ELA and math standards, and should be made aware of ELA and math materials that incorporate science content.

This strategy places California as working fundamentally in isolation. We recommend an explicit recommendation that connects our state's efforts more directly to those in other states – both to draw on what they learn and to contribute to others' awareness of and access to quality materials.

Correction: On page 31, under "Investigate and Select Instructional Materials", it appears that the "Transition" and "Implementation" entries have been reversed.

<u>Strategy 3 – Assessment</u>

This strategy is very forward-looking, since new science assessments will follow other implementation activities; therefore, this section is understandably limited in content. But to give meaningful guidance to policymakers and educators, we believe a bit more substance is necessary here. Furthermore, we think that the guiding principles and criteria used to evaluate

available assessments and the development of new assessments should be aligned to the criteria used for similar assessments under CCSS. This will ensure the same values are used for a high quality assessment system for both NGSS and CCSS.

Additionally, we believe the NGSS Plan for this Strategy should respond to lessons learned from CCSS implementation. Thus, CDE should, at minimum, establish not just a "training guide", but appropriate standards for what constitutes effective training on the use of formative and summative assessments to support their various purposes. We also think it appropriate to establish a monitoring function for quality and effectiveness. Absent that, the potential benefits from NGSS-aligned assessments to

teachers and students are at the mercy of a “buyer beware” approach to an external support providers’ market of training.

All stakeholders would benefit from having a more explicit timeline for development, field testing, and rollout of the science assessment. This will allow them to better integrate their assessment-related activities with their instructional and materials implementation activities.

As a general scaffolding we have two concerns, both pertaining to a state, or statewide, role:

- As has been the case with the developing assessments for CCSS, we believe it is critical that the process of developing CA-NGSS aligned assessments incorporate a robust engagement of stakeholders, and recommend that the matrix explicitly express this.
- The element “Development of Statewide Science Assessment System” does not explicitly indicate the necessary alignment to federal guidelines.

Strategy 4 – Parents and Guardians, Early Childhood, Expanded Learning

We commend the NGSS Plan for its recognition of the critical importance of engaging parents and guardians, and ensuring effective integration between both early learning experiences and expanded learning opportunities and the core K-12 science experience children will encounter.

Under the state activities for Products and Tools (page 41) we recommend that the NGSS Plan text more explicitly state the intent to include program materials; current text may be interpreted to read as if it focuses on awareness and communication for parents/guardians, rather than also supporting program changes in early childhood and expanding learning settings that will integrate with CA-NGSS aligned instruction in the traditional K-12 settings.

Under Support Provider activities, the top-line entries for “Communication” appear to more appropriately belong under the “Products and Tools” or “Professional Learning” headings. In addition, there may be other entities more appropriate than CDE for leading some of these collaborations. For example, early childhood support providers might more effectively collaborate with the state’s First5 Commission to determine best practices, plans, tools, and roles.

Strategy 5 – Postsecondary and Business Communities

We particularly commend the NGSS Plan’s recommendation to collaboratively develop a recommended state pathway and articulated transition plans to promote all students having the opportunity to pursue college and careers in STEM fields. We know that a lack of knowledge of the requirements leads to countless kids – even those with high academic performance – being shut out of opportunities.

There are benefits to isolating the participation of postsecondary and business communities into a discrete matrix for the purpose of promoting integration that is focused on student readiness for success in college and careers. It may be as a result of this, however, that the great benefits our research universities and community colleges can provide the NGSS implementation enterprise in other facets of the NGSS Plan have been lost. Higher education enterprises are rarely mentioned in the other 7 Strategies, even when the development of new or analysis of existing research is mentioned; we believe that should be corrected throughout.

The past five years have seen particularly rich development in the integration of college and career readiness, through Linked Learning, course evaluation by our universities, the inclusion of career readiness in our accountability system, and other enterprises. We believe that the focus on CTE Standards cited on page 47 may be too limiting to achieve the goal of college and career readiness that we all seek to attain for children. This section also should include other indicators of collage and career readiness.

Strategy 6 – Resources

We think that the creation of a CA-NGSS digital center can be of great benefit to educators, policymakers, parents, and other stakeholders. As cited above, we believe two conditions must be met to gain the greatest benefit from this resource:
The various information resources, tools, products, materials, and programs posted to the center must be effectively and validly vetted according to transparent metrics. Absent this process, those who seek to use the center would gain little beyond looking things up on the internet. The state/CDE matrix for this Strategy does not explicitly mention metrics or a process for the analysis/valuation of the quality and effectiveness of resources it would upload to the center (there is post-use feedback).

On page 56, the LEA Strategy 6 activities refer to “NGSS resource allocation” under “Disseminate Resources”. This could easily be confused by readers to mean the allocation of targeted funds, so we recommend modifying the language accordingly.

Strategy 7 – Communication

This Strategy sets forth a communications plan for ensuring greater awareness and understanding of CA-NGSS and its implementation. Here we see another example where the NGSS Plan does not acknowledge the vast efforts of the CDE and others with regards to CCSS communications. Failing to do so misses an opportunity to build upon the awareness and understanding

accomplished through that prior/ongoing work and potentially leads to confusion among the general public who may not understand how NGSS and CCSS together represent an important shift in how students are taught.

An additional communication need will be that of LEAs and Support Providers seeking clarification or assistance from the state regarding any of the activities, goals,

collaborations, or strategies cited. It would be beneficial here, and throughout the document, if the NGSS Plan delineated the division within CDE that would have principal responsibility for oversight and support of each of the Strategies, elements, and/or activities.

There is much work ahead to ensure the effective implementation of California's new NGSS- based science standards, and much is at stake for our doing so well. Children Now appreciates the important start the NGSS Implementation Plan provides and stands ready to assist state and local policymakers and practitioners in realizing the great potential of CA-NGSS and all our new educational standards in elevating the opportunities and success of all California's children.

Respectfully,
/s/
Stephen G. Blake
Senior Advisor, Children Now

Comment #116

From: bobby and laura [mailto:bobandlaur05@gmail.com]
Sent: Monday, August 25, 2014 4:01 PM
To: NGSS
Subject: NGSS - Public Comment

The new science standards, Next Generation Science Standards (NGSS) has been given a "C" rating by the Fordham Institute. California's previous science standards were one of two states in the nation that received an "A" grade. According to Fordham, "The content of the NGSS itself fails to ensure that *all* students will be equipped with sufficient content to make real the option of taking more advanced courses in the core STEM disciplines." This weakness in content is particularly noticed in chemistry and physics.

The Next Generation Science Standards, only allows global warming (sorry, "climate change") and evolution to be taught, not as theories, but as fact. The NGSS also teaches that there are too many people on this planet. This means they will be teaching children about population control as a means to solve a problem**.** (MS-ESS3-3),(MS-ESS3-4)Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

NGSS teaches kindergartners that humans are animals. The standards fail to mention that plants need Co2, because that doesn't fit with the agenda, that Co2 is bad for the environment. K-LS1-1 Use observations to describe patterns of what plants and animals

(including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not.

NGSS are functionally atheistic. These standards are drawn from a humanistic, secular, environmental standpoint and do not offer differing theories. U.S. courts have ruled on numerous occasions that religion includes both theistic and non-theistic beliefs. In my view the promotion of a materialistic/atheistic worldview by public education is not consistent with First Amendment principles of religious neutrality.

These standards were written by corporations that have an agenda. Their interest is not the child's best interest, it is in the child's mind, and getting a hold of it for their purpose. As a concerned parent and educator, I strongly recommend against the implementation of the NGSS in it's current form.

Sincerely,
Laura Jones

Comment #117

From: Jessica L. Sawko [mailto:jessica@cascience.org]
Sent: Monday, August 25, 2014 4:24 PM
To: NGSS
Cc: 'Trish Williams'; ilenestraus@yahoo.com; 'Laura Henriques'
Subject: State Implementation Plan - First Draft Public Comment - CSTA

Dear CDE:

Please find the attached letter in response to your call for public comment on the Next Generation Science Standards Systems Implementation Plan for California.

Sincerely,

Jessica L. Sawko
Executive Director
California Science Teachers Association
950 Glenn Drive, #150
Folsom, CA 95630
916-979-7004

Formal letter from CSTA

Date: August 25, 2014

Carrie Roberts
Director, Professional Learning Support Division

California Department of Education
1430 N Street
Sacramento, CA 95814
RE: Next Generation Science Standards Systems Implementation Plan for California

Dear Ms. Roberts:

The California Science Teachers Association (CSTA) thanks the California Department of Education for including CSTA on the state leadership team that worked so hard to develop this first draft of the state implementation plan for NGSS. CSTA is also are grateful for this opportunity to participate in a public review process of the document. CSTA is a professional organization with over 2,500 members. Our mission is to promote high quality science education. CSTA has sent several calls to our membership to participate in this public review process and submit their comments individually to CDE; we are pleased to report that many have done so. This letter and the list of suggested edits included represents the collective voice of CSTA and its members.

It has been 15 years since California has had new science standards. Implementing CA-NGSS is going to require substantial effort from a wide range of stakeholders, led by the state. As with Common Core, NGSS requires a significant educational retooling and this will be a major undertaking at all levels of our educational system. CA-NGSS will require substantial investment in professional learning, new instructional strategies and practices, courage and support to teach in a manner which expects high levels of student engagement by all students, administrative support, buy-in and understanding of how science instruction will look with CA-NGSS, effective communication with parents and the community, and a commitment to teach science to every child, every day of every year.

