MINUTES
SCIENCE STANDARDS RECOMMENDATION COMMITTEE
MAY 26, 2016

The Standards Recommendation Committee met for its third scheduled meeting at the Tennessee School Boards Association office at 8:30 am CDT.

Present……10 **Absent…….0**
Ms. Jan Allen Brewer
Ms. Marsha Buck
Ms. Jeannie Cuervo (Vice Chair)
Dr. Kent Gallaher
Ms. Lorrie Graves
Ms. Annette Hurd
Ms. Kattie Nash
Dr. Sally Pardue (Chair)
Ms. LaToya Pugh
Mr. Mark Weeks

8:35 AM
Dr. Sally Pardue called the meeting to order. She asked **Ms. Laura Encalade** to introduce anyone in the room that the committee has not already met.

Dr. Pardue asked for a motion to approve the agenda.
ACTION: **Dr. Gallaher** moved acceptance. **Ms. Hurd** seconded. The motion passed unanimously.

Dr. Pardue asked for a motion to review and approve the minutes.
ACTION: **Mr. Weeks** moved acceptance. **Ms. Buck** seconded. The motion passed unanimously.

Ms. Encalade gave a recap of the April 7th meeting. The committee members described the progress of their outreach concerning the public review website.

Ms. Encalade continued the recap of the April meeting by discussing the presentation from the educator team leads. **Dr. Pardue** asked for clarification if the committee will get a document that specifies total change. **Ms. Encalade** said that they have not aggregated the documents beyond the change tracking documents.

Ms. Cuervo said that the reviewers did take a lot of time to review the standards and that their comments were thoughtful.

Ms. Encalade moved to introducing the feedback reports section on the agenda. **Ms. Cuervo** asked for clarification on the timeline of the process for math and ELA and where they are in the equivalent process. **Ms. Encalade** explained the structure of the math/ELA SRC meetings when they were drafting their recommendations and position statement that was presented to the State Board.

Dr. Pardue said to remember that in the open discussion this afternoon, it would be useful to tag references to the standards they are discussing. She said she anticipated that the committee will likely have a position statement. She said to make note of what would be useful in a position statement and discuss that at next week's meeting.

Ms. Marsha Buck asked how the writing team would work to incorporate their recommendations into the standards. **Ms. Encalade** said it would depend on the substance of their recommendations.

9:00 AM
Ms. Encalade began the presentation on the feedback reports. The State Board staff worked to gather feedback from the higher education community, a series of roundtables, presented at the NSTA conference, the public website, and SREB's report.

Ms. Encalade and Mr. Ari Goldstein began with the higher education feedback report. **Ms. Encalade** explained the review structure for the higher education review committee. They were broken up into grade or course bands. The reviewers left very detailed feedback on the review.

Mr. Goldstein started his part of the presentation with some key notes on the four focus areas. 12 out of 16 responses agree that the format of the standards was easy to follow or very easy to follow. There were a few outstanding questions regarding format such as double-coding standards or emphasis on crosscutting concepts. They wanted to see a more visual representation on the crosscutting concepts.

In the introductions, 10 out of 16 identified the introductions as clearly written but only half identified the introductions as definitely or for the most part useful. There were concerns about repetitiveness particularly in high school. Reviewers noted that there are thematic goals for K-8 but not in high school.

With respect to clarity, 13 out of 16 agreed that the standards are clear or had greatly improved in clarity. Similarly, 12 out of 16 responses agreed that rigor was just right.

Mr. Goldstein explained several areas of strengths such as the formatting and coding as well as several areas of improvements such as the utility of introductions.

Mr. Goldstein moved to discussing specific feedback received in grades k-5. Outstanding questions included how to explain to students what science is. The physical science standards were really well received. One major outstanding question for life sciences was to incorporate strategies for emphasizing scientific method or practices. These reviewers did not walk away with a clear understanding of how those procedures were supposed to be implemented in the classroom.

