July 3, 2013

State Board of Education

1430 N Street, Room 5111

Sacramento, CA 95814

Distinguished School Board Members,

I am writing to you today with specific concerns about the implications to middle school students with regard to item number #02 on your board agenda.

My name is Emily Williams, in August I will begin my 15th year teaching 7th Grade Science in California. I have eagerly awaited each discussion and draft of the Next Generation Science Standards (NGSS) because I have been hopeful that they will bring the rigor, depth, and coherent Science content that the current 1998 adopted State Science Standards have been lacking. I have been a part of multiple Los Angeles County and state review workshops. I have helped evaluate the NGSS in each stage of the draft reviews. In all of the discussions at the county and state conferences there seemed to be an understanding that the Earth Science, Life Science, and Physical Science Standards would all be domain specific and the grade span would be kept together at the 6th, 7th, and 8th grade levels respectively. When I saw that the proposed 6th, 7th, and 8th grade break down had finally been released but that the content standards had been scrambled into bits and pieces across three different grades I was in utter disbelief.

Middle school is often the first time California students receive a dedicated, focused, and consistent Science education. In some districts middle school consists of sixth through eighth grades while in others it is only seventh and eighth, or even seventh through ninth grades together. During middle school, science moves from a fun activity done during a separate activity time once a week as in elementary school, to a daily endeavor to understand and make sense of the surrounding world. Because of the increased frequency of classes and more aggressive approach to integrating science into our curriculum, this need for consistent and linear storytelling becomes vital to the students’ ability to understand and embrace the content. We know that the implementation process for the Common Core and the NGSS will be scaffolded but if you decide to scatter the concepts across the years you may be hindering the educators in a way that you may not realize.

I know that the Science Expert Panel (SEP) was given the specific directive to link the NGSS to the Common Core but I believe the approach of scattering the standards is misguided. As a practical example I suggest we look at the Middle School Life Science Standard 3 Heredity: Inheritance and Variation of Traits.

This content was reviewed by 7th grade life science teachers but in the proposed conceptual progressions model the second part of the genetics standard is being taught in the 6th grade.

*MS-LS3-2: MS-LS3-2. - Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. [Clarification Statement: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.]*

Then two years later, when the students are in 8th grade, they learn the rest of the standard.

*MS-LS3-1. - Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. [Clarification Statement: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.] [Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.]*

This “progressions model” removes the 7th grade “Life Science” teachers, who have been teaching heredity for at least the last 15 years, out of the instructional process entirely*.*

Are we truly pulling heredity and genetics, apart just because we think punnett squares are a good way to reinforce statistics & probability? This is like pulling US History into sections and saying you will learn about the Constitution in 6th grade because the 6th graders are learning how to write persuasive arguments. Then we will teach about the Bill of Rights in 8th grade because that is when the students add more support and evidence to their written arguments. That would make no sense, just as pulling apart the middle school Science content is not the way to accomplish cross-curricular integration; it needs to come naturally and logically from the teams of teachers at each school site who are experts in making content relevant to their students.

Page 4 of your agenda explains the thinking behind the K-5, 6-8 & 9-12 learning progressions. I argue that the justification for keeping high school as domain specific grade spans is relevant for middle school as well. The SEP recommends that the learning progression:

***be arranged as a grade span, 9–12, to allow local districts maximum flexibility in designing their high school curriculum such that all students have the opportunity to learn all standards.***

On page 12 of your board agenda it states that:

*Three model course maps are presented:*

1. *Conceptual Progressions Model (grades 6–8 and 9–12)*

*This model maps PEs into courses based on what concepts are needed for support without focusing on keeping disciplines separate.*

1. *Science Domains Model (grades 6–8 and 9–12)*

*The grade banded PEs are organized into content-specific courses that match the three science domains of the Framework: Physical Science, Life Science, and Earth and Space Science.*

1. *Modified Science Domains Model (grades 9–12)*

*The 9–12 grade band performance expectations are organized into content-specific courses that match a common high school course sequence of biology, chemistry, and physics. To ensure all students have access to all standards, the PEs connected to the Earth and Space Science domain of the Framework are divided among these courses.*

I believe that option 2, the **Science Domains Model** for 6-8 as well as 9-12 will allow teachers to best meet the needs of their students.

I hope that you will seek input from middle school teachers across California who up until this point have been discussing the standards in collaborative groups by domain. The board agenda outlines the many opportunities teachers have had to give their opinion and suggestions but in the two NGSS focus group discussions I attended the scattering of the standards was never mentioned. Specifically on May 29, 2012, South Pasadena Middle School hosted a LA County review discussion and at the October 2012 California State Science Teacher’s Convention in San Jose teams of teachers met to review the standards and the first thing that each of the presenters had us do was to break up into domains to discuss pros and cons to the specific domains we were most familiar with. There was NEVER a discussion on, “Why don’t you pick and choose a standard from any domain you like that you think might be good for 6th graders.”

I urge you to please reconsider the splitting and scattering of the Earth, Life, and Physical Science Standards across the grade levels. Let the middle school teachers in California have a voice in the age appropriateness and breakdown of what content should be taught and when. Because this proposed reallocation of standards by grade level is being done during the summer it hasn’t been seen by most middle school teachers. Let us tell the story of the sciences: the story of the earth, the story of living systems, and the story of the physical world in a cohesive and organized manner. As middle school teachers we are trying to help students put together a complex puzzle of information and allow them to see the whole picture. This tearing apart of the sciences is like hiding pieces of the puzzle for a year or more as we try and help the students construct meaning. Additionally, because every district has a different break down of the “middle school“ model, if 6th grade is left at the elementary level and not in middle school you may be literally tossing away crucial pieces of the puzzle that the students may never get. Please let middle school teachers tell the whole story and set our students up for success.

Sincerely,

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