This first draft of the plan offers a good deal that we like that addresses several of the critical components outlined above; however, we have suggestions we offer below and attached that will go a long way in improving the document. Putting together a comprehensive state plan is a complex and daunting task with many interrelated components. The suggestions below will, we believe, help clarify the plan.

Recommendations for Improvement:

- The plan is difficult to comprehend in terms of timeline, what tasks will happen when, what needs to come first, and what tasks are dependent upon completion of another task. Each component has awareness/transition/implementation phases, which are temporally dependent, and activities across the three primary groups of CDE, LEAs, and Support Providers are also temporally dependent for some elements. It is hard to get a good sense of the full scope of each element within and across each guiding strategy, each of which may have a different time frame. At minimum years (e.g. 2014/2015) should be added to tasks and tasks should be coded and cross referenced in some way so that it is easier to see the connections between the tasks.

- The plan fails to adequately represent the costs associated with realizing the plan that will be borne by LEAs and Support Providers. By only indicated with an asterisk those items that will cost CDE money, there is a significant lack of acknowledgement of the costs of this plan for LEAs and Support Providers. To date, many LEAs and Support Providers have donated, and continue to donate their time, resources, and expertise to bring California to where it is today in terms of NGSS review, adoption, and early implementation work. This donation of time and expertise needs to be recognized by the state. Additionally, this donation may not be sustainable, and the state's plan needs to acknowledge that elements and activities borne by LEAs and Support Providers do come at a cost as to more fully portray the cost of plan implementation. This more accurate portrayal will be critical for potential funders, both the state and private funders, to comprehend the financial resources that will be required to successfully implement CA-NGSS.

- The plan fails to address the critical component of teacher preparation. CSTA strongly urges CDE to add an 8th element to guiding strategy #1 to address teacher preparation and credentialing. Addressing the needs of teacher preparation program re-tooling and updating credentialing requirements is critical to achieving the strategy of ensuring that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS. CSTA recognizes that teacher preparation program requirements and credentialing are the purview of the CTC. This does not mean that they should not be a part of the state's plan for implementation. Inclusion of this critical element will allow readers and implementers of the plan can see the full scope of work to be done to successfully implement the new standards.

- The plan fails to recognize and address the incredible change that needs to take place, and the incredible lift it will be, to ensure that a high quality science education is available every day of every year to every student. The lack of science education in California at the elementary level is well documented and known (see WestEd's *High Hopes, Few Opportunities: The Status of Elementary Science Education in California*) . The state implementation plan should directly address this issue by focusing specific strategies, elements, and tasks to address this problem, including accountability measures (in addition to those associated with assessment), teacher preparation and credentialing, inservice teacher professional learning, adequate resources and equipment, and adequate time for science during the school day. While some of these aspects are addressed within the plan, they are not specifically targeted toward elementary. What California needs at the elementary level differs somewhat from what it needs at the secondary level, and this difference should be acknowledged and addressed in the plan. While every young child approaches their world as a scientist that interest seems to wane over time – our goal must be to keep that interest and

enthusiasm alive if our state is to make innovative contributions to science for our nation and the world.

- The plan portrays implementation has having an end point. In our view, many of the activities need to be ongoing in order to maintain a high-quality science education system.

- Achieve and the work of other states seem to be missing from this plan. We have heard time and again how much Achieve is intending to invest in a successful implementation of NGSS in California, however they are mentioned only once in the plan (outside of the listing of available resources and references).

- Support for teachers is critical to the success of NGSS. The support needs to come from CDE, LEAs especially, and Support Providers. This support needs to be early, often, and on-going. We need teachers who are prepared to teach science with the same excitement that reflects this profession.

- The element of Communication in Strategy 4 is a welcome one. This element should be further expanded and made clear that the Awareness, Transition, and Implementation phases of the Communication element should precede full classroom and assessment implementation. We know from CCSS implementation that the public messaging campaign is critical. NGSS messaging needs to be on the front end rather than response. Parents and the community at large need to see the value of NGSS and support it.

Just as important as our recommendations for improvement are our recognition of what we like and what should be maintained as the plan is modified before final presentation to the State Board of Education in November.

- We are excited to see that the coalition building within the science education community is formalized in the plan. As mentioned previously, to date, key science education stakeholders have volunteered considerable time and effort to jointly develop and disseminate information and professional learning opportunities to support awareness around NGSS. The state, regional and local leadership teams being forged in this plan will keep that work moving forward.

- The inclusion of both teachers and administrators in the professional learning guiding strategy is critical to successful CA-NGSS implementation. No educational reform can be successful without the support of teachers, and in order to have the support of teachers, they must be provided with the tools and information to be successful. Many administrators are focused solely on Common Core implementation, getting administrators onboard to support CA-NGSS implementation and their teachers, is mission critical.

- The comprehensive NGSS Digital Center can be an invaluable resource for teachers, parents, community and other stakeholders. Not only can this serve as

a repository for excellent NGSS instructional resources, it can serve as the hub for timely information, messaging, professional learning opportunities and the like.

- The Early Implementation Initiative promises to be very useful in informing the needs for professional learning, instructional materials and support, and logistical and communication challenges that must be overcome in order to realize successful implementation. The ongoing support of CDE, LEAs, and Support Providers is critical to the initiative's success and the dissemination of lessons learned.

- In every element in Strategy 4 (and in several other strategies and elements) every instance - Communication, Products and Tools, Professional Learning, and Resources - evaluation of how the plan was progressing was explicitly part of the Implementation Phase. Evaluation is critical to the plan's success.

The end goal of science for every child every day of every grade is worth the effort we must put forth to get there. As you heard in testimony from educators and the business community, science and STEM hold the key to our future. Our personal and state livelihood depends upon us committing our time, effort, and financial resources to fuel the implementation efforts so that our students can be successful in our ever-changing world.

Attached is a document with specific suggested edits, comments, and questions to clarify the draft plan. CSTA recommends that the CDE reconvene the state leadership team together with the appropriate staff members of the various CDE departments to address the recommendations we make as well as other feedback received via the public comment process.

Sincerely,
/s/
Laura Henriques President

cc: Trish Williams and Ilene Straus, State Board of Education NGSS Liaisons

Page: 3	**Original Text:** *Jill Grace, Seventh Grade Science Teacher, Palos Verdes Peninsula Unified School District and California Science Teachers Association Middle School Director*
	Recommended New Text: Jill Grace, Science Teacher, <u>Palos Verdes Intermediate School,</u> Palos Verdes Peninsula Unified School District and California Science Teachers Association Middle School Director
	Comments/Rationale: This edit aligns Jill's description with the other teachers

General Comments:

Page: 10-11 Last and first lines on those pages, respectively.	**Request for clarification within the text of the plan:** County Offices of Education are listed in both the definition of LEAs and Support Providers – are they both?

Page: 14, 15, 19, 23 Description of the guiding strategy.	**Original Text:** *Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.*
	Recommended New Text: Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared <u>with the</u> <u>proper pedagogy and knowledge to teach and facilitate student learning of</u> <u>the three dimensions of NGSS</u> and ~~to teach~~ to the levels of rigor and depth required by the CA NGSS.
	Comments/Rationale: CA-NGSS will require teachers to not only be able to teach, but also to facilitate student learning and student dialogue. It is critical that teachers are not only capable of teaching and facilitating to the levels of rigor and depth required, but also that they have the capacity to integrate the three dimensions.

Page: 14 Introductory paragraph	**Request for an additional element in the plan:** Strategy 1 is described as: *Facilitate high quality professional learning opportunities for educators to ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS.*
General Comments: If the goal of strategy 1 is to "*ensure that every student has access to teachers who are prepared to teach to the levels of rigor and depth required by the CA NGSS* " then the strategy should have an element to address teacher preparation programs and credentialing and preservice teacher professional learning needs. Work towards this has already begun at the CTC. This work and any additional work necessary to ensure students have access to adequatly prepared teachers should be included in the plan. While CDE and LEAs may not have a role with this element, the Support Providers certainly do and should.	

Page: 14 Introductory paragraph	**<u>Request for clarification within the text of the plan:</u>** *"Successful enactment of this strategy requires a collaborative partnership of the CDE, LEAs, and professional learning support providers including, but not limited to: county offices of education, professional learning providers, institutions of higher education, science centers and museums, science informal education providers, and professional organizations."* Professional organizations are not clearly defined in the plan. Please include a definition or a few examples in either the introduction or in the appendix.

Page: 14 Introductory paragraph	**Original Text:** *The shifts require a systems approach to science education, supported by policies, programs, personnel, and resources.*
	Recommended New Text: The shifts require a systems approach to science education, <u>whereby</u> policies, programs, personnel, and resources <u>all support common goals</u>.
	Comments/Rationale: "Systems approach" should be clarified - many people who will read the plan may not be familiar with this term.

Page: 14 Introductory text, paragraph 3.	**Original Text:** *This strategy incorporates many of the shifts in instructional practice required by the CA NGSS. This includes professional development incorporating three- dimensional (3D) teaching and learning (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts); science for all students; and connections to other applicable CA state content standards relevant to each topic and grade span.*
	Recommended New Text: This strategy incorporates many of the shifts in instructional practice required by the CA NGSS. This includes professional development incorporating three-dimensional (3D) teaching and learning (Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts); science for all students<u>, every grade, every day</u>; and connections to other applicable CA state content standards relevant to each topic and grade span.
	Comments/Rationale: This is an easy location and opportunity for the state to signal it support for science to be a part of every student, every day, every year.