Ms. Cuervo said that she thinks this is extremely helpful information. It is helpful to have the outside feedback coming in and specifically due to the introductions. The teacher will not see the repetitive nature of the introductions because they are only going to look at their course. I think it is critical that we make things explicit such as putting the crosscutting words in bold in the standards.

Ms. Brewer asked if we know the percentage of change of comments compared to the current standards that teachers are using. **Ms. Encalade** said that the standards that were put up on the

public website were a complete rewrite. **Andy Hebert** explained that the content is not going to change as significantly. For example, there is a lot that is similar in biology.

Dr. Pardue said that there is some introductory material that we can look back to that discusses the change and the rewrite standards. **Ms. LaToya Pugh** explained how we are going to have to make it clear the shift in resources to actually do science rather than regurgitating facts. **Dr. Gallaher** thinks that we should adopt the idea that science is not just a body of content but something that is a process.

Dr. Pardue said that it is a capture point for the recommendations – an editorial to flip the sentence. The sentence goes on to explain that and it would be an example of a recommendation. Recommend a soft addition to the agenda to have a discussion of the introductory material.

Ms. Lorrie Graves said that it is important to have a graphic that is easy to see that explains the difference in grade brands to showcase the vertical alignment. **Ms. Marsha Buck** said that she got that question over and over. People want to see the total flow from K-12 in a graphic.

Ms. Pugh asked if creating that graphic is a district job or the job of the committee? **Ms. Encalade** said that we could put together the graphic just based on the standards but districts can go into each grade level and create that for the curriculum. The sequencing of the actual standards in a course is where the districts would come in.

Dr. Pardue thought this was a fantastic report and gave a sense of the depth of feedback that higher education folks were able to offer.

9:35 AM
Ms. Erin Conley presented on the SREB report. There were two reviewers who looked at the standards as a stand alone document. The reviewers were still looking for the same focus areas: rigor, coherence, clarity, and format. To make work easier, split the standards into K-8 and high school. The feedback was very similar but different than what the higher education folks said.

Ms. Conley explained several areas of strengths the reviewers identified in the standards as well as high-level suggestions for revisions on the K-8 standards as a whole.

Ms. Conley then presented on several areas of strength identified in the high school standards such as the research course that builds in scientific inquiry. Reviewers also identified suggestions for revisions such as if possible, attempt to decrease number of standards while maintaining balance.

Dr. Pardue asked for clarification regarding wording in the report, such as science curriculum rather than the standards as well as when the reviewers mentioned too many standards, would like more clarification or specifics if possible. **Ms. Encalade** and **Ms. Conley** noted the changes to make.

Dr. Gallaher asked **Andy Hebert** for clarification about the engineering standards and ETS standards. **Andy Hebert** explained how they came to their decision to include specific engineering standards as well as the ETS standards. But ultimately, it is up to the committee if they think there are too many standards.

Ms. Cuervo said that part of what the reviewers are noticing is with the high school life science, ETS is specifically there. But in chemistry 1 or 2 or physics, the specific ETS standards are not detailed out. She wondered if that is what the reviewers are noticing.

Dr. Pardue explained that she likes the explicitness in some aspects but that there is a danger of losing the implicit connections such as natural engineering connections. **Andy Hebert** explained that one of the problems they ran into with picking a specific engineering that lend itself in connection with life science, became a challenge to identify which engineering standards are important enough as stand alone.

9:45 AM

Ms. Cummins presented the findings of regional roundtables. She explained that the regional roundtables are intended to help provide even more feedback by region and ensure representation of grassroots perspectives. She explained the structure of the roundtable sessions, which were separated into sessions for educators and parents. Educators were able to focus on individual content or grade bands, whereas parent groups discussed the standards holistically.

Ms. Cummins presented the survey data from the regional roundtables. 96 total participants were surveyed, with 87% finding the format/structure of the standards was easy or very easy to follow. 78% thought the level of rigor in the standards was just right. 59% thought the standards are greatly improved or clear. 28% were neutral on clarity of standards. 53% identified coherence as strong, and 38% neutral.