Page: 16 **Phase:** Awareness **Element/Row:** Policy and Legislation	**Original Text:** *The CDE develops a method/rubric for determining quality science programs and instruction.*
	Recommended New Text: The CDE develops a method/rubric for determining quality science programs and instruction that takes into account the various settings in the state.
	Comments/Rationale: Often, the quality is affected by outside sources - economic level of the community (not necessarily the funding provided by the district), the number of students in a classroom/under the leadership of a teacher, etc. The rubric developed should allow for this.

Page: 18 **Phase:** Awareness **Element/Row:** Resources for teacher/ administrato r professional learning	**Original Text:** **The CDE ascertains the teacher professional learning needs for CA NGSS and creates a Request for Applications (RFA) for development of PLMs to address topics such as: elementary, middle (integrated), and high school science, links with CCSS and CA ELD Standards, and examples of best practices of 3-D teaching and learning presented in the CA NGSS.*
	Recommended New Text: *The CDE ascertains the teacher professional learning needs for CA NGSS and creates a Request for Applications (RFA) for development of PLMs to address topics such as: elementary, middle ~~*(integrated)*~~, and high school science, links with CCSS and CA ELD Standards, and examples of best practices of 3-D teaching and learning presented in the CA NGSS.
	Comments/Rationale: Eliminate the word, "integrated." While the integrated learning progression is the state's preferred model, the state did adopt two models and should provide support for both.

Page: 19 **Phase:** Awareness and Transition **Element/Row:** Local/Regional Leadership Collaborative	**Request for clarification within the text of the plan:** *The LEA invites participation from all local and/or regional stakeholders to join a regional collaborative to support CA NGSS implementation.* *The regional collaborative establishes a meeting schedule to share strategies and challenges.*
	Comments/Rationale: How are the regional collaboratives described here different from the coalition that is part of Strategy 8? If these collaboratives are one in the same, they should be linked together in some way. If not, language should be modified or clarified to distinguish the collaboratives.

Page: 21 **Phase:** Awareness **Element/Row:** Model Implementation	**Original Text:** The LEA identifies promising NGSS programs and practices.
	Recommended New Text: The LEA identifies promising NGSS programs and practices using the rubric developed by the CDE.
	Comments/Rationale:

Page: 23 **Phase:** Awareness **Element/Row:** Practices and Procedures	**Original Text:** Professional learning support providers identify LEA content and resource needs.
	Recommended New Text: Professional learning support providers identify LEA content, pedagogical, and resource needs.
	Comments/Rationale: It is critical that both content and pedagogy be addressed.

Page: 23 **Phase:** Transition **Element/Row:** Practices and procedures	**Original Text:** Professional learning support providers provide technical assistance to LEAs based on identified CA NGSS content and resource needs.
	Recommended New Text: Professional learning support providers provide technical assistance to LEAs based on identified CA NGSS content, pedagogical, and resource needs.
	Comments/Rationale: It is critical that both content and pedagogy be addressed.

Page: 23 **Phase:** Awareness **Element/Row:** Practices and Procedures	**Original Text:** Professional learning support providers, as members of state and regional collaboratives, provide feedback to LEAs and CDE about CA NGSS professional development best practices and policies.
	Recommended New Text: Professional learning support providers, as members of state and regional collaboratives, provide feedback to LEAs and CDE about CA NGSS professional development best practices and procedures.
	Comments/Rationale: Or policies and procedures if policies needs to stay in. Either way, procedures should be a part of this as this is the "Practices and Procedures" element.

Page: 24-25 **Phase:** n/a **Element/Row:** Administrator Professional Learning	**Formatting Recommendation:** Insert a page break between "Teacher Leadership Academies" element and "Administrator Professional Learning" to ease reading.

Page: 25-26 **Phase:** n/a **Element/Row:** Early Adopter Districts Network	**Formatting Recommendation:** The heavy bold line distinguishing between "Administrator" and "professional Learning" needs to be moved down (right now it's intersecting the administrator row at the page break)

Page: 25 **Phase:** Awareness, Transition, Implementation **Element/Row:** Administrator Professional Learning	**Request for clarification within the text of the plan:** *Professional learning support providers collaborate with the LEA to develop and provide professional learning for administrators aligned to:* • *CA NGSS awareness* • *Policy considerations* • *Site implementation plan* There is no difference between the awareness, transition, and implementation – was that the intention?

Page: 25 **Phase:** Awareness **Element/Row:** Model Implementation	**Request for clarification within the text of the plan:** *Professional learning support providers work together to develop and disseminate indicators of the best CA NGSS practices.* Are these indicators different or apart from the CDE rubric described Strategy 1, CDE portion of the plan, Policy and Legislation? If so, why the two rubrics? If not, then combine the two tasks or in some way link them so that it is clear they are the same.

Page: 25-26 **Phase:** Implementation **Element/Row:** Early Adopter Network	**Original Text:** The CDE and SBE follow the progress of the Initiative and help to share findings and resources.
	Recommended New Text: The CDE and SBE follow the progress of the Initiative and help to share findings and resources and utilize partners in distribution and dissemination of findings and lessons learned.
	Comments/Rationale: CDE should take advantage of existing communication networks outside of those managed by CDE and SBE to distribute and disseminate information. This will allow for a much broader reach of the information.

Page: 28 Third paragraph	**Request for clarification within the text of the plan:** *This strategy incorporates two changing contexts for instructional resources. The first is new instructional resources that are likely to be dynamic in format and content, e.g., digital materials, open educational resources, and hybrid programs. This provides a variety of options to the LEAs.* The second context is never addressed or defined. This needs to be updated to include the second context or edited to remove reference to two contexts.

Page: 30 **Phase:** Awareness **Element/Row:** Promotes Equity and Equal Access	**Original Text:** *The CDE provides research-based guidance and information for districts to help determine the necessary instructional resources and facilities for equitable high quality, and safe science instruction. This information will presented in the Science Curriculum Framework and the Science Safety Handbook.*
	Recommended New Text: With support from CA IHE science education researchers, the CDE provides research-based guidance and information…
	Comments/Rationale: This task would benefit from the highly qualified IHE science education faculty who have unique expertise in this area.

Page: 31 **Phase:** Transition **Element/Row:** Understand the Framework	**Original Text:** *The LEA representative(s) train teacher leaders and curriculum leaders within the LEA to build local capacity for implementation of the CA NGSS.*
	Recommended New Text: The LEA representative(s) train teacher leaders and curriculum leaders within the LEA to build local capacity for implementation of the CA NGSS. LEA supports local representatives(s) to attend additional professional learning opportunities to deepen understanding of framework for implementation.
	Comments/Rationale: This is an example of a location where it needs to be made clear that implemenation is more of an ongoing process, rather than one that has a defined endpoint.

Page: 31 **Phase:** Implementation **Element/Row:** Understand the Framework	**Original Text:** *Teacher leaders and curriculum leaders provide support at school sites to use the framework as a tool to implement the CA NGSS.*
	Recommended New Text: Teacher leaders and curriculum leaders provide support at school sites to implement the CA NGSS and use the framework as a tool for implementation.
	Comments/Rationale: Adds clarity.

Page: 32 **Phase:** Transition **Element/Row:** Understand the Framework	**Original Text:** *Support providers implement activities and strategies that facilitate the roll-* *out of the science framework.*
	Recommended New Text: Support providers individually and collaboratively implement activities and strategies that facilitate the roll-out of the science framework.
	Comments/Rationale: The state would benefit greatly from the continued collaboration by support providers.

Page: 32 **Phase:** Implementation **Element/Row:** Understand the Framework	**Original Text:** *Support providers evaluate strategies and activities and adjust according to local needs.*
	Recommended New Text: Support providers individually and collaboratively evaluate strategies and activities and adjust according to local . . .
	Comments/Rationale: The state would benefit greatly from the continued collaboration by support providers.
Page: 34 **Phase:** n/a **Element/Row:** intro to strat #3	**Original Text:** 2nd paragraph, 3rd sentence "C NGSS" should be CA NGSS
	Recommended New Text: CA NGSS
	Comments/Rationale: Typo

Page: 35 **Phase:** Transition **Element/Row:** Development of Formative Assessment Tools	**Original Text:** The CDE, in collaboration with appropriate assessment professionals, identifies and develops sample digital CA NGSS formative assessments, tools including samples of student work, performance task scoring rubrics, and other resources based upon the criteria developed in the awareness phase.
	Recommended New Text: The CDE, in collaboration with appropriate assessment professionals including classroom teachers,…
	Comments/Rationale: Ensures there are individuals developing assessments with recent classroom experience.

Page: 36 **Phase:** Transition **Element/Row:** Development of Formative Assessment Tools	**Original Text:** The LEAs implement chosen or developed formative assessment tools aligns with CA NGSS.
	Recommended New Text: The LEAs implement chosen or developed formative assessment tools aligned with CA NGSS.
	Comments/Rationale: Typo

Page: 39 **Phase:** **Element/Row:** Products and Tools	**Original Text:** Products and Tools. This element includes collaborative development of a variety of multimedia and multilingual tools. These tools include web portals, PowerPoint presentations, newsletter templates, tip sheets, moments of science, careers, science in the environment, and hands-on modules and science kits for use by parents and after school clubs. The products and tools are disseminated and revised based on feedback.
	Recommended New Text: Products and Tools. This element includes collaborative development of a variety of multimedia and multilingual tools. These tools include web portals, PowerPoint presentations, newsletter templates, tip sheets, moments of science, careers, science in the environment, and hands-on modules and science kits for use by parents and out of classroom learning settings. The products and tools are disseminated and revised based on feedback.
	Comments/Rationale: "After school clubs" seems overly specific, these tools could have many uses for after school clubs, outdoor science camps, summer science learning programs, informal science centers, etc. Rather than try to list them all, we suggest the above edit.

Page: Page 39 Strategy four **Phase:** **Element/Row:** Introduction	**Original Text:** CA NGSS into programs and activities beyond the K–12 school setting. Enactment of this strategy requires a collaborative partnership of: the CDE, the LEAs, and support providers including but not limited to: parent groups, science centers and museums, county offices of education, professional learning providers, youth clubs/programs, and afterschool programs.
	Recommended New Text: CA NGSS into programs and activities beyond the K–12 school setting. Enactment of this strategy requires a collaborative partnership of: the CDE, the LEAs, local community businesses, and support providers including but not limited to: parent groups, science centers, aquariums, and museums, county offices of education, professional learning providers, youth clubs/programs, and afterschool programs.
	Comments/Rationale: Integrating education activities into the local community via partnerships with businesses leads to higher engagement and service learning opportunities. We recommend adding "aquariums" to lists that include science centers and museums. It is clear this list is trying to be inclusive, and this edit seeks to add to that inclusiveness.

Page: 40-41 **Phase:** Awareness **Element/Row:** Communication	**Original Text:** **The CDE seeks resources to develop a multi-media, multi-lingual public information outreach campaign with training modules about the CA NGSS differentiated for:* *o Parents and guardians* *o Early childhood communities* *o Expanded learning communities* *o Other settings outside of the K-12 community.*
	Recommended New Text: *The CDE seeks resources to develop a multi-media, multi-lingual public information outreach campaign with training modules about the CA NGSS (instructional shifts, instructional resources, assessment, etc.) differentiated for: o Parents and guardians o Early childhood communities o Expanded learning communities o Other settings outside of the K-12 community.
	Comments/Rationale: This edit applies to the LEA and Support Provider sections as well. There needs to be a robust communication plan that informs parents and the public about new science assessments, how they are different, why they are different, why scores may drop, etc. To many, the scores and assessment issues will be a bigger deal than

	the fact that we have new standards and shifts to instruction.
General Comments: The key constituent here is the parents. The parents need to understand how science instruction (and homework assignments) will change and they need to understand how science assessments will change.	

Page: 41 **Phase:** Awareness, Transition, and Implementation **Element/Row:** Resources	**Request for clarification within the text of the plan:** Financial resources, instructional resources, or both? – Clarity is recommended.

Page: 53-58	**Request for clarification within the text of the plan:** Financial resources, instructional resources, or both? – Clarity is recommended.
General Comments: When reading the introduction section it seems like resources are financial as well as material/tangible resources. Reading the PEM, however, it seems like teaching resources, PD resources, communication resources. The need for financial support for full implementation of NGSS cannot be underestimated and that needs to be highlighted in this section.	

Page: 56 **Phase:** Awareness **Element/Row:** Seek and Create Resources	**Original Text:** *The LEA investigates resources available on the NGSS digital center, resources within the LEA, and resources from Support Providers.*
	Recommended New Text: The LEA investigates resources available on the NGSS digital center, resources within the LEA, and available from other NGSS adopted state LEA's, resources from Support Providers.
	Comments/Rationale: California should seek information from, as well as share with other states.

Page: 65 Introductory text, description of Strategy 8	**Original Text:** *Build coalitions to ensure a common message and to sustain momentum during implementation*
	Recommended New Text: Build coalitions to ensure a common message and to sustain momentum during and beyond implementation
	Comments/Rationale: There should be no end-point to the coalition work. This edit should also be carried over to any othe places the strategy description is used.

Page: 65 Introductory text, paragraph 2.	**Original Text:** *Strategy 8 addresses the design and implementation of coalitions of people who have joined together for the common purpose of supporting the quality implementation of the CA NGSS.*
	Recommended New Text: Strategy 8 addresses the design and implementation of coalitions of people who have joined together for the common purpose of supporting the quality implementation and sustainability of the CA NGSS.
	Comments/Rationale: Adding, "sustainability" implies the continued work of the coalitions.

Page: 66 Description of the "Dissemination" element.	**Original Text:** *The materials deliver the coalitions' advocacy messages for universal and high quality implementation of the CA NGSS.*
	Recommended New Text: The materials deliver the coalitions' advocacy messages for universal and high quality implementation and sustainability of the CA NGSS.
	Comments/Rationale: Same as before, adding "sustainability" (or some similar phrase) implies the work never ends.

Page: 66, 67, and 69 **Phase:** Awareness **Element/Row:** Messages	**Original Text:** *to promote an understanding of the innovations found in CA NGSS and the importance of science education.*
	Recommended New Text: to promote an understanding of the innovations found in CA NGSS, the importance of science education, and how best to support California science teachers.
	Comments/Rationale: This is an opportunity to help publicize what teachers will need to be successful in teaching NGSS.
General Comments:	

Page: 78 **Phase:** n/a **Element/Row:** Appendix D	**Original Text:** Appendix D: CA NGSS Initiatives of Stakeholder Organizations This section will be populated with current and planned initiatives of stakeholder organizations in support of NGSS awareness, transition, and implementation. This will include, but is not limited to: • County Offices of Education Service Offerings – California County Superintendents Educational Services Association • Professional Associations and Stakeholder Organizations

	• Association of California School Administrators (ACSA) • California Science Teachers Association (CSTA) • K-12 Alliance/WestEd • California Science Project – Science (CSP) • California State Parent Teacher Association (PTA)
	Recommended New Text: Add: • Environmental Literacy Task Force • California Regional Environmental Education Community (CREEC)

Comment #118

From: Nate Ivy [mailto:nivy@acoe.org]
Sent: Monday, August 25, 2014 4:25 PM
To: NGSS
Subject: Next Generation Science Standards Systems Implementation Plan Comments

Thank you for the opportunity to comment on the draft Next Generation Science Standards Systems Implementation Plan for California.

Comment #1 Ensure that prior legislation -AB1548 Pavley (EEI)- is faithfully considered while developing NGSS implementation. Among other things, AB1548 calls for "The State Board of Education and the department [to] revise, as necessary, the framework in science to include the necessary elements to teach environmental education, including, but not limited to, all of the following topics:

1) Integrated waste management.
2) Energy conservation.
3) Water conservation and pollution prevention.
4) Air resources.
5) Integrated pest management.
6) Toxic materials.
7) Wildlife conservation and forestry."

Attending to AB 1548 while developing NGSS Implementation in California will add assurance that Environmental Education is appropriately present in California Science classrooms. The full text of AB1548 is available here: http://www.leginfo.ca.gov/pub/03-04/bill/asm/ab_1501-1550/ab_1548_bill_20031003_chaptered.html

Comment #2 Thank you for providing avenues for classroom teachers and informal educators (museum staff, etc) alike to improve their professional understanding of NGSS to help ensure a successful implementation. The Environmental Education community stands ready to share best practices in Environmental Education pedagogy

to help support environmentally themed NGSS Practices, Cross Cutting Concepts and Disciplinary Core Ideas.
In service,

Nate Ivy

Comment #119

From: Burke, Meg [mailto:MBurke@calacademy.org]
Sent: Monday, August 25, 2014 4:40 PM
To: NGSS
Subject: Comments on the draft NGSS Implementation Plan

Dear CDE:
This response to the CDE's NGSS implementation plan is submitted by a team of education staff at the California Academy of Sciences (the Academy). With our institution's long history of science research and education, and our involvement with the NGSS process, we are excited to have the opportunity to provide comments on the plan. As a support provider (in the implementation plan parlance), and as an organization dedicated to supporting high quality science instruction and improving the science knowledge and engagement of California students, the Academy commends the CDE in creating a thoughtful implementation framework and providing the opportunity for us and other stakeholders to comment on the draft. We are excited about the plan, and the prominent role that support providers are given in it. Based on our review, we have several suggestions and questions for you to consider:

1. We are pleased that the support providers are recognized as a valuable member of the NGSS implementation stakeholders, and that we are expected to play a prominent role in the successful implementation of NGSS. However, details are missing to explain how the support providers will be convened; it is a given that efforts like this do not self-organize. Presumably, local and regional STEM networks and pre-existing collaboratives would represent a good starting point for this work, rather than trying to create whole new networks from scratch. It would also be helpful if the plan included examples of possible structures and incentives that would encourage the involvement and collaboration of support providers.

2. We appreciate the important and critical role CDE must and should play in a successful implementation of NGSS. However, we are concerned that the plan relies too heavily on a centralized model for the rollout, with too many steps requiring CDE approval. For example, sharing success and scaling up toolkits for implementation relies on the creation of an "NGSS digital center," including oversight by CDE of what gets posted to this portal. We are all familiar with other

examples of centralized platforms that have not caught on with the intended audiences, or that quickly become outdated. What are the models of success on which the “NGSS digital center” will be built? What connection will this center have with other existing portals and online resource hubs overseen by CDE or others? Perhaps a less centralized approach, instead of relying on regional hubs might be more efficient and have a higher likelihood of sustainability and effective utilization.