Ms. Cummins discussed overall trends from the regional roundtable discussions. She noted that educators consistently asked for more supplemental documents and more examples to help add clarity to the standards. She added that some comments suggested rigor to be too high, but that Educators and parents were very appreciative of the opportunity to be involved in the review process.

Ms. Cummins then presented the trends from grade levels and content areas. In grades K-5, reviewers were positive, but slightly concerned about rigor in grades K-2. In middle grades, some educators wished to see a greater focus on STEM practices, as well as some questions about the use of scientific vocabulary. Middle grade teachers were also interested in more guidance around assessment of standards. High school educators were also eager for additional resources.

Ms. Brewer requested more information about which counties participated in the regional roundtables.

Ms. Encalade offered to provide a county by county breakdown of the participants.

Dr. Gallagher is concerned that some teachers are expressing a desire to see terminology removed due to insufficient understandings of those terms. He also noted that clarity was a significant theme within the Murfreesboro roundtable.

Dr. Purdue suggested that supporting documents also proceed through a roundtable review process.

Ms. Cummins then moved to discuss feedback from the NSTA conference held on Friday, April 1st. At the conference, SBE held three sessions segregated by grade level (elementary, middle, high school). Presentations were intended to inform participants about the review process. 44 attendees completed a survey about the standards, where they evaluated the standards' rigor, relevance, and clarity.

Response trends suggest varying opinions about rigor and clarity, and that grades 6-8 were most variable. **Ms. Cummins** noted that complete text of response data is available in provided reports.

10:45 AM
Ms. Encalade began presentation on the public feedback website for the April 5 – May 13 review time period. She thanked the committee for their work in outreach about the website. Gave an overview of the feedback data analytics to the committee.

Ms. Encalade then moved to key trends as seen in the feedback. For example, she explained that there was a trend for concerns about implementation and making sure there is time to devote to the standards in the classroom. There was also a trend to see a visual of the vertical alignment and clearly identifying the key concepts. There is a mixture of concern and support in the content sequencing in the middle grades. She also noted that there was trend of concern about the number of standards and the ability to teach to the depth of the standard particularly in physical science, biology and chemistry. She made sure to mention that these are trends that she found in the data and hoped it was helpful but if they had other thoughts that was great too.

Dr. Pardue said to take just a minute or two to get down any burning thoughts or questions before they take a break.

10:50 AM
The committee breaks up into grade bands (K-5, 6-8, and 9-12) to discuss the feedback reports and public comment in depth.

12:30 PM
Dr. Pardue asked the group to share nature of table conversations for about 10 minutes. **Ms. Kattie Nash** said the K-5 group's concerns were mostly in the verbiage. The content is good, but questions are consistent re: wording.
Ms. Cuervo asked what the confusion is—about framework?

Ms. Graves said it's about specificity through examples. Gave a few example standards that are missing clarity.

Ms. Pugh looked at 4th grade. Most questions were clarity. What does this mean, what is it asking us to do?

Dr. Pardue asked if group might be able to offer approaches for writers to take to address issues?

Ms. Nash said they are headed that way.

Ms. Graves said they understand and appreciate broadness of standards, but at the same time concern lies with where the testing falls. Specificity is important for that.

Ms. Nash said there were 8 standards with 13 review/removes. More opinions of developmental inappropriateness. Shouldn't necessarily revise or change that. Expectations are different for different teachers. Some of this deals with personal opinion, not standards.

Ms. Jan Brewer said some standards are too broad, vague without supporting document to specify.

Dr. Pardue asked for comments from 6-8.

Ms. Buck said the group is looking at "hotspots," looking carefully and taking comments into perspective. Then making notes, keeping in mind number of people who said "keep". Maybe something that a supplemental document could take care of—take note and move on.

Dr. Pardue said the group spent a lot of discussion time on the type of comment.

Ms. Buck discussed clarification—teachers want clarification. There's a lot of movement, shift. Is this pushback because "I've always taught 7th grade rocks and minerals" or is this a legitimate concern about the standards?

Dr. Pardue mentioned higher education chart, and how it's broken down of review comments falling into different categories. What does "research" mean?

Mr. Weeks asked about the foundational model the standards were based on—are the scope and sequence similar?

Ms. Cuervo explained by the end of __ grade, __ grade, etc.

Mr. Weeks said there are questions in chemistry saying something should be taught in chemistry II or an honors level class.

Dr. Pardue said that comment questions longitudinal placement—go back to framework document and see what it says. It is a directive document for all students. What else went on?

Ms. Pugh asked if clarity can be increased in the introductions? For example, what models are. It doesn't really explain what a model is. Can this be added into the introductions?

Ms. Cuervo said she thinks a lot of what is being discussed is in the supporting document. Asked Ms. Encalade to share that with the group.

Ms. Encalade said she thinks it's helpful to share what the document looks like to answer clarity questions. Also, she said that they can recommend that certain things be included in the supporting document.

Ms. Hurd mentioned the level of rigor—don't want to water down the standards, we want to keep them high.

Ms. Buck said it's a balance to find what is appropriate without watering it down. A few years ago, test scores were high but it was because standards were low. Providing most rigorous

standards is best for students, but needs to balanced with what is appropriate for certain grade level.

12:45 PM

Ms. Nash said it's the same for younger grades. They want things moved to a higher grade level, but that can't be done because of the progression. We can't cut or revise everything or standards will be watered down. Standards for early elementary are great.

Mr. Weeks said HS group discussed supporting documents. Noted a number of times comments said chemistry I should be chemistry II standards. Otherwise well received.

Ms. Cuervo put together an overall list of trends. Then just put down specific standards to revisit per each course. I think the standards are awesome. Having worked on it, you'll never feel like it's good enough. You have to take into account how many people support it, and balance that with knowing something will never be perfect.

Dr. Pardue said 6-8 table echoed Ms. Encalade and Ms. Pugh in targeting specificity to allow measurability. Ask herself does each standard have specificity so that it is measurable? Picked a hotspot, 7th grade. Invite them to go back and work for another hour. She had no process in mind other than 6-8 level—identify top 10 standards that need another look. Might be different for other grades.

Ms. Cuervo said it is different because of specific courses.

Ms. Brewer asked if it is possible to keep working and place categories of concern between now and next meeting.

Dr. Pardue said they can work individually, but only communicate with each other at these meetings.

Ms. Cuervo asked if today they need to have specific recommendations done, or next week?

Ms. Encalade said getting a general idea of recommendations today, and then the SBE staff will draft the document, bring it back next week and get it finalized.

Ms. Cuervo asked if by the end of next meeting we have a typed up document of the recommendations and the position statement?

Ms. Encalade said yes on recommendations, not necessarily on position statement.

Mr. Weeks clarified how they would write the recommendations.

Ms. Encalade said there is no set way they have to look. She mentioned the math/ELA template, but they can do it differently—more or less specific, it's up to them. Idea of having overall categories and groups of standards underneath might be most helpful.

Ms. Brewer asks if they can access supporting document before standards draft finalized?

Ms. Encalade said yes, they can see the rough draft.

Ms. Cuervo understands that the supporting document can sidetrack them—only looking at it to see how it addresses questions/concerns. The SRC isn't working on that document, only standards. **Ms. Encalade** reiterated yes, they should work on standards only.

1:00 PM
Dr. Pardue dismissed the groups to work individually for an hour.

2:10 PM
Dr. Pardue reconvened the group. Asked 9-12 group to recap. **Ms. Cuervo** says they looked at general things across the board but so far the Chemistry I is the main hotspot that should be looked at.

Mr. Weeks wrote down some vocabulary stuff that popped out throughout the courses.