3. A second example of the overly centralized approach is the reliance on CDE to teach/train stakeholders on NGSS. The plan emphasizes the importance of involving and keeping stakeholders such as corporations and businesses apprised of the progress of NGSS implementation. This is terrific, since they represent critical partners. But no mention is made of encouraging and building a process for getting input from these partners on what they see as the critical implementation steps to ensure a science-ready workforce. The implementation plan could be more explicit about structures facilitating this kind of two-way dialogue. Successful implementation of the NGSS is going to require true partnerships among all of the stakeholders, and true partners have two-way communications, and each partner needs to have the opportunity to not only provide input but also affect outcomes.

4. The NGSS Implementation Plan shares many similarities in approach and design to the Common Core Implementation plan. What lessons from the implementation of Common Core have been incorporated into this plan? Highlighting these lessons learned will help alleviate concerns and worries on the part of stakeholder groups, and will also demonstrate an adaptive management approach that will be welcomed by the stakeholders involved.

5. The implementation plan emphasizes the importance of collaborations and partnerships with stakeholders and support providers. This is terrific. We would recommend that the plan encourage the leveraging of existing collaboratives, rather than spearheading new ones – except where a new collaborative represents a particular innovation or fills a gap in partnerships.

6. Strategy 3 recommends that “Support providers assist the LEAs with review of analysis of student data from statewide summative assessments to inform and revise curriculum, instruction, and local assessments.” We are wondering what body will authorize or empower the support providers to help make those revisions? We also wonder what metrics will be used to measure success as the implementation plan is rolled out; right now much of the evaluation plan as

presented in the Appendix is more of a checklist that something was done rather than a true assessment of the impact of the action items. True assessment is the only way to inform and refine the process.

7. The plan mentions several new initiatives, including new types of collaboratives, pathway models, the creation of the NGSS digital center, and others. While these are exciting initiatives, we urge the CDE to consider the funding of in-the-classroom resources to implement NGSS as a higher priority than the creation of a new layer of expensive centralized processes and strategies. In an ideal world, enough funds will be raised to cover both needs, but direct classroom support is essential and cannot be skimped.

8. Lastly, we urge the CDE to ensure that the Environmental Literacy Principles already adopted by the State are fully incorporated into the State's NGSS implementation strategy. The more the implementation framework can ensure collaboration with organizations that can facilitate this incorporation, the better.

Again, we commend the CDE and the task forces that have worked so hard to create this thoughtful implementation plan. Thank you for providing this opportunity to help ensure that each and every student in California benefits from a relevant, daily, 21st century science education, and that all stakeholders have a voice in the process and the necessary resources to succeed. We look forward to supporting this strategy in all ways that we can!

Respectfully submitted,

Elizabeth C. Babcock, *Chief Public Engagement Officer and Roberts Dean of Education*
Meg Burke, *Director of Teacher and Youth Education*
Katie Levedahl, *Assistant Director of Youth Programs*
Ben Lavender, *Senior Manager of Teacher Professional Development*
Sarah Soule, *Senior Manager of Teacher Professional Development*
Emily Harris, *Teacher Educator and Instructional Coach*
Amelia Rosenman, *Teacher Educator and Instructional Coach*
Laura Herszenhorn, *Manager of Science Action Clubs*
Rochelle Urban, *Manager of Student Education*
Kathryn Danielson, *Teacher Education Specialist*
Renny Talianchich, *Education Specialist*
Cindy Valencia, *Education Specialist*

The California Academy of Sciences is a globally-recognized scientific and cultural institution housed in San Francisco. Our new facility, a 400,000 square foot, LEED Platinum structure that houses an aquarium, planetarium, natural history museum, and 4-story rainforest all under one living roof, serves close to 1.5 million visitors a year. The mission of the Academy is to "explore, explain and sustain life" and

the institution is an international center for scientific research and education, at the forefront of efforts to understand and protect the diversity of Earth's living things. The Institute for Biodiversity Science and Sustainability supports a staff of over 70 professional research scientists, including 30 Ph.D.-level scientists, supported by more than 100 Research and Field Associates and over 300 Fellows, exploring 12 fields of research: anthropology, aquatic biology, botany, comparative genomics, entomology, geology, herpetology, ichthyology, invertebrate zoology, mammalogy, microbiology and ornithology. The Institute's research collections, which are among the largest in the world, include more than 28 million specimens—essential tools for comparative studies of the natural world and a library of life that documents historical change in biodiversity over time. The Public Engagement and Education Division is the educational and programmatic side of the Academy, delivering over 2.3 million learning engagements year, including serving over 150,000 students a year through field trips and immersive programs, and over 1,500 teachers through professional development offerings. This division includes over 120 staff, 400 volunteers, and 50 student interns. Audiences served include adults, families, students, teachers, local and global visitors, on-site here at the Academy, off-site, and online.

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Comment #120

From: Brian Rivas [mailto:brivas@edtrustwest.org]
Sent: Monday, August 25, 2014 4:41 PM
To: NGSS
Cc: Jeannette LaFors; Carrie Hahnel; Valerie Cuevas; Margaret Henke; Tracy Solomon; Amber Banks
Subject: Comments from the Education Trust-West Re: NGSS Implementation Plan

Dear Superintendent Torlakson:

Please see the attached comments from the Education Trust-West regarding the draft implementation plan for the Next Generation Science Standards. Thank you.

Brian M. Rivas
Director of Policy and Government Relations
The Education Trust-West
(916) 761-9060

Formal Letter from The Education Trust-West

Date: August 25, 2014
The Honorable Tom Torlakson
State Superintendent of Public Instruction
California Department of
Education 1430 N Street
Sacramento, CA 95814

Dear Superintendent Torlakson:

As a research, policy, practice and advocacy organization, The Education Trust-West writes to respond to the July 2014 draft of California's Next Generation Science Standards (NGSS) Implementation Plan.

First we want to acknowledge that adopting NGSS moves us in the right direction toward ensuring that all of our students across the state have access to rigorous content standards across four disciplines (physical science, life science, earth science and space science) across the grade levels. Too many of our students – but especially our low-income, African-American, Latino students, and English learners -- have had inadequate opportunities to engage in science, math, and engineering content that promotes Science Technology Engineering and Math (STEM) literacy, and prepares them for success in college and future careers in STEM.

We appreciate the intent of the NGSS Implementation plan and the opportunity to participate on the Science Leadership Team that provided input into the development of this plan. The eight key strategies identified for NGSS implementation hold promise for putting us on track to ensure *every* student has access to the resources, quality teaching and other conditions of learning to meaningfully develop their knowledge and skills in research-based science teaching and learning, but will require significant work to do so.
In reviewing the CDE plans for implementing the various strategies, as well as recommendations for LEAs and support providers, we offer the following feedback and recommendations.

Place greater emphasis on equity and access. We appreciate the draft Plan's attention to equitable access to instructional resources (p. 30-32), and the need to ensure all students get access to grade-level science content, including English learners who are specifically referenced a few times throughout the document[1]. Making sure all students' differentiated needs are met is one of the greatest challenges in our schools and districts. And while the plan calls for ensuring that appropriate materials are available for students "beyond specific labels" (p. 29), equity goes beyond a student's access to instructional materials and must include expectations and instructional strategies that assess and address students'

[1] p. 17 re: professional learning, p. 22 re: current professional learning modules illustrating how to support ELs in science, pp. 31-33 re: instructional materials, and p. 34 re: assessment

differentiated learning needs. We recommend that the NGSS Implementation Plan does more to emphasize equity and access – from descriptions of Professional Learning Modules to ensuring LEAs engage and support all of their students in rigorous science curriculum.

Acknowledge and emphasize the connections between NGSS and CCSS. While the NGSS are distinct from the Common Core State Standards (CCSS) and are not included in the CCSS initiative, the standards developed by the National Science Teachers Association, National Research Center, American Association for the Advancement of Science, and Achieve, Inc. are aligned in many ways with the Common Core English language arts/literacy standards and mathematics standards.

Teachers and school leaders have been learning the key instructional shifts demanded of CCSS-ELA and CCSS-Math and many of them have taken steps to make sure those shifts are reflected in their classrooms. And this foundation is an important consideration for how NGSS can be introduced to teachers and school leaders. Because California is one of eleven states which has adopted all three sets of standards, California's NGSS Implementation Plan ought to reflect opportunities for the California Department of Education (CDE), local education agencies (LEAs), support providers and other stakeholders to reinforce the shifts in learning called out by California adopted CCSS and NGSS. This is particularly important as educators are both individually and collectively responsible for ensuring students have access to the standards and coherent instruction that helps them make connections across content areas.

Furthermore, NGSS-aligned materials will not, nor should exist in a vacuum apart from CCSS-aligned materials – something the draft Plan does not address. Teachers will need to access and develop instructional materials that skillfully integrate standards across multiple subjects: science, math and English language arts.

Incorporate lessons learned from CCSS implementation efforts. One lesson we have learned from the CCSS rollout across the state is that phases of implementation: awareness, transition, and implementation are not as clear-cut nor linear as the NGSS Implementation Plan framework implies. It would be helpful for the NGSS Implementation Plan to both acknowledge and represent the phases in a way that reflects that reality, and a visual graphic portraying the work beyond the Program Element Matrics (PEMs) framework – which is unwieldy at times – could potentially help with that.