Ms. Cuervo said that a lot of their trends can be taken care of in the supporting document. Some issue is educators needing materials—can visit the document to see options for equipment and options for experiments. With wording, there's not quite an understanding by some of the framework terminology. For example, the need to clarify what models can be. Course sequencing is a big issue in HS. We are not making recommendations on this. We can make a statement, but not address. There was the issue of the ETS standards where life science is specified but physical science did not. We need to at least make a statement on, or make all or none have it. Went through individual courses as well.

Ms. Pugh asked about sequencing. Will districts get standards in time to prepare sequencing?

Dr. Pardue asked Ms. Encalade to clarify timeline.

Ms. Encalade confirmed that standards will go into effect in 2018-2019.

Ms. Pugh stated that during the mean time is when PD should occur and teachers should dive into the standards.

Dr. Pardue discussed grant-funded PD exposing teachers to the framework (at present).

Ms. Hurd asked about textbook contracts. Will this help teachers?

Ms. Encalade responded that the adoption cycle nicely aligns with standards adoption. Standards should be finalized in October, then textbook publishers will get access to them. They'll spend time developing textbooks then present them to the state. Gives districts time to select and buy books.

Dr. Pardue asked the middle school table for thoughts.

Dr. Gallaher said the group looked at higher education recommendations to see if they aligned with public comment.

Dr. Pardue said they've found a pattern of discussion and have created a soft categorization of standard concerns. Asked how it's going in K-5 group.

Ms. Pugh said that all around, the clarity piece is the issue. Teachers want examples. But, will that limit teachers? Don't want them to only focus on those examples, but also want freedom to

choose their own. Some 4th grade feedback was to move standards to 3rd and 5th grade. There is one 4th grade standard that she has no clue what it means, but otherwise, clarity, examples, and defining models will resolve most issues. She agreed with Ms. Nash that the standards are well-written.

Ms. Brewer looked at 5th grade and saw the same thing. Part of the problem is understanding the standard, with teachers who need professional development to improve/update content knowledge. We might have to simplify a few of these. Maybe we can help the writers to see the issues and the supporting document will address those problems. There is going to be a lot of work at the school level for acceptance and empowerment of the standards.

Dr. Pardue asked about possibility of having a year in which the standards are implemented without an assessment. Or, a no stakes assessment.

Ms. Encalade said Dr. Tammy Shelton could better address this question. Ms. Encalade does know that we do have some federal requirements for accountability and assessments.

Ms. Brewer said in their statement they might want to suggest allowing flexibility on assessment.

Ms. Buck said it is tougher in science. Last time around, test scores dropped with new standards.

Ms. Chastain said there has been a grace period for TNReady, including science. There is more flexibility with ESSA. So far as scores going down, teachers are setting those cut scores—that process of setting "advanced," "proficient," etc. is a separate process coming down the road.

Ms. Graves asked what grades must be assessed.

Ms. Encalade said 3rd, 8th, and one high school assessment for science.

Ms. Encalade said conversations are ongoing for stakeholder engagement on ESSA. Discussing accountability systems, assessment, etc. Opportunities to provide public feedback. Doing a statewide listening tour. With the transition in TNReady, there was flexibility built into statute. No firm decisions have been made yet for 2018-2019 science testing.

Ms. Buck said that her teachers assume that the science test will change to be more like constructive response.

Ms. Chastain said there is no plan for science to have constructed response. There will be different item types, different ways to have models, drag and drop, etc. Technology will increase.

Ms. Buck thought that in "developing an argument" (language from standards) they assumed that there would have to be a constructed response. Group questions how that might be assessed.

Dr. Pardue tied in ETS in middle grades. She wonders how "designing" something would be tested.

Ms. Chastain said that Ms. Shelton spoke to the writers at the last science session for how to deal with those verbs. She reminded the group that we shouldn't be deciding this stuff based on

assessments. Be conscious of what good science is and what will happen in the classrooms, not too focused on what those assessment items will look like.