In addition, we learned that various state consortia were helpful in the CCSS rollout across the country, and California should leverage state consortia opportunities to support the NGSS implementation plan work – something not described in the current draft Plan.

Another lesson is that the length of time it takes the state to develop a framework, approve instructional materials, and determine assessments requires LEAs to begin

implementing NGSS without key components in place. More acknowledgement of and greater supports for the LEAs as they work in the transition phase would be helpful. For example, the CDE could provide examples of strong LEA NGSS implementation plans for 2014-2017, along with examples of high quality professional development to support those plans. Accelerating the timeline would also be helpful.

Align the NGSS Implementation Plan with other initiatives. The current draft NGSS Implementation Plan does not take federal assessment guidelines into account, nor does it suggest that efforts to assess effective science teaching sits within a broader context of effective instruction. At the very least, educators would benefit from an explicit effort to ensure coherence in what both students, teachers, and school leaders are expected to know and do.

Spell out how details of the implementation plan will be further developed. While the draft NGSS Implementation Plan identifies several important strategies and activities, it does not attempt to be a comprehensive action plan. Given that, more specificity for *how* the Plan will be built-out to a level of sufficient detail is critical. For example, how ought the CDE engage with stakeholder groups to determine their needs? How will stakeholders provide input on the assessment development and what is the timeline for completing key benchmarks toward a robust set of science assessments? How will the California Commission on Teacher Credentialing (CCTC) revise its subject matter and credentialing standards to align with NGSS? How will the CDE vet resources for the digital repository? How will teacher preparation programs best (re)organize to ensure their teacher candidates are well prepared to teach to California adopted NGSS standards?

The implementation of NGSS in California will also require significant resources which are not sufficiently identified or quantified in the plan. We recommend establishing a group representing a broad set of statewide leaders beyond the CDE to develop more detailed plans and monitor their implementation. It's possible that the "State Leadership Collaborative" could fulfill this role if it met on a regular basis beyond what is currently stipulated in the Plan, or that a different entity is formed to carry out that function.

Commit to more authentic community, post-secondary, and business engagement. While the draft Plan outlines opportunities for parents/guardians, early childhood and expanded learning providers, as well as stakeholders within institutions of higher education and the business world to engage with NGSS implementation efforts, the plan does not reflect a holistic approach to engaging these key partners that could maximize their contributions. Instead, the draft Plan appears to relegate stakeholders to particular areas of input. We recommend the draft Plan be amended to reflect a less constrained framework for stakeholder input.

We thank you for your leadership in getting this critical work underway, along with the opportunity to offer recommendations to continue this valuable work.

Sincerely,
/s/
Val Cuevas,
Interim Executive
Director The
Education Trust-
West

Comment #121

From: Oberholzer Vandergon, Virginia M [mailto:virginia.vandergon@csun.edu]
Sent: Monday, August 25, 2014 4:47 PM
To: NGSS
Subject: NGSS comments

Dr. Virginia Oberholzer Vandergon
Professor
Dept of Biology
18111 Nordhoff St
Northridge, CA 91330-8303
818-677-6362
virginia.vandergon@csun.edu

To Whom It May Concern:
Here are some brief comments on NGSS.

I took a look at the life science standards for middle and high school

I liked the assessment boundary comments at the top.

Connections to Engineering and Technology are vague but I think when example lessons are done and frameworks done then this might become clear as to how to use these connections.

Crosscutting concepts are nice ways to connect topics.
I am not sure if it is clear how the science and engineering practices will “look” in a classroom again this may become clearer when frameworks are associated with these sections.

When you look at the engineering design standards at the end it helps in clarifying the comment above.

The common core connections promote learning cohorts within a school that might be helpful.

Clarification statements are good and many can be used with students. Some of them contain vocabulary that might be difficult for students like “warranted resources”.

The integrated course design is useful especially if limited time to teach the topics.

I like how different standards are integrated for example when talking about ecosystems and mentioning carbon cycling then it addresses the connection to photosynthesis and cellular respiration.

Also the linking between the life science standards and physical science standards and the earth science standards are good. Making these connections when students are learning the foundational science will hopefully make it easier for students to see the integration of the sciences.

One point of improvement might be some sort of concept map to show connectedness as some people might be able to see the integration better when presented more graphically rather than in a linear form. I would keep the linear form I just would add the graphical form.

Also is there a way to make a single page key points or snapshots page for each disciplinary core as a way to have it so can carry it around or insert in a lesson plan portfolio.

I do like the colored boxes though should remember that if colored blind not easy to distinguish blues and reds and greens (though I suppose you could argue that the columns keep them straight).

I do think that the biggest roadblock for some teachers will be there confidence in teaching some of the integrated topics between the sciences as they might not feel they have the background to teach the science content.

Another issue will be how to use engineering practices in their teaching.

One solution for both issues is to provide well designed professional development (PD) that integrates strong content to give them exposure to that content and practice using engineering concepts for the different topics. This will have to be done in a way to transform teachers thinking so it would have to be followed up with more PD and ways of providing discussion between professional learning communities.

Comments submitted by:

Gini Vandergon

Dr. Virginia Oberholzer Vandergon
Professor
Dept of Biology

18111 Nordhoff St
Northridge, CA 91330-8303
818-677-6362
virginia.vandergon@csun.edu
Comment #122

From: Mary F. Ward [mailto:mary_ward@jusd.k12.ca.us]
Sent: Monday, August 25, 2014 4:50 PM
To: NGSS
Subject: NGSS Implementation

Greetings,

I appreciate the high quality of the NGSS. If we are to make it real in California, we need to allocate resources to classroom teachers so that students can experience science & STEM.

We strongly need resources in these areas: classroom equipment & supplies, classroom technology, and staff learning resources K12. I teach 8th grade science and I coordinate a STEM program 7-8 at my school. I see a lot of concern re: supporting elementary teachers so that they will feel confident teaching science (many are not science majors), and support for middle school teachers who may have an elementary background and have only taught life science. Supporting these teachers will strengthen the K12 spiral of the NGSS.

There should also be resources to get teachers together for collaboration- the fastest way to learn. I find very high quality staff development through NASA & NOAA at the Long Beach Aquarium of the Pacific and JPL in Pasadena, as well as the CSTA conferences.
Thank you,

Mary Ward
STEM Program
Mira Loma Middle School

Jurupa Unified School District
(909) 633-2124

Comment #123

From: Elizabeth Vallentine [mailto:egvallentine@icloud.com]
Sent: Monday, August 25, 2014 4:52 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards

To whom it may concern:

The new science standards, Next Generation Science Standards (NGSS) has been given a "C" rating by the Fordham Institute. California's previous science standards were one of two states in the nation that received an "A" grade. According to Fordham, “The content of the NGSS itself fails to ensure that all students will be equipped with sufficient content to make real the option of taking more advanced courses in the core STEM disciplines.” This weakness in content is particularly noticed in chemistry and physics.

The Next Generation Science Standards, only allows global warming and evolution to be taught, not as theories, but as fact. The NGSS also teaches that there are too many people on this planet. This means they will be teaching children about population control as a means to solve a problem.
"(MS-ESS3-3),(MS-ESS3-4) Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise."

NGSS teaches kindergartners that humans are animals. The standards fail to mention that plants need Co2, because that doesn't fit with the agenda, that Co2 is bad for the environment. "(K-LS1-1) Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not."

NGSS are functionally atheistic. These standards are drawn from a humanistic, secular, environmental standpoint and do not offer differing theories. U.S. courts have ruled on numerous occasions that religion includes both theistic and non-theistic beliefs. In my view the promotion of a materialistic/atheistic worldview by public education is not consistent with First Amendment principles of religious neutrality.

These standards were written by corporations that have an agenda. Their interest is not the child's best interest, it is in the child's mind, and getting a hold of it for their purpose. As a concerned parent, I strongly recommend against the implementation of the NGSS in it's current form.

Sincerely,

Elizabeth Gail Vallentine
egvallentine@mac.com

Comment #124

From: Craig Rusbult [mailto:crusbult@wisc.edu]
Sent: Monday, August 25, 2014 4:54 PM
To: NGSS

Cc: Christopher Roe
Subject: comments - NGSS Systems Implementation Plan for California

Greetings,
For the process of implementation, some ideas from CSLNet seem useful. Very briefly, these are: streamline to emphasize high-priority strategies; explain connections with Common Core implementation in CA, and with NGSS work in other states; build productive collaborations between stakeholders, including educators (in k12 & college), business and community groups.

And one way to improve NGSS itself -- especially its Scientific and Engineering Practices -- is to **write a supplementary glossary** that will clarify definitions-of-terms and intentions-for-terms, to minimize problems that could occur if terms are interpreted in ways that are too loose or too rigid.
Although it would require careful thinking (but that's usually beneficial) the actual writing of a useful glossary could be fairly quick without a lot of extra work. And it could be done now without changing NGSS because a glossary would be supplemental, not part of NGSS.
Some potential benefits, and ideas to consider, are at http://designprocessineducation.com/design-thinking/index.htm?left=dp-te.htm&right=ws.htm%23st

Craig Rusbult

I'm a recently retired educator (PhD in C&I) from U of WI, now in Anaheim CA,
bio-page is http://designprocessineducation.com/labs/craig-rusbult.htm
website home-page(s), http://designprocessineducation.com/design-thinking

Comment #125

From: CitizensSonomaCtyAgainstCC [mailto:cscacc101@gmail.com]
Sent: Monday, August 25, 2014 5:00 PM
To: NGSS
Subject: Feedback for Next Generation Science Standards
Importance: High

To whom it may concern:

The new science standards, Next Generation Science Standards (NGSS) has been given a "C" rating by the Fordham Institute. http://tinyurl.com/7cfas22. California's previous science standards were one of two states in the nation that received an "A" grade. According to Fordham, “The content of the NGSS itself fails to ensure that all students will be equipped with sufficient content to make real the option of taking more advanced courses in the core STEM disciplines.” This weakness in content is particularly noticed in chemistry and physics.

The Next Generation Science Standards, only allows global warming and evolution to be taught, not as theories, but as fact. The NGSS also teaches that there are too many people on this planet. This means they will be teaching children about population control as a means to solve a problem.
"(MS-ESS3-3),(MS-ESS3-4) Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise."

NGSS teaches kindergartners that humans are animals. The standards fail to mention that plants need Co2, because that doesn't fit with the agenda, that Co2 is bad for the environment. "(K-LS1-1) Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not.

I am also very concerned the standards fail to include essential math content that is critical to science learning. Particularly in physics and chemistry, the standards seem to assiduously dodge the mathematical demands inherent in the subjects covered.

I am opposed to adopting inferior standards. Therefore, you must consider changing them with input from parents and teachers not corporations.

Sincerely,

Peggy Nickle
Concerned parent
Sonoma, CA

Comment #126

From: Suzanne Goldstein [mailto:sgoldstein@cslnet.org]
Sent: Monday, August 25, 2014 5:03 PM
To: NGSS
Cc: Chris Roe; Tihanna McCleese
Subject: CSLNet comments on NGSS Implementation Plan, first draft

Please see attached.

Formal Letter from California STEM Learning Network (CSLNet)

Date: August 25, 2014

Tom Torlakson
State Superintendent of Public Instruction
California Department of Education

1430 N Street
Sacramento, CA 95814

Dear Superintendent Torlakson:
I am writing on behalf of the California STEM Learning Network (CSLNet) regarding the first draft of the *State Implementation Plan for California Next Generation Science Standards for Public Schools, Grades Kindergarten through Grade Twelve*. A number of CSLNet partner organization representatives and I participated in the Science Leadership Team (SLT) that worked to develop this plan and I want to thank my SLT colleagues and staff of the California Department of Education (CDE) for their diligent effort to create a plan that is comprehensive and thoughtful about the range of strategies and stakeholders that must be engaged for this effort to succeed.

CSLNet strongly supports implementation of the Next Generation Science Standards (NGSS). California students ranked 45th or lower among all states in science proficiency according to the most recently available National Assessment of Educational Progress data. More troubling, enormous equity gaps exist, with African-American and Latino students, who comprise the majority of California's public school population, achieving an average of 8-11% proficiency in science versus 39-41% for white students. As technology becomes fundamental to daily life, and with STEM jobs growing nearly twice as fast as non-STEM jobs, improving science and STEM education is essential to increasing college and career opportunity for all our students.

CSLNet agrees with the implementation plan's purpose to transform science education in California. We especially applaud the plan's calls for new strategies to invest in professional learning and instructional leadership for teachers and administrators and its attention to public communications and to collaboration with informal education providers, business and community groups. In all of these areas, CSLNet intends to support the plan by leveraging our capability to convene, communicate with and build partnerships among stakeholders from all sectors and regions of California.

At the same time, we believe that this first draft of the implementation plan does needs further development. The scope of the task before us is large and the implementation plan does need to be more explicit about how the state will maximize innovative and collaborative approaches that will allow us to learn from the best instructional models and link to successful system-building efforts already underway within and beyond California. Moreover, the scale of resources that will be needed for this work over many years requires that we have more robust strategies to maximize efficiency and ensure coordination among all stakeholders. To these ends, we offer the following comments and recommendations to help shape the next draft of the plan:

Vision and Timeline

With this plan, the state has the opportunity to present a compelling vision for the transformation of science teaching and learning at all levels. Unfortunately, the current structure of the document presented as a Program Elements Matrix (PEM), obscures

the truly strategic and innovative aspects of the proposed activities. We recommend the plan be presented in a less rigid format that reduces repetition, and that an Executive Summary be added, in order to make clearer the largest and most strategic aspects of the work and to better convey the interrelationships among many of the proposed strategies and elements.

In addition, we are concerned about the timeline and lack of specific progress milestones in the plan. The current timeline appears to delay launch of the awareness phase until fall of 2015. While we wholeheartedly agree that the plan timeline should include an adequate transition phase that ensures teachers are provided with training and instructional materials before new assessment and accountability requirements are fully implemented, we think that many awareness and transition activities need to begin this year in order to be ready for full implementation by 2018. The rigid format of the plan document further inhibits this type of graduated implementation by implying a uniformity to the timeline in all areas rather than helping to clarify how the elements build on each other and where investments should be most focused at each stage. We would like to see more specific timelines and progress milestones identified throughout the plan. We also recommend creating a more flexible presentation, perhaps through an online platform, that would allow readers to sort and view the plan by stakeholder group, strategy or element.

More importantly, the plan needs to give more focus to building capacity in the following areas that are currently underdeveloped in the state and that are critical to the success of NGSS.

- *Elementary science education*: One of the most important and promising aspects of the NGSS is its attention to deepening science instruction in the elementary grades. Unfortunately, recent years have seen little improvement in the low amount of time devoted to science in California elementary schools. In addition, research indicates that most elementary teachers feel underprepared to teach science.[2] Given the scale of work that will be needed to build statewide capacity at the elementary school level, we think the plan needs to articulate more specifically how various elements of the plan will be coordinated to ensure a robust effort at the elementary level.

- *Engineering design:* Another highlight of the NGSS is its full integration of engineering design into science instruction. This will be a new aspect of teaching and learning for most schools in California and therefore requires a dedicated strategy to prepare teachers and develop new curricular resources. This strategy must be closely connected, but not limited to, the state's existing Career Technical Education (CTE) system. Revisions to the plan should make more explicit how engineering will be addressed across major elements of the implementation plan, especially in the development of professional learning and instructional resources.

[2] Center for Teaching and Learning at WestEd. *High Hopes--Few Opportunities: The Status of Elementary Science Education in California*. 2011.

- *Exemplary models and practices:* In many areas, the plan calls on CDE to take the lead in developing and disseminating tools and training materials to assist districts and teachers in identifying and implementing model programs and practices. We agree that this is a central role for the CDE and we support the plan's call in Strategy 6 for an NGSS Digital Center to disseminate resources. We believe, however, that the plan must go further in indicating how the necessary teaching and learning resources will be developed on a more accelerated timetable through more specific investments in CDE staffing and by leveraging the expertise of partner organizations.

- *Teacher preparation:* As CSLNet has set forth in its publication *STEM Can Lead the Way: Rethinking Teacher Preparation and Policy*, significant reforms are needed to the state's teacher preparation system in order to develop a teacher workforce that is prepared for the shifts in content and pedagogy that both the Common Core and NGSS require. While this NGSS implementation plan was not intended to set forth a strategy for such reforms, we do think that the plan should take more explicit steps to ensure linkage between the plan and the work of the state's Commission on Teacher Credentialing (CTC), the California State University system and other institutions of higher education that prepare educators. To that end, we recommend that the plan include convening a panel to report to the CTC on changes in preparation and credentialing that are needed to support and align with the NGSS implementation plan.

- *Post-secondary, business and community partnerships:* The plan makes an important statement about the need and opportunity for higher education, business and community groups to collaborate with K-12 educators to support NGSS implementation. However, it appears to be missing a broader understanding of the truly substantial role these partners could play in developing and delivering new approaches to teaching and learning. While much of this collaboration will take place and be tailored to local circumstances, the state plan should recognize the need for the development of infrastructure within the K-12 delivery system, from creation of collaborative policymaking bodies to establishing district and school-based partnership coordinators, to ensure implementation activities fully leverage the resources and expertise of the external partners.

- *Communications:* We heartily endorse the inclusion of Strategy 7 and its call for a system of communications. Given that communications are woven into nearly all other areas of the plan, we think this is a crucial set of activities for early implementation and where external partners could play a leading role.

Linkage to Existing Systems and Resources

The plan contains essential strategies for the development of professional learning, instructional resources and assessments. CSLNet strongly agrees with the intention to expand professional learning supports and to develop tools for formative as well as summative assessment. For this implementation process to succeed, our classroom teachers must be well-supported at the front end and their needs must be central to all elements of the plan. We are therefore concerned that the proposed plan does not

indicate the full scale of the effort and resources that will be required, particularly at the local level. As we know from the implementation of Common Core, effective implementation will require the investment of billions of dollars – whether new monies or targeted monies from existing funds. Some estimate of the scope and scale of implementation costs should be included to assist policymakers and partners in understanding the investments required. Without such clarification, the current language may be read by many LEAs as indicating that their ability to implement NGSS is dependent on their own fundraising success.