Ms. Cuervo said that this committee needs to be focused on developing the best science standards for their students. Frankly, the assessment piece is someone else's work—we are just responsible for standards.

Ms. Purdue is concerned that a teacher may not be able to formatively assess a student's ability to meet a learning objective.

Ms. Cuervo agreed with that.

Ms. Graves wondered if the lower grade levels will have "I can" statements.

Ms. Encalade said as is, there will be standard, examples, and scope and clarifications. There is no translation into "I can" statements. That is more done at the district level.

Ms. Chastain said that could help clarify what the standards look like, though.

Ms. Graves said those "I can" statements could look vastly different across the state, which is concerning. Wants there to be uniform set of statements students can understand.

Mr. Weeks mentioned that some students have access to high-technology labs, while others struggle to find construction paper. But it goes back to them all taking the same test.

Ms. Chastain said there is an entirely separate review process with teachers to make sure that they consider different student needs across the state, to equitably measure progress of all students. Doesn't want the fear of the assessment item to drive what good science education looks like.

Ms. Brewer asked who is responsible for creation of the assessment.

Ms. Chastain said the TDOE drives that, in collaboration with vendors and experts.

Ms. Buck said they discussed wanting standard to be measured.

Dr. Sara Heyburn said that the board will review a lot of that, but the TDOE drives the work. She told the committee to be less concerned about how it is measured.

Ms. Buck said in her classroom, she might measure those things with constructed response.

Dr. Pardue replied that the committee might include these thoughts in their position statement.

2:40 PM
Dr. Pardue thinks this is incredibly useful dialogue. There is time this afternoon to break out again and then share back with the group.

Ms. Cuervo asked about what Ms. Encalade and the SBE staff will need in order to craft recommendations.

Ms. Encalade said she is taking notes and seeing trends. Reporting out at the end would be helpful. She also asked the groups to send notes (written, email, soft copy). Then we will work to bring it back to the group.

2:45 PM
Dr. Pardue concluded the whole group and split into small groups again.

3:55 PM
Dr. Pardue reconvened the group. They initiated a discussion of how to compile the recommendations.

Dr. Gallaher said that they saw some reoccurring sloppiness so far as language—room to tighten up so that it's clear what the student needs to know. Make sure it is the same language reflected in the "north star" document.

Dr. Pardue agreed on moving toward a consistency of language. Her group took the higher education feedback and looked for correlation for public commentary.

Ms. Cuervo said her group will email Ms. Encalade their comments. They have general comments (across the board) then they split comments into each high school course, some of which didn't have any comments. They listed some standards that the writing team should specifically revisit.

Ms. Pugh said they will send their documents for each grade to Laura. Some overall trends would be inclusion of a vertical alignment document. Need to revise verbiage, defining vocabulary and provide examples. And five or six standards to reconstruct or delete. Grade specific details will come by email.

4:00 PM
Ms. Pugh wanted to ask about the resources and supporting document; she doesn't think we are charged with that task, nor is the writing committee. Is this a district-level responsibility?

Ms. Encalade said a parallel of this is in the social studies, where primary source documents are required but are not open source—districts have to go buy them. We don't want it to require or dictate that teachers must obtain/buy certain materials. She said the intent is for everyone to be able to implement the standards. There is room in the position statement to suggest that districts adopt resources, but no recruitment.

Dr. Pardue said that this could be a living document, something TSTA could get involved in. This also fringes on curriculum.

Ms. Encalade said that for any resource or curricular document, we'd have to go through the textbook commission.

4:05 PM
Dr. Pardue said today has been very productive and she celebrated the committee's work. She recapped that they will reconvene next Thursday.

Ms. Encalade asked that everyone send her their notes ASAP. We will have something to committee members at least as of the day before the meeting. Hopefully get something out by Tuesday or Wednesday. Please know this is our first cut at it and can be changed from there.

Dr. Pardue asked for a motion to dismiss.

ACTION: **Ms. Graves** moved acceptance. **Ms. Cuervo** seconded. The motion passed unanimously.