Of equally high importance, the plan should make more explicit how the NGSS implementation activities will learn from and connect to related successful efforts already underway as part of Common Core implementation. The near absence of reference to the CCSS is troubling. The plan should also indicate how California will leverage work being done by other states on NGSS-aligned curriculum, instructional resources, assessments and other implementation components. The formation of a national learning network for NGSS is underway and the plan should indicate how the CDE in particular will find efficiencies by utilizing resources developed by other states and/or collaborate with others in the design of new resources.

Collaboration & Leadership

As previously stated, the plan does an excellent job of identifying the range of stakeholders and roles to be played in carrying out the implementation process. Unfortunately, outside of the Professional Learning strategy, the plan does not specify how the ongoing implementation effort will be led to continue and foster collaborative leadership, monitor progress and make continuous improvements to the plan as more detailed workplans and resources are identified. To this end, we recommend the following:

- Building on the existing Strategic Leadership Team (SLT), create an ongoing, multi- stakeholder leadership group with responsibility for oversight of the plan implementation, including development of more detailed workplans in key areas, annual monitoring of progress towards identified milestones and continuous improvement of the plan in response to lessons learned from the field.

- Identify within the plan document which entities within and/or external to CDE will take ownership for implementation of each element of the plan, and identify a senior leader within CDE to serve as the “point person” to coordinate the implementation work within CDE as well as be a liaison to districts and partners in the field.

In conclusion, I want reiterate CSLNet’s strong support for NGSS implementation and to thank especially Superintendent Torlakson and the CDE team for their hard work in creating this extensive plan. The adoption of the NGSS has provided California and the nation with a once in a generation opportunity to reshape science learning for all

our students. Success in this endeavor will continue to require our best thinking and dedicated resources. CSLNet looks forward to continued collaboration to support this essential work.

Sincerely,
/s/
Chris Roe, CEO
California STEM Learning Network

Comment #127

From: Cavanagh, James [mailto:cavanagh_j@auhsd.us]
Sent: Monday, August 25, 2014 5:27 PM
To: NGSS
Subject: Comment on NGSS Implementation Plan

The state needs to clarify the the choice option for the middle school standards. Will the state adopt discipline specific curriculum for those districts and schools that select this option? Some districts are investing time and resources to investigate the two middle school science standards options and if the expectation by the state is that all schools will select the integrated model then the state should make this distinction.

Equipment - Classroom teachers need a little support to outfit their classrooms with updated safety equipment and other necessary supplies to implement the scientific and engineering practices in a hands-on delivery.

Assessments - Teachers will need much more information on the expectations and demands for assessment. Knowing more about the demands students will face in future assessments the better teachers can plan out and sequence curriculum to best fit their demographics.

Bill Cavanagh
Science Teacher
Sycamore Junior High School
1801 East Sycamore Street
Anaheim CA 92805
714-999-3616

Comment #128

From: Jamie Garman [mailto:garmanja@gmail.com]
Sent: Tuesday, August 26, 2014 12:02 AM

To: NGSS
Subject: NGSS implementation plan

The NGSS implementation plan is a huge step forward for science education especially in the state of California. We are long overdue for an updated focus on science and I am very excited for science to become a larger part of students' education.

Thank you,

Jamie Garman, MS
Science Teacher
Science Department Chair
Harbor Teacher Preparation Academy
1111 S. Figueroa Place Wilmington, CA 90744

Comment #129

From: Suzanne Caffrey [mailto:scaffrey@acsa.org]
Sent: Monday, August 25, 2014 2:42 PM
To: Tom Adams
Cc: Superintendent; Karen Stapf Walters; Patricia de Cos; cmcbride@cde.ca.gov
Subject: Next Generation Science Standards (NGSS) Implementation Plan - DRAFT

To: Tom Adams, Director, Curriculum Frameworks & Instructional Resources Division

From: Kimberly Rodriguez, Advocate, Association of California School Administrators

ATN: Next Generation Science Standards (NGSS) Implementation Plan – DRAFT

Mr. Adams:

On behalf of more than 16,000 education leaders, the Association of California School Administrators (ACSA) would like to share our initial comments on the 2014 DRAFT NGSS Implementation Plan (NGSS Plan). Please see attached.

Suzanne Caffrey
Legislative Associate
Association of California School Administrators
1029 J Street **>>** Suite 500 **>>** Sacramento, CA **>>** 95814
voice 916.329.3804 **>>facsimile** 916.290.0449 **>>web** http://www.acsa.org

Formal letter from Association of California School Administrators
Date: August 25, 2014

To: Tom Adams, Director, Curriculum Frameworks & Instructional Resources Division

From: Kimberly Rodriguez, Advocate, Association of California School Administrators
ATN: Next Generation Science Standards (NGSS) Implementation Plan – DRAFT

Mr. Adams:

On behalf of more than 16,000 education leaders the Association of California School Administrators (ACSA) would like to share our initial comments on the 2014 DRAFT NGSS Implementation Plan (NGSS Plan).
First and foremost, we would like to commend the work of the Science Leadership Team and the California Department of Education (CDE) in the development of this DRAFT plan. ACSA recognizes the importance and enormity of the task in preparing our schools instructionally and physically for the implementation of NGSS. These standards are groundbreaking and require a strong commitment both at the state and local level regarding implementation. ACSA stands ready to assist both our members and the state in all phases of NGSS integration – planning, implementation, and evaluation.

Overall, the NGSS Plan is thorough and addresses the important issues of professional development, instructional materials and assessments from both the state and local perspective. Our members are excited about the implementation of NGSS. As such, they have high expectations regarding its impact on expanding and deepening students' science knowledge. With this in mind, they have concerns regarding the projected timeline with respect to the availability of instructional materials, professional development, and assessments. Specifically, they are concerned there will not be sufficient time for "direct instruction" on NGSS prior to the administration of a high stakes assessment. This concern is consistent with the Common Core State Standards (CCSS) implementation timeline. Our members are currently working furiously at the local level to manage CCSS and the English Language Development standards implementation. We ask the Science Leadership Team to consider all of these issues as it moves forward in discussing an implementation timeline.

ACSA is impressed with the attention the NGSS Plan pays to professional development for both teachers and administrators. As with CCSS implementation, professional development plays a critical role in ensuring quality instruction is provided to students. We would suggest that higher education institutions be included as an integral part to the professional development portions of the plan. Higher Education institutions prepare our future certificated employees, including administrators, and the earlier they become part of the NGSS implementation process the better. There is a role for these institutions to play in terms of supporting professional development and implementation of NGSS. Therefore, we suggest these institutions be included in the next draft of the plan.

The NGSS Plan is comprehensive in terms of the level of instructional detail; however, it is lacking in highlighting the resources needed to ensure quality implementation of NGSS. For example, many school districts will require significant upgrades to their science laboratories, including equipment, to ensure quality implementation of NGSS. Likewise, districts will need to purchase instructional materials for students and develop quality professional development for their staffs. Each of these actions is necessary to ensure comprehensive instruction of NGSS to students and they require adequate resources to complete them. ACSA requests in the next iteration of the NGSS Plan address the need for more resources.

Once again, ACSA supports the overall content of the NGSS Implementation Plan – DRAFT - and we look forward to the next iteration of this critical instructional document. If you have questions regarding our comments, please contact me at krodriguez@acsa.org or 916-329-3811.

Sincerely,
Kimberly Rodriguez
Legislative Advocate

cc: State Superintendent Tom Torlakson
Karen Stapf Walters, Executive Director, State Board of Education
Patricia De Cos, Deputy Director, State Board of Education
Cathy McBride, Office of the Governor

Comments received after August 25, 2014

Comment #130

From: Will Parish [mailto:wparish@tenstrands.org]
Sent: Wednesday, August 27, 2014 7:23 AM
To: Tom Torlakson
Cc: Lupita Cortez Alcala; Tom Adams; Megan Ellis
Subject: NGSS - Public Comment

Formal Letter from Ten Strands

Date: August 25, 2014

The Honorable Tom Torlakson
State Superintendent of Public Instruction
California Department of Education
1430 N Street

Sacramento, CA 95814

Dear Superintendent Torlakson,

First, I want to thank you for getting the Environmental Literacy Task Force (ELTF) off the ground. I think it stands to fundamentally reshape the way environmental literacy is achieved throughout the state. Also, your history of supporting science education deserves mention.

I want to register my support for the Next Generation Science Standards (NGSS) final implementation plan to make specific reference to California's legislated (AB 1548, the EEI) environmental principles and concepts (*EP&Cs*) that were developed pursuant to PRC Sec.71301. Including the EP&Cs into the revision of the California Science Curriculum Framework, while also including them in the NGSS rollout, would be consistent with the goals of the Framework revision.

In addition, including the EP&Cs as part of the NGSS rollout would dovetail nicely alongside the wave of interest in the Education and the Environment (EEI) Model Curriculum that we are seeing across the state.

There is mounting evidence to support the idea that students tend to be more engaged when subjects are taught using the environment as a context. While the environment is referenced in several places of the NGSS drafts that I have seen, the actual incorporation of the EP&Cs would fully align the implementation of AB 1548 and improve student outcomes at the same time.

Please let me know how I can be of further assistance than my current involvement with your department. I look forward to continued collaboration with the California Department of Education and to working with the ELTF, all in pursuit of improved student academic outcomes, great environmental literacy for all, and wonderful preparation for a higher education path or a technical career path.

All the best,
/s/
Will Parish, Executive Director
Ten Strands